

Norfolk Boreas Offshore Wind Farm

Appendix 17.4

Norfolk Vanguard Marine Archaeological Technical Report *As produced for Norfolk Vanguard*

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Norfolk Vanguard Offshore Wind Farm

Marine Archaeological Technical Report

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Norfolk Vanguard Offshore Wind Farm

Marine Archaeological Technical Report

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Wreck Sheets

Sheet 1: WA ID **70021** - Unknown
Sheet 2: WA ID **70255** - Unknown
Sheet 3: WA ID **70262** - Unknown
Sheet 4: WA ID **71334** - Unknown
Sheet 5: WA ID **70342** - *Golden Oriole* (possibly)
Sheet 6: WA ID **70360** - HMS *Dunoon* (possibly)
Sheet 7: WA ID **70459** - *Phillipp M*
Sheet 8: WA ID **70565** - Unknown
Sheet 9: WA ID **70617** - *Rye*
Sheet 10: WA ID **70639** - *Trevethoe*
Sheet 11: WA ID **70645** - Unknown
Sheet 12: WA ID **70659** - Unknown
Sheet 13: WA ID **70704** - Unknown
Sheet 14: WA ID **70709** - *Montferland*
Sheet 15: WA ID **70744** - Unknown
Sheet 16: WA ID **70809** - *Seagull*
Sheet 17: WA ID **70834** - *Xanthe*
Sheet 18: WA ID **70934** - *Sheaf Water*
Sheet 19: WA ID **70954** - Unknown
Sheet 20: WA ID **70962** - *Fulgens*
Sheet 21: WA ID **71043** - Unknown
Sheet 22: WA ID **71117** - HMS *Francolin*
Sheet 23: WA ID **71128** - Unknown
Sheet 24: WA ID **71129** - HMS *Dungeness*
Sheet 25: WA ID **71131** - Unknown
Sheet 26: WA ID **71162** - Unknown
Sheet 27: WA ID **71172** - Unknown
Sheet 28: WA ID **71176** - Unknown
Sheet 29: WA ID **71181** - Unknown
Sheet 30: WA ID **71188** - *Ole Bull*



Norfolk Vanguard Offshore Wind Farm

Marine Archaeological Technical Report

Summary

Wessex Archaeology was commissioned by Royal HaskoningDHV on behalf of Norfolk Vanguard Ltd to prepare a Marine Archaeological Technical Report, including a high level Environmental Appraisal, that will in turn inform an Environmental Impact Assessment (EIA) and subsequent Environmental Statement (ES), for the offshore elements of the proposed Norfolk Vanguard Offshore Wind Farm project and provisional offshore cable corridor.

The proposed project, Norfolk Vanguard, comprises two distinct array areas, Norfolk Vanguard East and West, along with a provisional offshore cable corridor linking the two arrays, which extends to the coast of Norfolk. The two areas are approximately 89km and 45km from the coast, respectively, and the proposed cable corridor would be 95km long.

The Technical Report comprises:

- *Relevant legislation and guidance;*
- *A methodology;*
- *An archaeological baseline study informed by an archaeological assessment of geophysical data, geotechnical samples and relevant documentary archives;*
- *An assessment of the setting, value and sensitivity of the assets identified within the assessed area; and*
- *A high level Environmental Appraisal.*

The archaeological resource within the study area are summarised as follows:

- *A total of 171 features of palaeogeographic potential (18 in Norfolk Vanguard East, 110 in Norfolk Vanguard West, and 43 in the provisional offshore cable corridor);*
- *Potential for discovery of sites and artefacts from the Palaeolithic to the Mesolithic periods across all the project areas;*
- *A total of 318 individual geophysical anomalies of possible archaeological potential within Norfolk Vanguard East, four considered to be of high archaeological potential (A1), all of which are identified as wrecks;*
- *A total of 184 individual geophysical anomalies of possible archaeological potential within Norfolk Vanguard West, eleven considered to be of high archaeological potential (A1), one of which is identified as a wreck;*
- *A total of 973 individual geophysical anomalies of possible archaeological potential within the provisional offshore cable corridor, thirty-seven considered to be of high archaeological potential (A1); twenty-six identified as wrecks;*
- *Potential for the discovery of further shipwreck material from the late Mesolithic to the present;*



- *No known aircraft crash sites; however, there is the potential for the discovery of 20th century aircraft material, particularly from World War II;*
- *A total of 65 records located within the intertidal zone of the provisional offshore cable corridor (from Bacton Green to Happisburgh South), and the potential to uncover further remains in this area, particularly dating to the prehistoric periods or much more modern World War I and II related infrastructure;*
- *Several onshore and offshore assets that have an important aspect of setting when considered within the World War I and World War II military landscape and seascape of the region; and*
- *The Historic Seascape Character of the area comprises: fishing (including fishing grounds and fishing activities), military (military defence and fortification), industry (gas supply pipeline and aggregate dredging), communications (submarine telecommunication cables), navigation (navigation routes), cultural topography (including sandbanks with sand waves) and coastal infrastructure (flood and erosion defences).*



Norfolk Vanguard Offshore Wind Farm

Marine Archaeological Technical Report

Acknowledgements

This project was commissioned by Royal HaskoningDHV, on behalf of Norfolk Vanguard Ltd, and Wessex Archaeology is grateful to Gemma Keenan and Victoria Cooper in this respect.

Wessex Archaeology would like to thank the National Record of the Historic Environment for supplying sites and monuments data, the United Kingdom Hydrographic Office for supplying the known wreck and obstruction data, and Norfolk County Council for supplying the corresponding Historic Environment Record data. Geophysical data was provided by Vattenfall and geotechnical sample data was provided by Fugro Geoconsulting, both of which are gratefully acknowledged.

The report was compiled by Victoria Lambert and Stephanie Said, with contributions from Abby Mynett, Megan Metcalfe, Stephanie Arnott and David Howell. The figures were prepared by Kitty Foster. Dr Dan Atkinson managed the project on behalf of Wessex Archaeology. Quality assurance was provided by Dr Stephanie Arnott, Dr Louise Tizzard, and Dr Dan Atkinson.



Norfolk Vanguard Offshore Wind Farm

Marine Archaeological Technical Report

1 INTRODUCTION

1.1 Project Background

- 1.1.1 Wessex Archaeology was commissioned by Royal HaskoningDHV, on behalf of Norfolk Vanguard Ltd, to prepare a marine archaeological Technical Report including a high level Environmental Appraisal for the three offshore elements of the proposed Norfolk Vanguard Offshore Wind Farm (hereafter referred to as the 'project'). The elements comprise Norfolk Vanguard West (NV West), Norfolk Vanguard East (NV East), and the provisional offshore cable corridor (OCC). This assessment will in turn inform the Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES).
- 1.1.2 At their closest points, NV West is located 47km from the Norfolk coastline and NV East is located 89km offshore from Bacton, Norfolk. The provisional cable corridor links the two arrays and will be connected by offshore export cables to the proposed landfall (at the time of writing, the landfall search zone is from Bacton Green to Happisburgh South). The proposed cable corridor will be approximately 95km long.
- 1.1.3 This report comprises a marine archaeological baseline study of the project area, based on an archaeological assessment of geophysical and geotechnical data, gathered as part of offshore site and cable route surveys, together with a review of records held by national and local inventories and secondary sources relating to the marine and intertidal historic environment of the region. This archeological baseline also includes an assessment of the value and sensitivity of any identified marine or intertidal archaeological assets within the project area, along with an assessment of their setting. An assessment of the seascape character will also be undertaken.
- 1.1.4 Prior to this assessment, other works have been undertaken in the area. Initially, the current project fell under the 'East Anglia Zone' which was awarded to the joint venture company East Anglia Offshore Wind (EAOW) Ltd by The Crown Estate in 2009. In 2011, Wessex Archaeology was commissioned by Environmental Resources Management (ERM) to conduct a Zonal Environmental Assessment (ZEA) on behalf of EAOW. However, in 2014 a decision was taken to split the zone, with Vattenfall Wind Power Ltd (VWPL) having development rights within the north of the former East Anglia Zone, and ScottishPower Renewables (UK) Limited (SPR) continuing to develop the southern part.
- 1.1.5 Norfolk Vanguard Ltd, an affiliate company of VWPL is now undertaking the EIA for Norfolk Vanguard. NV East includes the former East Anglia FOUR area with a slightly revised boundary. A Scoping Report for East Anglia FOUR was submitted in 2012 under the former Zone Development Agreement (ZDA; EAOW, 2012).
- 1.1.6 In 2016 Wessex Archaeology was commissioned by Royal HaskoningDHV on behalf of VWPL to provide a report summarising the archaeological assessment of geophysical data undertaken to date with reference to Norfolk Vanguard. This consisted of NV West,



NV East and the provisional OCC. A geophysical survey of NV East was undertaken in 2012 as part of the East Anglia FOUR proposal, whilst the remaining elements of Norfolk Vanguard were surveyed in 2016.

1.2 Development Proposal

1.2.1 The proposed offshore wind farm would consist of between 90 and 257 wind turbines, each having a rated capacity of between 7 and 20MW, with a total installed capacity of up to 1,800MW (Royal HaskoningDHV, 2017). The location of the turbines will be finalised pre-construction, however the maximum capacity that may be located within NV West is 100%, and within NV East is estimated to be 67%. The export cable length would be approximately 110km for NV East and 100km for NV West, and at the time of writing, three potential landfall locations have been proposed – Bacton Green, Walcott Gap and Happisburgh South. The selection will depend upon the initial survey and data collected for the EIA.

1.2.2 Offshore infrastructure for the project will include:

- *Wind turbines and foundations (options for foundation include jacket, gravity base, suction caisson, monopile and floating foundations);*
- *Array cables linking the turbines;*
- *Substation platforms;*
- *Export cables connecting the substations to the landfall;*
- *Interconnector cables;*
- *Accommodation platform(s); and*
- *Up to two meteorological masts (met masts).*

1.3 Scope of Document

1.3.1 The purpose of this assessment is to determine, as far as is possible from existing information and bespoke survey data, the nature, extent and significance of the known and potential marine archaeological resource within the boundary of the proposed project.

1.4 Aims

1.4.1 The specific aim of this marine archaeological Technical Report is to summarise the known and potential archaeological baseline within the project area to subsequently inform the EIA and production of the PEIR/ES.

1.4.2 The objectives of the assessment are as follows:

- *To provide details of relevant legislation, national and local planning policy, and best practice guidance;*
- *To assess the 2016 geophysical survey datasets provided by VWPL in order to identify any material of possible archaeological and cultural heritage significance present within the project area;*
- *To compare the results of the geophysical interpretation with the results of previous archaeological assessments of geophysical data and historic records within the project area;*
- *To update the interpretation of the results of the previous studies where necessary based on their appearance in the 2016 data. This will include updating the*



archaeological discrimination and hence removing from the final gazetteer of anomalies in the project area those that are now interpreted as non-anthropogenic in origin;

- *To review geotechnical logs to identify sediments of potential archaeological interest and assess alongside the sub-bottom profiler (SBP) data;*
- *To compare the geophysical and geotechnical interpretation with desk-based assessments, historical data, known archaeological sites and previous investigations in the vicinity of the project area to outline the known and potential marine archaeological resource;*
- *To assess the setting of marine heritage assets from offshore activities;*
- *To summarise the Historic Seascape Character for the area that the project truncates;*
- *To assess the significance of the known and potential marine archaeological resource through weighted consideration of their valued components; and*
- *To recommend mitigation measures for any potential archaeological or cultural heritage assets newly identified within the project area, including the addition of new Archaeological Exclusion Zones where necessary within the project area.*

1.5 Copyright

- 1.5.1 This report may contain material that is non-Wessex Archaeology copyright (e.g. Ordnance Survey, British Geological Survey (BGS), Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the Copyright, Designs and Patents Act 1988 with regard to multiple copying and electronic dissemination of the report.

2 LEGISLATION, GUIDANCE AND POLICY

2.1 Introduction

- 2.1.1 The provisional OCC extends through English Territorial Waters, up to 12 nautical miles (nm) from the coast, whilst NV East and NV West are located within the UK Exclusive Economic Zone (EEZ). The archaeological curator responsible for the offshore archaeological resource, from Mean High Water Springs (MHWS) to the 12nm limit are the Historic England Marine Planning Unit, with specialist advice provided by the Historic England East of England Science Advisor with regard to activities undertaken as part of the project. Historic England also act as specialist advisors to the Marine Management Organisation (MMO), who is responsible for licencing, regulating and planning marine activities around England to ensure they are carried out in a sustainable way.
- 2.1.2 The following section provides a summary of the national, regional and local planning and legislative framework that governs the treatment of the marine historic environment in the planning process. More comprehensive details are provided in **Appendix I**.
- 2.1.3 Details regarding terrestrial legislation, in particular, the Planning Act 2008, and other relevant onshore guidance and policy are presented in the onshore archaeological desk-based assessment for the project (Royal HaskoningDHV, forthcoming).



2.2 Marine Legislation

2.2.1 NV East and NV West are located within the UK EEZ, and the provisional OCC extends through the English Territorial Sea (up to 12nm) from the coast into the UK EEZ. The following legislation applies to marine heritage within both the UK EEZ and English Territorial Sea:

- *Protection of Wrecks Act 1973: Section One and Two;*
- *Ancient Monuments and Archaeological Areas Act 1979 (as amended);*
- *Protection of Military Remains Act 1986; and*
- *Merchant Shipping Act 1995.*

2.2.2 The above legislation provides protection for wrecks of high historical, archaeological or artistic value, as well as allowing military wrecks and aircraft remains to be protected. Ownership of any wreck remains is determined in accordance with the Merchant Shipping Act 1995.

2.2.3 More information regarding the details of each piece of legislation is presented in **Appendix I**.

2.3 International Conventions

2.3.1 The UNESCO Convention on the Protection of Underwater Cultural Heritage was concluded in 2001, and is a comprehensive attempt to codify the law internationally, with regards to underwater cultural heritage. The UK abstained in the vote on the final draft of the Convention, however it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 2nd January 2009, having been signed or ratified by 20 member states.

2.4 National Planning Policy Framework (NPPF)

2.4.1 The National Planning Policy Framework (NPPF) was published by the Department for Communities and Local Government (DCLG) in March 2012, replacing Planning Policy Statement 5.

2.4.2 Section 12 of the NPPF entitled 'Conserving and enhancing the historic environment' sets out the principal national guidance on the importance, management and safeguarding of heritage assets within the planning process. The aim of NPPF Section 12 is to ensure that Regional Planning Bodies and Local Planning Authorities, developers, and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect them. The government guidance provides a framework that:

- *Recognises that heritage assets are an irreplaceable resource;*
- *Requires applicants to provide proportionate information on the significance of heritage assets affected by the proposals and an impact appraisal of the proposed development on that significance;*
- *Takes into account the desirability of sustaining and enhancing the significance of heritage assets and their setting;*
- *Places weight on the conservation of designated heritage assets;*



- *Requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible; and*
- *Promotes the conservation of heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life for this and future generations.*

2.5 Marine Policy

- 2.5.1 The Marine and Coastal Access Act 2009 (MCAA) is the primary legislation relevant to marine development plans. Under this legislation, marine plans must be consistent with the Marine Policy Statement (MPS; Department for Environment, Food and Rural Affairs, 2011) and fully reflect the requirements of the MPS at a local level. Marine plans must also be in accordance with other UK national policy, including the National Planning Policy Framework (NPPF; Department for Communities and Local Government, 2012). The MCAA will be incorporated within the requirements of the project's Development Consent Order, necessary under the provisions of the Planning Act 2008.
- 2.5.2 Under the MCAA, the UK was divided into marine planning regions, with an associated authority responsible for preparing a Marine Plan for that area. The MPS sets out the framework for preparing Marine Plans and making decisions affecting the marine environment. The MPS also states that Marine Plans must ensure a sustainable marine environment that will protect heritage assets.
- 2.5.3 In England, the MMO have divided the inshore and offshore waters into 11 plan areas for which marine plans are to be produced. The Norfolk Vanguard project is within the East Inshore and East Offshore plan areas. The East Inshore and East Offshore Marine Plans were released in April 2014 (East Marine Plans page on the gov.uk website, accessed 27/04/2017).

2.6 Marine Guidance

- 2.6.1 This assessment was carried out in a manner consistent with available guidance as described below in chronological order of issue:
- *Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers (English Heritage (now Historic England), 1998);*
 - *Managing Lithic Scatters: Archaeological Guidance for planning authorities and developers (English Heritage (now Historic England), 2000);*
 - *Military Aircraft Crash Sites: Guidance on their significance and future management (English Heritage (now Historic England), 2002);*
 - *The Code of Practice for Seabed Developers (Joint Nautical Archaeology Policy Committee and The Crown Estate, 2006);*
 - *Historic Environment Guidance for the Offshore Renewable Energy Sector (COWRIE, 2007);*
 - *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008);*
 - *Our Seas – A shared resource: High level marine objectives (DEFRA, 2009);*



- *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition) (English Heritage (now Historic England), 2011);*
- *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (COWRIE, 2011);*
- *Ships and Boats: Prehistory to Present: Designation Selection Guide (English Heritage (now Historic England), 2012);*
- *Standard and Guidance for Historic Environment Desk-based Assessment (Chartered Institute for Archaeologists, 2014).*
- *The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning: 3 (Historic England, 2015);*
- *Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (Bates, R. Dix, J. K., Plets, R., 2013); and*
- *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (English Heritage (now Historic England), 2015).*

3 METHODOLOGY

3.1 Study Area

- 3.1.1 The area assessed in this report is defined by the development extents of NV East, NV West and the provisional OCC, hereafter referred to as the ‘study area’ (**Figure 1**). The provisional OCC is delimited by the MHWS at its landward extent.

Search Area

- 3.1.2 A search area, encompassing all of the project elements, was used for obtaining records from relevant archive databases. The wider search area allows for a greater understanding of the wider archaeological baseline environment, with the dual purpose of enabling any archaeological trends within the region to be recognised and to allow any heritage assets identified to be represented in a broader archaeological context.
- 3.1.3 All data for heritage assets located within this search area are stored on the Wessex Archaeology archive network and can be made available on request.

3.2 Archaeological Desk-Based Assessment

- 3.2.1 . The methodology follows the best practice professional guidance outlined by the Chartered Institute for Archaeologists’ (CIfA) *Standard and Guidance for Historic Environment Desk-Based Assessment* (2014).
- 3.2.2 The marine themes relevant to marine archaeological baseline as assessed in this report are:
- *Seabed prehistory (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes);*
 - *Seabed features, including maritime sites (such as shipwrecks and associated material including cargo, obstructions and fishermen’s fasteners) and aviation sites (aircraft crash sites and associated debris);*
 - *Intertidal heritage assets;*
 - *Setting of marine heritage assets from offshore activities; and*



- *Historic seascape character.*

Data Sources

- 3.2.3 A number of sources of information were consulted in order to compile this Technical Report. Data generated from marine geophysical and geotechnical surveys were also a main component of the data and are discussed further in section 3.3.
- 3.2.4 The following data sources were consulted in order to compile the desk-based element of the assessment:
- *The United Kingdom Hydrographic Office (UKHO) data for charted wrecks and obstructions;*
 - *The National Record of the Historic Environment (NRHE) maintained by Historic England, comprising data for terrestrial and marine archaeological sites, find spots and archaeological events;*
 - *The National Heritage List for England maintained by Historic England, comprising data of designated heritage assets including sites protected under the Protection of Military Remains Act 1986 and the Protection of Wrecks Act 1973;*
 - *The Norfolk Historic Environment Record (NHER), comprising a database of all recorded terrestrial and marine archaeological sites, find spots and archaeological events within the county and offshore;*
 - *The Historic Seascape Characterisation (HSC) report for East Yorkshire to Norfolk (Newcastle University, 2014);*
 - *Relevant mapping including Admiralty Charts, historic maps and Ordnance Survey; and*
 - *Relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeological Data Service and other websites (presented in the 'References'; section 11 of this document).*

Data Handling

- 3.2.5 This report is supported by a Geographic Information System (GIS) using ArcGIS 10.2, incorporating the positional information of the various data sources listed above, allowing the data to be spatially analysed. The data were subsequently compiled into gazetteers of the prehistoric, maritime and aviation, and intertidal resources within the study area; these were used to inform the assessment of geophysical data.
- 3.2.6 Within this assessment, the gazetteers for the marine and intertidal datasets are compiled and presented in Universal Transverse Mercator (UTM) Zone 31 North projected from a European Terrestrial Reference System (ETRS) 1989 datum.
- 3.2.7 Information relating to the marine heritage that did not include location or positional information were also used to inform the marine archaeological baseline assessment where relevant.

Chronology

- 3.2.8 Archaeological material is generally studied within a framework of 'periods' or 'ages' that reflect the activities and cultural changes taking place over time. All dates are referred to as BC (before Christ), BP (before present) or AD (anno domini) within the text. By convention, BC refers to calibrated radiocarbon chronology that can be considered



equivalent to calendar years. BP dates are used for periods of time older than c.10,000 years ago.

- 3.2.9 A list of the main archaeological periods in Britain referred to in the text, along with their broadly defined dates, are presented in **Appendix II**.

Seabed Prehistory

- 3.2.10 The baseline summary for Seabed Prehistory was based on a review of geological mapping of seabed sediments, solid geology and bathymetry from published BGS sources. This has been enhanced by the geoarchaeological review of geotechnical and geophysical datasets gathered for the project to produce a stratigraphic framework for understanding the archaeological potential of the Quaternary geology within the area investigated. This assessment was further supported by the examination of models of past sea level, palaeoshorelines and submerged prehistoric landscapes. This palaeogeographic review, alongside the known archaeological record, formed the basis upon which the potential for submerged prehistory could be developed and discussed in support of the subsequent PEIR and ES Chapters.

- 3.2.11 The data obtained were compiled to form a gazetteer as part of the seabed prehistory baseline. These records were each given a unique identifier beginning with **75000** and continuing sequentially (**Appendix III, IV and V**), and were added to the project GIS.

Maritime and Aviation Archaeology

- 3.2.12 The sources of data for maritime and aviation history and archaeology listed in section 3.2.4 above have been collated and summarised in order to develop a baseline of marine cultural heritage for the study area, and the potential for encountering unknown shipwreck and aircraft crash sites (section 5). Sources of data relevant to maritime and aviation archaeology are the UKHO, NRHE and NHER.

- 3.2.13 The data obtained were reviewed and those located within the study area were extracted and compiled to form a gazetteer as part of the known maritime and aviation baseline. These records were each given a unique identifier beginning with **70000** and continuing sequentially (**Appendix VI, VII and VIII**), and were added to the project GIS.

- 3.2.14 For the purposes of this assessment, records with duplicate positions between datasets were amalgamated and their co-ordinates are taken from the UKHO dataset as the raw data therein is based on hydrographic survey data presented in the WGS84 datum. These co-ordinates were converted from WGS84 into UTM31N eastings and northings based on the ETRS89 datum (as described in section 3.2.6) using the Quest Geodetic Calculator version. Furthermore, the NRHE and NHER datasets are primary terrestrial datasets expressed in British National Grid, and are considered to be less accurate offshore.

- 3.2.15 The research for maritime and aviation history was then combined with the archaeological assessment of geophysical survey data.

- 3.2.16 Data relating to Recorded Losses were also extracted from the NRHE, NHER and UKHO data sources. Recorded Losses are records for ships or aircraft that are known to have wrecked or crashed offshore, but for which the exact locations are not known. Recorded Losses are often grouped by area into Maritime Named Locations by the NRHE. For example, a Recorded Loss within this dataset may be based on the loss of a vessel 'off the coast at Happisburgh' or associated with a known navigational hazard such as a sand bank or rocks (which may give rise to a falsely precise geographic coordinate for the record). The positional data of these records is unreliable and serves only to provide an

indication of the types of vessels that passed through the area and the wrecking incidents that are known to have occurred in the general region. Whilst the remains of these vessels and aircraft are expected to exist somewhere on the seafloor, their location is unknown. As such, they signify the potential maritime and aviation resource.

- 3.2.17 Details regarding Recorded Losses, whose Named Location happens to be located within the study area, are presented in a gazetteer format (**Appendix X** and **XII**). These records have retained their original identification assigned by the UKHO, NRHE or NHER for ease of cross-referencing. Where records are duplicated between datasets all corresponding identification numbers have been included, but are referred to in the text by the NRHE Monument ID if one exists. The gazetteer does not include positional data due to the inaccuracies therein.
- 3.2.18 The baseline assessment of maritime and aviation archaeology was further supplemented by a review of relevant primary and secondary source material in order to provide an indication on the nature of maritime and aviation activity across the region. As well as summarising the known archaeological resource, the baseline assessment underlines the potential for encountering unknown shipwreck and aircraft crash sites within the study area (English Heritage (now Historic England), 2002; Wessex Archaeology, 2008).

Intertidal Archaeology

- 3.2.19 Since the assessment of the onshore element of the project will extend to the MHWS, there is no overlap with the intertidal and offshore study area discussed in this assessment. Data from the NRHE and NHER is provided in two spatial formats, points and polygons. All points and polygons that intersect the study area have been included within the assessment; however it should be noted that co-ordinates given for the polygon records is the centre-point generated using ArcGIS 10.2, which may lie outside the study area.

3.3 Geophysical and Geotechnical Methodology

- 3.3.1 Geophysical survey and geotechnical data were collected between September and November 2016 over NV West and the provisional OCC survey areas. In addition, assessments were undertaken by Wessex Archaeology in 2014 over the former East Anglia Zone that fall within the current study areas.
- 3.3.2 The review for this assessment includes an assessment of geophysical datasets. The 2016 NV West and provisional OCC geophysical survey was undertaken by Fugro Survey B. V. (Fugro) (Fugro, 2016; Fugro, 2017a; 2017b). The NV East (formerly East Anglia Four) geophysical datasets were acquired by EMU Limited (EMU) and were obtained in 2012 (EMU Ltd, 2013). The 2012 former East Anglia Zone Offshore Transmission Owner (OFTO) survey data were acquired by Coastline Surveys Ltd.. The northern end of the OFTO area overlaps with the eastern end of the provisional OCC, as illustrated in **Figure 1**.
- 3.3.3 Wessex Archaeology has previously carried out a Zonal Environmental Assessment (ZEA) commissioned by Environmental Resources Management (ERM) on behalf of East Anglia Offshore Wind Limited (EAOW). The survey data was acquired by Gardline Geosurvey between April and August 2010 (Wessex Archaeology, 2012). The results from this assessment have not been incorporated into the current assessment as the data were collected over widely spaced corridors 6km apart and only 4% of the NV West area was covered. The 2016 data cover the whole of NV West and the provisional OCC and are also of better quality.



Data Sources

- 3.3.4 Wreck and obstruction data within the development area were obtained from the UKHO. Records located within the survey areas were integrated with the geophysical results as outlined above.
- 3.3.5 Any sites found to be outside the survey areas are deemed beyond the scope of the current assessment and are subsequently not included in this report.
- 3.3.6 The 2016 NV West and provisional OCC geophysical survey data comprised sidescan sonar, magnetometer, multibeam bathymetry and sub-bottom profiler datasets acquired by Fugro Survey B. V. between 1 September and 15 November 2016 on-board three survey vessels, the *Fugro Pioneer*, *RV Discovery* and *Valkyrie*. The NV East geophysical datasets were acquired by EMU and were obtained between 19 June and 4 September 2012 on-board the survey vessel *MV Aurelia* (EMU Ltd, 2013). The 2012 former East Anglia Zone OFTO survey data were acquired by Coastline Surveys Ltd. and were obtained between 19 June and 8 October 2012 on-board the survey vessel *MV Flatholm*.

Geophysical Data – Technical Specifications

- 3.3.7 The *Fugro Pioneer* survey over NV West and the offshore section of the provisional OCC was undertaken between 7 September and 14 November 2016. The *RV Discovery* undertook its survey across the middle section of the provisional OCC between 1 September and 15 November 2016 and *Valkyrie* undertook its survey across the inshore end of the provisional OCC between 23 September and 18 October 2016 (Fugro, 2016; Fugro, 2017a; 2017b).
- 3.3.8 Vessel *Fugro Pioneer* deployed an EdgeTech 4200-FS digital sidescan sonar towfish operated at frequencies of 100kHz and 600kHz and 125m range. Sidescan sonar data were acquired with a range of 125m across NV West, line spacings used across the site were 100m with cross lines run at approximately 1,000m. Sidescan sonar data were provided to Wessex Archaeology as .xtf files. A G-882 marine magnetometer was used to acquire magnetometer data, the files were provided to Wessex Archaeology in .csv format. Multibeam bathymetry data were acquired using a Kongsberg EM2040 multibeam echosounder operating at 400kHz. These data were provided to Wessex Archaeology as an .xyz file. The sub-bottom profiler (SBP) data were acquired using 16 element Massa TR-1075 hull mounted pinger. The data were digitally recorded and provided to Wessex Archaeology as .sgy files.
- 3.3.9 Vessel *RV Discovery* deployed an EdgeTech 4200-FS sidescan sonar towfish operated at 300kHz and 600kHz, the range varied between 50m, 75m and 100m. A Kongsberg EM2040 dual-head dual-swath system used to acquire multibeam bathymetry data was operated at 200 – 400kHz. A Geometrics G-882 magnetometer was used to acquire magnetometer data, these were provided to Wessex Archaeology in the same format as those from the *Pioneer*. Line spacing was approximately 50m. SBP data for all three vessels were acquired using hull-mounted pinger systems. The data were digitally recorded and provided to Wessex Archaeology as .sgy files.
- 3.3.10 The *Valkyrie* acquired sidescan sonar data using an EdgeTech 4125 towfish operated at 400kHz and 900kHz and a range of 25m. A Teledyne RESON 7125 dual-head dual-swath system was used to acquire multibeam bathymetry data at 400kHz. A Geometrics G-882 magnetometer towfish was used to acquire magnetometer data. The data were acquired at a 15m line spacing as a minimum. This had a 150m overlap with data collected by *RV Discovery*. The data files were provided to Wessex Archaeology in the same formats as the *Fugro Pioneer* data.



- 3.3.11 The 2012 geophysical survey data over NV East were acquired by EMU between 19 June and 4 September 2012 on-board the survey vessel MV *Aurelia*. The datasets consisted of sidescan sonar, magnetometer, multibeam echosounder and pinger and sparker sub-bottom profiler (EMU Ltd, 2013).
- 3.3.12 The sidescan sonar equipment used was an EdgeTech 4200-FS (600/300kHz) with a range of 75m. The sidescan sonar data were digitally recorded and provided to Wessex Archaeology as .*xtf* files. The magnetometer equipment used was a Geometrics G-882 magnetometer initially, which was then later replaced by a Marine Magnetics SeaSPY magnetometer. On the 29 August, the Geometrics G-882 magnetometer was found to be defective and was deemed unusable for further survey operations. This was then replaced with the on-board reserve Marine Magnetics SeaSPY magnetometer. The magnetometer data were digitally recorded and provided to Wessex Archaeology as .*txt* files.
- 3.3.13 The multibeam echosounder system deployed was a moon pool-mounted R2Sonic 2024 (300kHz head). The multibeam bathymetry data were digitally recorded and provided to Wessex Archaeology as ungridded .*xyz* files and gridded SD files. The NV East data were acquired using a Geo-Spark 200 sparker with a 24 element single channel trailing hydrophone receiver. The SBP data were digitally recorded and provided to Wessex Archaeology as .*sgy* files.
- 3.3.14 The main lines were spaced at 100m intervals and cross lines spaced at 2km intervals. Both the primary and secondary positioning used for the survey was a Fugro StarPack GNSS receiver with Starfix G2 differential corrections.
- 3.3.15 The 2012 former East Anglia Zone OFTO geophysical datasets were acquired by Coastline Surveys Ltd. and were obtained between 19 June and 8 October 2012 on-board the survey vessel MV *Flatholm*. The datasets consisted of sidescan sonar, magnetometer, single-beam and multibeam echosounder and pinger and boomer sub-bottom profilers.
- 3.3.16 The total survey area for the former East Anglia Zone OFTO totalled approximately 6700 line km. Coastline Surveys used an EdgeTech 4200-FS sidescan sonar system operated at 100kHz and 400kHz with a range of 75m. The sidescan sonar data were digitally recorded and provided to Wessex Archaeology as .*xtf* files.
- 3.3.17 Equipment specifications were not provided with the magnetometer data. The data were digitally recorded and supplied to Wessex Archaeology as cleaned and despiked .*csv* files
- 3.3.18 The multibeam echosounder system deployed was a hull-mounted Reson Seabat 7125 SV2 system. The multibeam bathymetry data were digitally recorded and provided to Wessex Archaeology as ungridded .*txt* files and processed gridded .*asc* files.
- 3.3.19 Equipment specifications were not provided with the sub-bottom profiler data, though the data were collected using a boomer probably coupled with a trailing hydrophone receiver. The data were digitally recorded and provided to Wessex Archaeology as navigation corrected .*SGY* files.

Data Quality – Geophysical Data

- 3.3.20 Each geophysical dataset was assessed for quality and rated using the criteria listed in **Table 1** below.

Table 1: Criteria for assigning geophysical data quality rating

| Data Quality | Description |
|--------------|-------------|
|--------------|-------------|



| Data Quality | Description |
|--------------|--|
| Good | Data which are clear and unaffected by weather conditions or sea state. The dataset is suitable for the interpretation of standing and partially buried metal wrecks and their character and associated debris field. These data also provide the highest chance of identifying wooden wrecks and debris. |
| Average | Data which are affected by weather conditions and sea state to a slight or moderate degree. The dataset is suitable for the identification and partial interpretation of standing and partially buried metal wrecks, and the larger elements of their debris fields. Wooden wrecks may be visible in the data, but their identification as such is likely to be difficult. |
| Variable | This category contains datasets with the quality of individual lines ranging from good to average to below average. The dataset is suitable for the identification of standing and some partially buried metal wrecks. Detailed interpretation of the wrecks and debris field is likely to be problematic. Wooden wrecks are unlikely to be identified. |

- 3.3.21 The 2016 sidescan sonar data have been rated as 'Variable' using the above criteria table, with some lines exhibiting good quality data and others displaying below average quality with evidence of poor weather conditions or sea state. The horizontal range of the data varied between 25m in the inshore areas to typically 75m and 125m in the offshore areas. Overall, even with this variability the data were generally of suitable quality to support a robust archeological assessment.
- 3.3.22 The magnetometer data have been rated as 'Average' using the criteria table. A number of the data files have been affected by noise and some background variation is visible throughout the dataset. In a number of files frequent spiking is visible and some lines display noise created by alterations in tow cable length.
- 3.3.23 The multibeam bathymetry data have been rated as 'Good' using the above criteria table. The data quality and resolution of 1m were found to be of a good standard for archaeological assessment.
- 3.3.24 The quality of the SBP data acquired by Fugro on-board the *Fugro Pioneer* has been rated as 'Good' using the above criteria. Good penetration was achieved, with reflectors and structures clearly visible and little background noise identified.
- 3.3.25 The quality of the SBP data acquired by Fugro on-board the *Discovery* and *Valkyrie* have been rated as 'Variable' using the above criteria. A number of lines were affected by environmental conditions (presumably weather noise and shallow water depths) to a significant degree, and the record length of some lines was relatively short, meaning the bases of features were not imaged. Data on the *Valkyrie* was acquired with only two transducers, rather than the four transducer pinger system on the RV *Discovery*. The lower power combined with a hard and / or sandy seabed resulted in relatively poor penetration in some areas. As such, it cannot be guaranteed all palaeogeographic features of archaeological potential have been identified within the areas covered by these data sets.
- 3.3.26 The 2012 NV East geophysical data comprised sidescan sonar, magnetometer, multibeam echosounder and sub-bottom profiler data acquired by EMU between 19 June and 4 September 2012 on-board the survey vessel MV *Aurelia*. The sidescan sonar data have been rated as 'Good' using the above criteria. The data quality and positioning was found to be of a generally high standard with some lines showing signs of weather noise but on the whole suitable for archaeological assessment.



- 3.3.27 The magnetometer data were rated as 'Variable' from an archaeological perspective using the above criteria. The magnetometer data appeared to be highly affected by the geological composition of the site. There are abundant sandwaves, sand megaripples and sand banks that have affected the magnetometer data as background noise which has the potential to hide and mask smaller potential archaeological anomalies and thus made identification more difficult.
- 3.3.28 The multibeam bathymetry data have been rated as 'Good', the data quality and resolution of 1m were found to be of a good standard for archaeological assessment.
- 3.3.29 The quality of the SBP data acquired by EMU in 2012 has been rated as 'Average' using the above criteria. Good penetration was achieved with reflectors generally clearly visible, although a high degree of swell was identified on a number of lines which could not be completely removed during processing. However, this did not detrimentally affect the data to a significant degree and it is still deemed suitable for archaeological interpretation.
- 3.3.30 Wessex Archaeology processed and assessed all of the sidescan sonar and magnetometer data for the NV East area. The multibeam bathymetry data were processed and assessed over all wreck locations and seabed features of potential archaeological interest identified in the sidescan sonar and magnetometer data. The sub-bottom profiler data were assessed on every 5th main line of data, giving 20% coverage of the study area. To aid in the interpretation of features and ensure consistency of interpretation between the main lines, cross lines were also interpreted over any identified palaeolandscapes features of possible archaeological potential.
- 3.3.31 The 2012 former East Anglia Zone OFTO survey data were acquired by Coastline Surveys Ltd. and were obtained between 19 June and 8 October 2012 on-board the survey vessel MV *Flatholm*. This comprised sidescan sonar, magnetometer, single-beam and multibeam echosounder and sub-bottom profiler data.
- 3.3.32 The sidescan sonar data have been rated as generally 'Good' using the above criteria with a small number of lines that were 'Variable'. The data quality and positioning was found to be of a generally high standard with some lines showing signs of weather noise but on the whole suitable for archaeological assessment.
- 3.3.33 The magnetometer data were rated as 'Variable' from an archaeological perspective. A number of the data files have been affected by background variation in the form of geology, sandwaves and megaripples, these have the potential to hide and mask smaller possible archaeological anomalies.
- 3.3.34 The multibeam bathymetry data have been rated as 'Good' using the above criteria, with features clearly visible within the 1m resolution data.
- 3.3.35 Problems with the sub-bottom profiler data experienced before the data was handed to Wessex Archaeology resulted in a trackplot being provided with an 'interpretability index' rating, ranging from 'Good' to 'Very Poor', assigned to each survey line. According to this information, the sub-bottom profiler (sparker) data have been rated as generally 'Poor' or 'Very Poor', with very few lines rated as 'Average' or 'Good'. A number of lines were not available to be used for interpretation, mainly along the eastern edge of the former East Anglia Zone OFTO area. The data is often affected by high degrees of swell and penetration and resolution of features is generally very low.
- 3.3.36 Wessex Archaeology processed and assessed all of the sidescan sonar and magnetometer data. The multibeam bathymetry data were processed and assessed over



all wreck locations and seabed features of potential archaeological interest identified in the sidescan sonar and magnetometer data. The sub-bottom profiler data were assessed on every 5th main line of data, giving 20% coverage of the study area in the main line direction, and every available cross line. To aid in the interpretation of features, additional infill lines were also interpreted where specific features of potential archaeological interest were identified.

Processing – Geophysical Data

- 3.3.37 High frequency .xtf sidescan sonar files were processed by Wessex Archaeology using Coda Geosurvey software. This allowed the data to be replayed with various gain settings in order to optimise the quality of the images. The data were initially scanned to give an understanding of the geological nature of the site and were then interpreted for any objects of possible anthropogenic origin. This involves creating a database of anomalies within Coda by tagging individual features of possible archaeological potential, recording their positions and dimensions and acquiring an image of each anomaly for future reference.
- 3.3.38 A mosaic of the sidescan sonar data is produced during this process to assess the quality of the sonar towfish positioning. The survey lines are smoothed and the navigation corrected. This process allows the positioning of anomalies to be checked between different survey lines and for the layback values to be further refined if necessary.
- 3.3.39 The form, size and / or extent of an anomaly is a guide to its potential to be an anthropogenic feature and therefore of archaeological interest. A single small but prominent anomaly may be part of a much more extensive feature that is largely buried. Similarly, a scatter of minor anomalies may define the edge of a buried but intact feature, or it may be all that remains as a result of past impacts from, for example, dredging or fishing.
- 3.3.40 The magnetometer data files were processed in Geometrics MagPick software. The software enables both the visualisation of individual lines of data and the gridding of data to produce a magnetic anomaly map. The data were smoothed to try to eliminate any observed noise, a trend was then fitted to the resulting data and the trend values subtracted from the smoothed values. This was carried out in an attempt to remove natural variations in the data (such as diurnal variations in magnetic field strength and changes in geology). The processed data were then gridded to produce a map of magnetic anomalies. Individual anomalies were tagged and images taken in a similar process to that undertaken for the sidescan sonar data.
- 3.3.41 The multibeam bathymetry data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The data were gridded processed at the appropriate resolution and analysed using Fledermaus software, which enables a 3-D visualisation of the acquired data and geo-picking of seabed anomalies.
- 3.3.42 The SBP data were studied in order to detect and in-filled palaeochannels, ravinement surfaces, peat/fine-grained sediment horizons, or other deposits that may have archaeological potential. The data were processed by Wessex Archaeology using Coda Seismic+ software. This software allows the data to be visualised with user selected filters and gain settings in order to optimise the appearance of the data for interpretation. The software then allows an interpretation to be applied to the data by identifying and selecting sedimentary boundaries and shallow geological features that might be of archaeological interest.



- 3.3.43 The SBP data were interpreted with a two-way travel time (TWTT) along the z-axis. In order to convert from TWTT to depth, the velocity of the seismic waves was estimated to be 1,600ms⁻¹. This is a standard estimate for shallow, unconsolidated sediments.
- 3.3.44 Any small reflectors which appear to be buried material such as a wreck site covered by sediment were also recorded, the position and dimensions of any such objects noted in a gazetteer, and an image of each anomaly acquired. It should be noted that anomalies of this type are rare, as the sensors must pass directly over such an object in order to produce an anomaly.

Anomaly Grouping and Discrimination – Geophysical Data

- 3.3.45 The previous section describes the initial interpretation of all available geophysical datasets which were conducted independently of one another. This inevitably leads to the possibility of any one object being the cause of numerous anomalies in different datasets and apparently overstating the number of archaeological features in the survey areas.
- 3.3.46 To address this fact, the anomalies were grouped together along with any previously identified features from past investigations and UKHO records of wrecks and obstructions that fall within the survey areas. This allows one ID number to be assigned to a single object for which there may be, for example, a UKHO record, a magnetic anomaly and multiple sidescan sonar anomalies.
- 3.3.47 Once all geophysical anomalies and desk-based information have been grouped, a discrimination flag is added to the record in order to discriminate against those which are not thought to be of archaeological concern. For anomalies located on the seabed, these flags are as follows:

Table 2: Criteria discriminating relevance of seabed feature to proposed scheme

| | | |
|---------------------------|----|--|
| Non-Archaeological | U1 | Not of anthropogenic origin |
| | U2 | Known non-archaeological feature |
| | U3 | Position of a recorded loss at which no physical wreck remains have ever been identified |
| Archaeological | A1 | Anthropogenic origin of archaeological interest |
| | A2 | Uncertain origin of possible archaeological interest |
| | A3 | Historic record of possible archaeological interest (A3) – UKHO reference to feature that shows no trace on seabed |

- 3.3.48 Similarly, the discrimination flags applied to shallow geological features of possible archaeological potential are ascribed as follows (**Table 3**):

Table 3: Criteria discriminating relevance of palaeogeographic feature to proposed scheme

| | | |
|---------------------------|----|---|
| Non-Archaeological | U2 | Feature of non-archaeological interest |
| Archaeological | P1 | Feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material |
| | P2 | Feature of possible archaeological potential |

- 3.3.49 The grouping and discrimination of information at this stage is based on all available information and is not definitive. It allows for all features of potential archaeological interest to be highlighted, while retaining all the information produced during the course of



the geophysical interpretation and desk-based assessment for further evaluation should more information become available.

Co-ordinate System

- 3.3.50 All 2016 geophysical data were acquired in ETRS89 UTM31N projected coordinates. The 2012 geophysical survey data were acquired in WGS84 UTM Zone 31N. All results are given in ETRS89 UTM31N.

Geoarchaeological Framework

- 3.3.51 Alongside the archaeological assessment of the SBP data, a geoarchaeological assessment of provided geotechnical logs was also undertaken within NV East, NV West and the provisional OCC. Wessex Archaeology has developed a five-stage approach to geoarchaeological investigations, encompassing different levels of investigation appropriate to the results obtained, accompanied by formal reporting of the results at the level achieved. The stages are summarised in **Table 4**.

Table 4: Stages of geoarchaeological assessment

| | |
|--|--|
| Stage 1: Geoarchaeological review | A review of samples and logs generated by geotechnical contractors. This assessment will establish the presence and location of sediment units with likely archaeological, palaeo-environmental and / or dating potential, as a basis for deciding what Stage 2 archaeological recording is required. The Stage 1 report will state the scale of Stage 2 work proposed. Should no further works be required a brief Stage 1 report outlining the results of the assessment will be prepared. |
| Stage 2: Geoarchaeological description & interpretation | Each sample containing sediment units identified as having archaeological, palaeo-environmental or dating potential will be cleaned, recorded, and the sediments described geoarchaeologically following Hodgson (1997). Preliminary interpretations will be made, those units of particular archaeological/palaeo-environmental interest will be highlighted, and an outline deposit model will be constructed/ added to if appropriate. The Stage 2 report will set out the nature and scope of any Stage 3 work which may be required to further characterise and interpret the sediment units in order to identify areas of potential archaeological or palaeoenvironmental significance. If during Stage 2 the potential is shown to be limited to well-defined areas which could be addressed by specific targeted sampling, a programme of investigation combining limited Stage 3/4 works may be proposed. This work would output to a final client report or straight to publication, depending on the requirements of the client and curator. |



| | |
|---|---|
| <p>Stage 3: Sub-sampling and palaeoenvironmental assessment</p> | <p>Sub-sampling and assessment of any units of archaeological and / or palaeo-environmental interest. Sub-samples for the assessment of microfossil environmental indicators (including pollen, diatoms, plant macrofossils, molluscs, ostracods and / or foraminifera) will be taken. As far as possible the subsamples will be taken in such a manner that the remaining core is retained intact should further sub-sampling be required.</p> <p>The subsamples will be assessed, with the relevant ecofacts being identified to at least main Taxon, with quality of preservation and approximate quantification). This enables the value of the palaeo-environmental material surviving within the samples to be identified.</p> <p>Should radiocarbon dating have been specified at this stage by the Stage 2 report, then suitable material will be extracted from appropriate subsamples and submitted. If not, then sub-samples will also be taken and retained at this stage in case radiocarbon dating is required during Stage 4. The Stage 3 report will set out the results of each laboratory assessment, and summarise the archaeological implications of the combined results. The potential of the material will be summarised, and recommendations will be made as to whether any Stage 4 work is warranted. If Stage 4 work is recommended, then the specifics will be laid out.</p> |
| <p>Stage 4: Analysis and Dating</p> | <p>Full analysis of environmental indicators (including pollen, diatoms, plant macrofossils, molluscs, ostracods and / or foraminifera) from subsamples specified in the Stage 3 report.</p> <p>Typically, Stage 4 will be supported by radiocarbon dating of suitable sub-samples. Should Stage 3 assessment indicate that there is no further analytical work required on the microfossil assemblages, consideration will still be given for a programme of radiocarbon analyses to provide a chronological framework for the deposits encountered unless no suitable samples could be procured. The Stage 4 report will provide an account of the palaeo-environment(s) at each relevant sample location within a chronological framework (absolute or relative) and an outline of the archaeological implications of the analysis.</p> |
| <p>Stage 5: Final Reporting</p> | <p>If the archaeological results are sufficiently significant, a final report will be compiled for submission to a suitable journal, to be agreed with the client and curator. This publication report will cover all aspects of the palaeo-topography and prehistory of the area affected by the development, incorporating the results of each stage.</p> <p>If the archaeological results are not significant then the relevant Stage Report(s) will constitute the final documents for the investigation.</p> |

3.3.52 The geoarchaeological assessment within this report comprises Stage 1 of the framework described in **Table 4**, and serves to support the archaeological assessment of the SBP data.

Stage 1 Assessment Methodology

3.3.53 Across the Norfolk Vanguard offshore project area, a total of 65 geotechnical sampling locations were investigated. Vibrocores were acquired at the locations by Fugro Geoconsulting during September 2016. The resulting geotechnical report, including detailed geotechnical logs, was provided to Wessex Archaeology and used as a basis for the Stage 1 assessment (Fugro, 2016). The geoarchaeological assessment was undertaken in September 2016 by geoarchaeologists at Wessex Archaeology (Wessex Archaeology, 2017).

- 3.3.54 This initial review identified sequences of bedded, laminated, fine-grained and organic sediments of probably Pleistocene and Holocene origin and of potential archaeological and palaeoenvironmental interest. As a result, the vibrocores were assigned low, medium, high and very high priority status. Those of high priority were put aside for further Stage 2 geoarchaeological work. Those identified as low priority were geotechnically logged and sampled with archaeological advice given to the geotechnical engineers on recognising and putting aside sediments of geoarchaeological significance. The geotechnical logging and sampling of the medium priority locations were monitored at Fugro House, Wallingford by a geoarchaeologist during October 2016.
- 3.3.55 The geotechnical logs were subject to a desk-based assessment by Wessex Archaeology in order to identify any samples that may contain deposits of archaeological and palaeoenvironmental potential. Of greatest interest are sediments from former terrestrial depositional environments, as well as certain features or inclusions of possible archaeological and palaeoenvironmental interest, specifically:
- *Peat layers;*
 - *Deposits containing other organic material such as wood fragments, roots, dark organic staining etc.;*
 - *Clay or silt deposits, especially those containing laminated features such as lacustrine varves or tidal rhythmites;*
 - *Inorganic fossils (such as molluscs);*
 - *Concentrations of charcoal; and*
 - *Individual artefacts such as pieces of flint or pottery (although finding these within core samples is unusual); and any other feature thought to indicate a terrestrial depositional environment.*
- 3.3.56 In addition to this individual assessment, the geotechnical logs were also assessed alongside the SBP data to aid in determining the shallow geological sequence along the marine cable corridor and identify any palaeolandscape features of archaeological potential.

3.4 Assumptions and Limitations

- 3.4.1 Data used to compile this report consists of primary geophysical and geotechnical survey data and secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this assessment. The assumption is made that the secondary data, as well as that derived from other secondary sources, is reasonably accurate.
- 3.4.2 The records held by the UKHO, NRHE, NHER and the other sources used in this assessment are not a record of all surviving cultural heritage assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. The information held within these datasets is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.

3.5 Assessment of Setting

- 3.5.1 According to the NPPF (Department for Communities and Local Government, 2012), setting is defined as 'the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a

setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.’

- 3.5.2 Furthermore, the significance of an asset can be harmed or lost through development occurring within its setting. As marine heritage assets are irreplaceable, any harm or loss to the setting of an asset needs to be justified (*ibid.*).
- 3.5.3 Specific guidance regarding assessing the setting of marine heritage assets with regards to offshore development does not currently exist. However, within Historic England’s *The Setting of Heritage Assets - Historic Environment Good Practice Advice in Planning: 3* (2015) reference is made to buried heritage assets and their setting that may not be readily appreciated by a casual observer, but retain a presence in the landscape such as (in some rare cases to protected wreck sites) that are periodically, partly or wholly submerged. Furthermore, the location and setting of historic battles, otherwise with no visible traces, may include important strategic views, routes by which opposing forces approached each other and a topography that played a part in the outcome (*ibid.*: 4-5).
- 3.5.4 Following discussion between Royal HaskoningDHV and Historic England (per. comm. V. Cooper, 26/04/2017), ‘the setting assessment for offshore assets should focus more on the physical setting, historic associations and character (i.e. rather than visual, noise, dust etc), measured by reference to the capacity of that setting/character to accommodate change. The extent of change will be described within the assessment although this will not be assessed as an impact.’
- 3.5.5 The assessment of setting in this document will consider the value of the known marine heritage assets located within the study area, through intentional events (e.g. during either an isolated military event (hitting a mine within a known minefield) or battle), with regards to their collective setting in the marine landscape, association with historic events and the way they are experienced in their positions. The assessment will also indicate whether their setting (i.e. any relationships between deposits/material with their wider environment) could be altered, which could lead to an overall diminished value.
- 3.5.6 At this stage of the assessment, it is not possible to ascertain the setting of currently unidentified or derived marine heritage assets, or seabed prehistoric sediments. Subsequently, these features/anomalies have not been included in the assessment. For instance, wrecks lost other than by design (e.g. during a storm or through foundering) are not regarded as having setting as their siting is based on chance alone. If further relevant information becomes available in the future, then an assessment of the setting of these assets could be included.

3.6 Assessment of Historic Seascape Character

- 3.6.1 In accordance with the European Landscape Convention, ‘landscape’ can be defined as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors’ (Council of Europe, 2000: Article 1). The term ‘seascape’ can be defined as a subset of ‘landscape’, and has ‘an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and / or human factors’ (*ibid.*).
- 3.6.2 Seascape assessment reflects the holistic approach to landscape of the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments and cover the offshore environment to the territorial limit (12nm). HSC assessment is the identification and interpretation of the

historic dimension of the present day coastal and marine environment (Natural England, 2012: 33).

3.7 Determining Sensitivity and Value

3.7.1 This Technical Report will ultimately inform an EIA for the project that will be presented within the ES. In order to assess the potential impacts of a development upon the marine environment, EIAs typically adopt the conceptual approach known as the 'source-pathway-receptor' model. This approach is based on the identification of the source (i.e. the origin of a potential impact), the pathway (i.e. the means by which the effect of the activity could impact a receptor) and the receptor that may be impacted (e.g. known/potential heritage assets). For the significance of any given impact to be fully understood, the sensitivity of any receptors that may be impacted need to be considered. This section outlines how the sensitivity of marine heritage assets is ascertained.

3.7.2 The capability of a receptor to accommodate change and its ability to recover if affected is a function of its sensitivity. Receptor sensitivity is typically assessed via the following factors:

- *Adaptability – the degree to which a receptor can avoid or adapt to an effect;*
- *Tolerance – the ability of a receptor to accommodate temporary or permanent change without significant adverse impact;*
- *Recoverability – the temporal scale over and extent to which a receptor will recover following an effect; and*
- *Value – a measure of the receptor's importance, rarity and worth.*

3.7.3 Archaeological and cultural heritage receptors cannot typically adapt, tolerate or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each asset is predominantly quantified only by its value.

Assessment Criteria – Value of an Asset

3.7.4 Based on Historic England's *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (English Heritage, 2008: 21), the significance of a historic asset 'embraces all the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it'.

3.7.5 Within this document, significance is weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- *Evidential value – deriving from the potential of a place to yield evidence about past human activity;*
- *Historical value – deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative;*
- *Aesthetic value – deriving from the ways in which people draw sensory and intellectual stimulation from a place; and*
- *Communal value – deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values, but tend to have additional and specific aspects.*



3.7.6 With regards to assessing the value of shipwrecks, the following criteria listed in English Heritage's *Ships and Boats: Prehistory to Present – Designation Selection Guide* (English Heritage (now Historic England), 2012) can be used to assess an asset in terms of its value:

- *Period;*
- *Rarity;*
- *Documentation;*
- *Group value;*
- *Survival/condition; and*
- *Potential.*

3.7.7 These aspects help to characterise each asset whilst also comparing them to other similar assets. The criteria also enable the potential to contribute to knowledge, understanding and outreach to be assessed.

3.7.8 The value of known archaeological and cultural heritage assets were assessed on a five-point scale using professional judgement informed by criteria provided in **Table 5** below.

Table 5: Criteria to assess the archaeological value of marine assets

| Value | Definition |
|------------------|---|
| Very High | <ul style="list-style-type: none">• Best known or only example and / or significant potential to contribute to knowledge and understanding and / or outreach. Receptors with a demonstrable international dimension to their importance are likely to fall within this category.• Wrecked ships and aircraft that are protected under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986 with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value.• Known submerged prehistoric sites and landscapes with the confirmed presence of largely <i>in situ</i> artefactual material. |
| High | <ul style="list-style-type: none">• Above average example and / or high potential to contribute to knowledge and understanding and / or outreach. Receptors with a demonstrable national dimension to their importance are likely to fall within this category.• All other wrecked ships and aircraft with statutory protection under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value.• Palaeogeographic features with demonstrable potential to include artefactual and / or palaeoenvironmental material, possibly as part of a prehistoric site or landscape. |
| Medium | <ul style="list-style-type: none">• Average example and / or moderate potential to contribute to knowledge and understanding and / or outreach.• Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation.• Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment. |
| Low | <ul style="list-style-type: none">• Below average example and / or low potential to contribute to knowledge and understanding and / or outreach.• Includes wrecks of ships and aircraft that do not have statutory protection or |



| Value | Definition |
|-------------------|--|
| | equivalent significance, but have low potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. <ul style="list-style-type: none">• Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment. |
| Negligible | <ul style="list-style-type: none">• Poor example and / or little or no potential to contribute to knowledge and understanding and / or outreach. Assets with little or no surviving archaeological interest. |

3.7.9 Furthermore, *On the Importance of Shipwrecks* (Wessex Archaeology, 2006) suggests importance can be assessed through the following criteria: build, use, loss, survival and investigation.

3.7.10 To further supplement this approach, the ALSF-funded *Marine Class Description and principles of selection for aggregate producing areas* project (ALSF 5383), undertaken by Wessex Archaeology (2008a), proposed a composite timeline that considers wrecks in five distinct date ranges. The timeline takes into account the broad chronology of shipbuilding, thus drawing out generalisations regarding the age and special value of sites. The timeline is summarised as follows:

- *Pre- 1508 AD: this covers the period from the earliest Prehistoric evidence for human maritime activity to the end of the medieval period, c. 1508. Little is known of watercraft or vessels from this period and archaeological evidence of them is so rare that all examples of craft are likely to be of special value;*
- *1509 to 1815: this encompasses the Tudor and Stuart periods, the English Civil War, the Anglo-Dutch Wars and later the American Independence and French Revolutionary Wars. Wrecks and vessel remains from this date are also quite rare, and can be expected to be of special value;*
- *1816 to 1913: this period witnessed great changes in the way in which vessels were built and used, corresponding with the introduction of metal to shipbuilding, and steam to propulsion technology. Examples of watercraft from this period are more numerous and as such, it is those that specifically contribute to an understanding of these changes that should be regarded as having special value;*
- *1914 to 1945: this period encompasses the World War I (WWI), the Interwar years and the World War II (WWII). This date range contains Britain's highest volume of recorded boat and ships losses. Those which might be regarded as having special interest are likely to relate to technological changes and to local and global activities during this period; and*
- *Post 1945: the final period extends from 1946 through the post-war years to the present day. Vessels from this date range would have to present a strong case if they are to be considered of special interest.*

3.7.11 The perceived value of each marine archaeological asset is generally assessed and assigned on a site-by-site basis, depending on the criteria listed in **Table 5**. The UK Marine Policy Statement (Department for Environment, Food and Rural Affairs, 2011: 90) describes a heritage asset as holding a degree of significance. Significance relates to the heritage interest of an asset that may be archaeological, architectural, artistic or historic.



4 ARCHAEOLOGICAL ASSESSMENT OF SEABED PREHISTORY

4.1 Geological Baseline

- 4.1.1 The NV West and NV East areas are situated approximately 47km and 89km east of the nearest location on the coast in north Norfolk, respectively. The associated provisional OCC extends 95km east from the landfall search area between Bacton Green and Happisburgh South (**Figure 1**).
- 4.1.2 This places the study area within the southern North Sea Basin. This shallow marine basin has existed in the approximate location of the North Sea since the Early Tertiary (although the exact location and extent has altered over time), which is reflected in the geology of the region (Cameron *et al.*, 1992).
- 4.1.3 The background geology of the study area is dominated by a series of Pleistocene deposits, ranging in age from the Lower Pleistocene (Westkapelle Ground Formation) to the Upper Devensian (Twente Formation).
- 4.1.4 The Pleistocene history of the southern North Sea is dominated by repeated glacial / interglacial cycles and the effects of the associated rises and falls in relative sea level, which has resulted in large areas of the southern North Sea being periodically exposed as a terrestrial environment. This is represented in the geological record, with distinct terrestrial landscape features being present, interspersed with deposits of marine and glacially derived sediments. This series of terrestrial and shallow marine deposits represents the Pleistocene geological record of the area.
- 4.1.5 The southern North Sea off the coast of East Anglia, is thought to have directly experienced only one episode of glaciation, during the Anglian Period (c. 480,000 to 423,000 BP), although the area will still have been affected by the changes in sea level resulting from subsequent glacial / interglacial cycles (**Figure 2**). The exact southern extent of the Anglian glaciation is currently debated, although a series of enclosed deeps previously identified within multibeam bathymetry data, most notably two large features located between the Shipwash and Inner Gabbard sand banks, have been interpreted as being glacial in origin (Emu, 2009). This suggests that at least a lobe of the Anglian ice sheet extended as far south as offshore Felixstowe (**Figure 3**).
- 4.1.6 As the area off East Anglia has only experienced at the most one glacial advance, palaeolandscapes features from periods of low relative sea level are more likely to be preserved here rather than further north (approximately north of the north Norfolk coast), where they have been removed during the subsequent Saalian and Devensian glacial advances.
- 4.1.7 The terrestrial Pleistocene sediments in this area generally comprise fluvial and associated deposits (e.g. palaeochannels, gravel terraces, floodplain deposits), and deposits associated with lagoon and lacustrine environments.
- 4.1.8 Overlying the Pleistocene sediments is a sequence of Holocene deposits. Surveys and coring in this area have identified deposits of terrestrial sediments, including peat, which are thought to have been deposited prior to and during the early to mid-Holocene marine transgression. Some of these cores appear to show a gradual upwards transition through saltmarsh peat to intertidal mud, and as such give evidence of the flooding of a terrestrial landscape by the rapidly advancing sea (Cooper *et al.*, 2008).



- 4.1.9 These terrestrial sediments are overlain by a deposit of sands, gravels and muds, which represent modern marine sediment deposited since the Holocene marine transgression. Based on regional sea-level curves this occurred c. 8,900 to 5,000 BP.
- 4.1.10 Holocene seabed features of note within the area are the sand banks known as the Great Yarmouth Banks, located off the Norfolk coast. In particular, Smiths Knoll, Hearty Knoll and Winterton Ridge, which lie just north of the provisional OCC (Cooper *et al.*, 2008). These are a system of ridges of reworked outwash sediments from the last glaciation, formed and maintained by tidal meander channels. These mostly overlie the pre-glacial Pleistocene sediments.

4.2 Geophysical and Geotechnical Palaeogeographic Assessment

- 4.2.1 The following section details the results of the palaeogeographic assessment of the geophysical data. To aid in the archaeological assessment of the sub-bottom profiler data, a basic stratigraphy of the whole study area was devised from both the assessed data and the geotechnical logs. This broad stratigraphy is summarised below, with detailed descriptions of individual palaeogeographic features presented after by study area. A full table detailing the individual palaeogeographic features is also provided in **Appendix III, IV and V**. There are no designated prehistoric archaeological sites located in the study area.
- 4.2.2 A total of eight broad geological units were identified (**Table 6**):

Table 6: Shallow geological units identified within the study areas

| Unit | Unit Name | Geophysical Characteristics ⁽¹⁾ | Sediment Type ⁽²⁾ | Archaeological Potential |
|------|--|--|---|---|
| 8 | Holocene Seabed Sediments (post-transgression) (Marine Isotope Stage (MIS) 1) | Generally observed as a veneer or thickening into large sand wave and bank features up to 10m thick. Boundary between surficial sediments and underlying units not always discernible. | Gravelly sand with shell fragments, sand waves and ripples indicate sediment is mobile. | Considered of low potential in itself, but possibly contains re-worked artefacts and can cover wreck sites and other cultural heritage. |
| 7 | Holocene Sediments (Pre-transgression) (MIS 2 to 1) | Small shallow infilled channels with either seismically transparent fill, or fill characterised by sub-parallel internal reflectors. Also comprises a basal high amplitude reflector peat layer. | Fluvial, estuarine and terrestrial (including peat) deposits. | Potential to contain <i>in situ</i> and derived archaeological material, and palaeoenvironmental material. |
| 6 | Twente Formation (Upper Devensian) (MIS 3 to 2) | Not definitively identified within the geophysical data. | Thin layer of aeolian periglacial sand. | Potential to contain <i>in situ</i> and derived archaeological and palaeoenvironmental material, and to protect underlying surfaces. |



| Unit | Unit Name | Geophysical Characteristics ⁽¹⁾ | Sediment Type ⁽²⁾ | Archaeological Potential |
|------|--|--|---|---|
| 5 | Brown Bank Formation (Late Ipswichian to Lower Devensian) (MIS 5d to 3) | Observed as a blanket deposit across much of the area, either acoustically transparent or characterised by sub-horizontal layered reflectors. | Clayey silty sand infilling channels or hollows and deposited in an intertidal / lagoon environment. | <i>In situ</i> Lower Palaeolithic artefacts may be protected. Middle Palaeolithic <i>in situ</i> and derived artefacts may be associated particularly with channel edges dependent on the age of the fill. Palaeoenvironmental information. Basal contact may cover old land surfaces. |
| 4 | Lower Brown Bank / Eem Formation (Ipswichian or Lower Devensian) (MIS 5e to 5d) | Observed within large topographically controlled depressions. Characterised by low relief basal and either an acoustically transparent or well-layered fill. | Silty sand and sandy silt, possible intertidal or shallow marine deposits. | <i>In situ</i> Lower Palaeolithic artefacts may be protected. Middle Palaeolithic <i>in situ</i> and derived artefacts may be associated particularly with channel edges dependent on the age of the fill. Palaeoenvironmental information. Basal contact may cover old land surfaces. |
| 3 | Swarte Bank Formation (Anglian) (MIS 12) | Not definitively identified within the geophysical data | Sub-glacial channel fill, comprising a basal reworked till with upper glaciolacustrine / glaciomarine sediment. | Unlikely to contain archaeological material. |
| 2 | Yarmouth Roads Formation (Lower to Middle Pleistocene) (MIS 62 to 13) | Thick unit either seismically chaotic or containing numerous areas of well-defined cross cutting channel complexes characterised by layered sub-parallel internal reflectors. Top of unit generally a well-defined regional erosion surface. | Silty sand with occasional shell fragments with occasional layers of clay. Generally becoming silty with depth. Sediments deposited as part of delta complex. | Possibility of <i>in situ</i> finds in later part of formation if not eroded. Contemporaneous with terrestrial Cromer Forest Bed Formation (Pakefield and Happisburgh). Has been found to contain plant debris, wood and peat in some areas of possible palaeoenvironmental importance. Potential greatest where associated with river valleys. |



| Unit | Unit Name | Geophysical Characteristics ⁽¹⁾ | Sediment Type ⁽²⁾ | Archaeological Potential |
|--|---|---|--------------------------------|-----------------------------------|
| 1 | Westkapelle Ground Formation (Lower Pleistocene) (MIS 103 to 63) | Acoustically unstructured unit with a generally well-defined basal reflector. | Deltaic silty clays and sands. | Pre-Earliest occupation of the UK |
| ⁽¹⁾ Based on geophysical data | | | | |
| ⁽²⁾ Based on borehole data and Cameron <i>et al.</i> , (1992) | | | | |

4.2.3 The above stratigraphy is a combination of the identified shallow geological units from across the three study areas. The entire stratigraphy was not identified in any one single place, and the exact number of units present will differ depending on location.

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4.2.4 Of the stratigraphy outlined in **Table 6**, only Unit 2, Unit 4, Unit 5 and Unit 8 were identified within NV East. This area is characterised by broad, elongate, generally NNW to SSE trending features, the locations of which are illustrated in **Figure 4**. Individual features or archaeological potential are described in **Appendix III**.

4.2.5 The basal shallow geological unit within NV East is Unit 2, the Yarmouth Roads Formation and is observed across the entirety of this area. Generally, Unit 2 is a relatively acoustically unstructured unit, with very few internal reflectors. However, in some areas, large, complex cross cutting channels are observed, characterised by well-defined sub-parallel internal reflectors. In NV East, these channel features are most obvious towards the west of the area.

4.2.6 Unit 2 is identified in the vibrocores as predominantly sand with occasional laminae of clay and thick clay beds. It is interpreted as an extensive delta top deposit covering a large section of the southern North Sea, deposited during the Cromerian prior to the Anglian Glaciation (Cameron *et al.*, 1992).

4.2.7 The upper layers of the Yarmouth Roads Formation are interpreted as being contemporaneous with the Cromer Forest Bed Formation of East Anglia, within which the Lower Palaeolithic sites at Happisburgh and Pakefield have been discovered (Parfitt *et al.*, 2010; Parfitt *et al.*, 2005). As such, there is the potential for both *in situ* and reworked archaeological and palaeoenvironmental material to be present within Unit 2. The potential for archaeological material of this age within the offshore region is considered greatest in the upper layers of Unit 2 and in areas of internal channelling. Due to the extensiveness and complexity of the upper Unit 2 channels, features have not been mapped individually. Due to this complexity, the channels within this unit are interpreted as a complex delta-top deposit rather than a single river channel.

4.2.8 One feature, anomaly number **75014**, was interpreted as being a small area of intermittent high amplitude reflectors, possibly within Unit 2. This may be indicative of preserved organic material which may suggest a buried terrestrial environment, and such material (e.g. peat and wood) has been retrieved by sampling from within the Yarmouth Roads formation in the past (Cameron *et al.*, 1992). Any well-preserved organic matter



discovered within Unit 2 may be of palaeoenvironmental importance, as preserved material from within these sediments can be used to aid in the reconstruction and dating of buried landscapes.

- 4.2.9 Directly above Unit 2 in the NV East area are a number of infilled topographically-controlled depressions (**75000**, **75003**, **75009**, **75011**, **75015**, **75016** and **75017**; **Figure 4**). These are elongate (trending approximately NNW to SSE), relatively broad and shallow features, and in NV East are characterised by either a single or two phases of acoustically unstructured fill (**Figure 5**). Borehole information from the 2010 phase of the study, (EA10-G-006, which samples feature **75015**), indicates the lower fill comprises sandy silt, and the upper fill silty fine sand, whilst CPT data from along the provisional OCC (VC116) suggests a single fill of dense sand.
- 4.2.10 These features have been classified as Unit 4, but their age is uncertain. They could belong to one of two BGS formations; either the Eem Formation, or a lower unit of the Brown Bank Formation. The Eem Formation is Ipswichian in age, and is described as a shallow marine / intertidal deposit of shelly and muddy sands, whilst the Brown Bank Formation is a lagoon deposit of Lower Devensian Age (Cameron *et al.*, 1992). The features identified here could represent a gradual transition between the Eem and Brown Bank formations, and be either Upper Ipswichian or Lower Devensian in age (MIS 5e to 5d).
- 4.2.11 The archaeological potential of these features depends on their age. As a marine deposit, the archaeological potential of the Eem Formation is considered relatively low, although the unit may cover and protect earlier land surfaces. The potential of the Brown Bank Formation is interpreted to be higher, with the possibility of derived artefacts and intact organic material of palaeoenvironmental interest. However, human absence in the area during the development of the Lower Brown Bank indicates the unit is unlikely to contain *in situ* artefacts. Further work would need to be undertaken to determine the precise age of these Lower Brown Bank Formation / Eem Formation infilled depressions.
- 4.2.12 Situated above Unit 4 is a blanket deposit of Brown Bank Formation (Unit 5), present across the whole of NV East. This unit is characterised by poorly defined sub-horizontal internal reflectors, and has been found by vibrocoring undertaken as part of the Norfolk Vanguard study to comprise silty clay and clayey silt, with an occasional upper layer of cleaner loose silt. As previously mentioned, this is interpreted as being a Lower Devensian lagoon deposit. Dating of similar upper Brown Bank Formation sediments to the east indicate that that the infill continued into the late Devensian during the period of human re-occupation (Limpenny *et al.* 2011).
- 4.2.13 The archaeological potential of the Brown Bank Formation is variable, with *in situ* and derived artefacts possible where the unit forms channel features. Complex internal features (described in both the NV West and provisional OCC sections below) have been identified within Unit 5 in other areas (mostly NV West), although no such features have been identified within NV East. This may be due to an absence of these features in this area, or due to differences in data resolution between different data sets. Due to this lack of internal features, the archaeological potential for this blanket deposit within NV East is thought to be lower than that in other areas of the site.
- 4.2.14 However, large areas of seismic blanking, interpreted as representing accumulations of shallow gas, have been identified within Unit 5. These have been included within the list of palaeolandscapes features (**Figure 4**), as they suggest the presence of preserved organic material within the sediment. The source of the gas may be uncertain, however. The largest accumulations of gas (**75002** and **75004**) appears to be generally associated with

the largest of the Lower Brown Bank Formation / Eem Formation features (**75000**, **75003**, and **75009**), and are orientated along the same general NNW to SSE alignment. This possibly suggests the actual source of the gas may be within these earlier (Unit 4) features, not in the Unit 5 blanket deposit itself. However, the correlation is not entirely consistent and this interpretation remains uncertain.

- 4.2.15 Samples from within Unit 5, acquired as part of the geotechnical survey, have been recommended for further geoarchaeological work in order to refine the interpretation and archaeological potential of the Brown Bank Formation (Wessex Archaeology, 2017).
- 4.2.16 Overlying Unit 5 across the site is a deposit of post-transgression Holocene marine sediment (Unit 8), found by boreholing to comprise fine to coarse sand, which is silty and contains organic matter in some areas (probably reworked). This sediment varies in thickness from a thin veneer to sand banks up to 15m thick, and the boundary between it and the underlying Unit 5 is often unclear. These sediments are not considered to be of archaeological potential in themselves, although they could periodically bury and expose sites such as shipwrecks in areas of mobile sediment, and thicker sand deposits could protect earlier land surfaces.

Norfolk Vanguard West

- 4.2.17 The shallow geological sequence within NV West is very similar to NV East. In this area, all of units outlined in **Table 6** have been identified, with the exception of Unit 1. The locations of palaeolandscapes features of archaeological potential is illustrated in **Figure 6**, and individual features described in **Appendix IV**.
- 4.2.18 The oldest unit identified within NV West is Unit 2 (Yarmouth Roads Formation) and is observed throughout the area. The unit is generally acoustically unstructured, with some areas containing distinct, complex, cross-cutting channels. As previously described, there is the potential for both *in situ* and reworked archaeological and palaeoenvironmental material to be present within the upper layers of Unit 2, especially in the vicinity of channels features.
- 4.2.19 Unit 3 was not definitively identified by Wessex Archaeology during the geophysical assessment of the SBP data, but interpretation of deeper stratigraphy undertaken by Fugro using ultra high resolution (UHR), multi-channel data (Fugro, 2017a), has indicated it is present within NV West. Unit 3 is characterised by a number of deep, generally north – south trending palaeovalleys infilled with an acoustically unstructured fill. These are interpreted as Swarte Bank Formation channels – subglacial valleys created during the Anglian glaciation, filled with redeposited till and possible glaciolacustrine / glaciomarine sediment (Cameron *et al.*, 1992).
- 4.2.20 Due to the nature of this unit and the subglacial environment in which it was deposited, Unit 3 is not considered of archaeological interest. As such, these features are not described further.
- 4.2.21 In contrast with the relatively large, distinct features visible within NV East, Unit 4 has only been tentatively, sporadically identified within NV West. Here, the features are relatively thinner, and correlation between individual survey lines proved difficult. As such, no individual features from Unit 4 have been mapped within NV West, but it should be highlighted that scattered remnants of this unit are likely to remain at the base of the Brown Bank Formation (Unit 5).
- 4.2.22 As described previously, the archaeological potential of Unit 4 depends on its age. As a marine deposit, the archaeological potential of the Eem Formation is considered relatively

low, although the unit may cover and protect earlier land surfaces. The potential of the Brown Bank Formation is interpreted to be higher, with the possibility of derived artefacts and intact organic material of palaeoenvironmental interest.

- 4.2.23 As with NV East, Unit 5 is present as a blanket deposit across the whole of NV West, and in this area is a well-defined deposit characterised by numerous sub-parallel internal reflectors, suggesting well-layered sediments, with a distinct basal reflector (**Figure 7**). Within NV West, Unit 5 appears to be a complex unit with several different types of internal features, some of which may be of palaeogeographic interest.
- 4.2.24 Within the southern section of the NV West area, a small area of coarse sediment deposit of Ipswichian or Devensian age is identified at the base of the Brown Bank Formation (**75127**). The feature is identified as a small mound above the Unit 5 basal reflector on the SBP data and is interpreted as being a possible bank deposit or transgression feature, which could represent the remnant of a past coastline or coastal bank. As such, there is the potential for it to contain both *in situ*, depending on the time of deposition relative to periods of hominin occupation, and derived archaeological material. It could also cover and protect a section of intact land surface, and be of potential importance to palaeoenvironmental studies. However, further work, such as analysis of core samples, would be required to confirm this interpretation of this feature. This is the only such feature of this type to be identified within NV West.
- 4.2.25 A number of V-shaped features have been identified within Unit 5. These are characterised by a poorly defined to absent basal reflector and an acoustic transparent or chaotic fill, in contrast with the surrounding layered fill characteristic of most of the unit. These features often have their origin just below the base of Unit 5 in the upper layers of Unit 2, and have been interpreted as fluid escape features. As natural features created by diagenetic processes, these fluid escape structures are not considered to be of archaeological potential.
- 4.2.26 A number of internal surfaces have been identified, which range from relatively strong undulating reflectors to surfaces providing a boundary between two different sets of internal reflectors with slightly different angles of dip. These have been interpreted as possible internal erosion surfaces.
- 4.2.27 As the Brown Bank Formation is interpreted as a shallow lagoon deposit, it is possible that the lagoons dried up periodically, exposing the previously submerged sediment surface as dry land. These drying episodes could then have created the identified internal erosion surfaces. If this is the case, these surfaces could be of high archaeological potential as they would represent buried land surfaces. However, their exact potential would depend upon their age.
- 4.2.28 The identified erosion surfaces are difficult to trace between survey lines and, as such, could not be mapped with a high degree of confidence. They are therefore not included in the gazetteer of palaeogeographic features.
- 4.2.29 Of particular interest within Unit 5 are four areas of anomalous internal features – **75055**, **75081**, **75099** and **75115**. These are mostly clustered along the west of NV West, loosely aligned in a belt running NNW to SSE along the western edge of the area, although one small group (**75081**) is located towards the east (**Figure 6**).
- 4.2.30 These features are situated on top of erosion surfaces as described previously, and are characterised by a series of acoustically unstructured sediment domes with the more typical Unit 5 fill draped over the top (**Figure 8**). These have been interpreted as possible



relict dune features, developed on an erosion surface during a period of drying of the Brown Bank Formation lagoon.

- 4.2.31 Some of these features can be fairly large, up to 2 to 3m in height, suggesting the exposure of the erosion surface as a terrestrial landscape for a significant period of time. This long time period increases the archaeological potential of the erosion surfaces identified within Unit 5, especially those in the vicinity of the dune features. These could not only have provided a surface upon which human communities lived, but the mobile dunes could also preserve and protect any underlying land surface.
- 4.2.32 The elongate nature of some of the areas of dunes, combined with their alignment, suggest they may represent a buried coastline. However, more work would need to be carried out in order to test this interpretation.
- 4.2.33 Small areas of acoustic blanking, interpreted as shallow gas, have also been identified within Unit 5. These are present at two levels within the stratigraphy. A small area of acoustic blanking, **75056**, has been identified relatively deep within Unit 5. This has the 'classic' appearance of shallow gas, with a high amplitude reflector and associated blanking, and potentially indicates the presence of preserved organic material within the sediment.
- 4.2.34 The remaining areas of acoustic blanking are much shallower, and located towards the top of Unit 5. These are much less distinct, have a poorly defined reflector and the associated blanking is less pronounced. These could either be areas of shallow gas created by organic material within the sediment, or they could represent localised gravel deposits. Feature **75100** is an elongate area of blanking apparently directly associated with shallow, pre-transgression Holocene channelling.
- 4.2.35 Areas of blanking are not considered of high archaeological potential in themselves, but they could represent areas of preserved organic material of interest to palaeoenvironmental studies.
- 4.2.36 The presence of internal features such as erosion surfaces and dunes within Unit 5 suggest that the Brown Bank Formation is a more complex unit than previously thought. The SBP data suggest a multi-period, multi-phase unit rather than a single continuous deposition of lagoon clay, which may have implications for the archaeological potential of the unit as a whole.
- 4.2.37 Vibrocore samples from within Unit 5 have been recommended for further geoarchaeological work to refine the interpretation and archaeological potential (Wessex Archaeology, 2017).
- 4.2.38 Overlying the Brown Bank Formation within some areas of NV West is the Twente Formation (Unit 6). This was not definitively identified within the SBP data, but sediments tentatively associated with the Twente Formation have been identified within a number of vibrocores (VC075, VC076, and VC088). The approximate extents of Unit 6 have been taken from the BGS data (BGS 1984) and displayed in **Figure 6**.
- 4.2.39 The vibrocore data indicate the Twente Formation is a thin deposit of sand, approximately 1m thick, and is interpreted as a periglacial aeolian sand deposit of Upper Devensian age. Following the Last Glacial maximum (LGM), the northward retreat of the Devensian ice sheet would have exposed fresh land surfaces. Without extensive vegetation to hold sediment in place, winds would have carried loose sediments southwards to be deposited as aeolian sand.



- 4.2.40 Such wind-blown covers and deposits are also found in East Anglia and on continental Europe, where they have relatively high archaeological potential. In such low-lying, predominantly wetland, areas, even relatively small sand ridges such as these can produce an area of high, potentially dry ground which would be favourable for habitation. Sites such as Peacock's Farm in Cambridgeshire and the Great Coversand Ridge in northern Belgium show that Prehistoric communities were using such features (Crombé *et al.*, 2012). The surrounding (and underlying) Brown Bank Formation suggests a similar low-lying wetland landscape within the area, and as such there is the potential for *in situ* archaeological material to be present within the Twente Formation.
- 4.2.41 Vibrocore samples acquired during the Norfolk Vanguard geotechnical survey from within Unit 6 have been recommended for further geoarchaeological assessment to refine the interpretation and archaeological potential (Wessex Archaeology, 2017).
- 4.2.42 Overlying Unit 6 are a series of Holocene deposits, which have been divided into pre-transgression (Unit 7) and post transgression (Unit 8). The pre-transgression deposits comprise a number of different features. In the northern half of NV West, and very approximately correlated to the extents of Unit 6, is a distinct, intermittent but extensive high amplitude reflector (e.g. **75029**, see **Appendix IV** for full list of features; **Figure 9**). This has been found by vibrocoreing to represent a distinct peat horizon.
- 4.2.43 This peat layer overlays Unit 6 (VC075, VC076 and VC088) and Unit 5 (VC080), but in some places also seems to be within the top metre of Unit 5 itself (VC085). This suggests an extensive terrestrial landscape in this area potentially forming preferentially on top of the aeolian sand deposits. Since the layer extends onto Unit 5, it may indicate periods of drying of the Brown Bank lagoon lasted long enough for such land surfaces to form.
- 4.2.44 The layer has been interpreted as Early Holocene in age, but, due to the possible presence of the same peat layer within the upper Brown Bank Formation, development of the surface may have commenced in the Late Devensian. This layer is likely the 'basal peat' described by BGS as being present at the base of the Elbow Formation (Cameron *et al.*, 1992).
- 4.2.45 This peat layer is considered of high archaeological and palaeoenvironmental potential, as it could contain *in situ* archaeological artefacts and preserved organic material. A number of vibrocore samples from within this layer have been recommended for geoarchaeological assessment (Wessex Archaeology, 2017).
- 4.2.46 A total of 12 shallow channel features have been identified in the NV West area (**75021**, **75025**, **75035**, **75038**, **75045**, **75061**, **75077**, **75092**, **75103**, **75112**, **75122**, and **75125**) (**Figure 6**). These are thought to be pre-transgression fluvial features, and are deemed to be of high archaeological interest as they may provide evidence of a former terrestrial environment and could contain both *in situ* or derived anthropogenic artefacts and preserved palaeoenvironmental material.
- 4.2.47 Some of these Unit 7 channel features appear to correspond with the aforementioned high amplitude peat layer, and are potentially part of the same landscape. Channel feature **75112**, a meandering channel orientated approximately north – south, is followed and overlain by high amplitude feature **75113**. Vibrocore VC074 found a thick bed of clayey peat present within this feature, indicating that this may represent a former terrestrial landscapes and as such, the sediments associated with this feature are deemed to be of high archaeological potential. The feature also appears to be in line with an area of acoustic blanking (feature **75100**) which may indicate diffuse gas in the sediments or a

localised gravel deposit, possibly relating to an older segment of this relict fluvial environment.

- 4.2.48 A further 38 features interpreted to be the same age as the palaeochannels were identified within the NV West area (see **Appendix IV** for full list). These features were only identified along one or two survey lines and could not be traced any distance as coherent palaeochannels. As such, they have been classified as isolated cut and fill features. It is possible that they are the remnants of eroded palaeochannel systems, but as their nature is less certain they are considered of lower archaeological potential.
- 4.2.49 The post-transgression Holocene sediments (Unit 8) are represented by a deposit of marine sediment, found from vibrocore analysis to comprise fine to coarse silty sand, occasionally containing (probably reworked) organic matter in some areas. This sediment varies in thickness from a thin veneer to thick sand dunes, and the boundary between it and the underlying Brown Bank Formation unit is often unclear. These sediments are not considered to be of archaeological potential in themselves, although they could periodically bury and expose sites such as shipwrecks in areas of mobile sediment, and thicker sand deposits could protect earlier land surfaces.

Provisional Offshore Cable Corridor

- 4.2.50 The shallow geological sequence in the offshore part of the provisional OCC is similar to that experienced within NV East and NV West. However, the sequence changes close to shore. The locations of the features are illustrated in **Figure 10a-d**. Individual features or archaeological potential are described in **Appendix V**.
- 4.2.51 The oldest unit in the sequence interpreted along the provisional OCC is the Westkapelle Ground Formation (Unit 1). Vibrocores acquired as part of the Norfolk Vanguard geotechnical survey have shown the unit to comprise silty sand with some clay layers, and deposited in an open-marine shelf environment dating from the Upper Pliocene and the Lower Pleistocene. As such, it is considered too old to be of archaeological interest as it pre-dates the earliest known human occupation of the UK. Unit 1 outcrops at seabed at the landward end of the provisional OCC, and is gradually overlain by younger deposits further offshore.
- 4.2.52 Unit 1 is directly overlain by Unit 2 (Yarmouth Roads Formation) along most of the provisional OCC. As with NV East and NV West, this unit is generally acoustically unstructured, with some areas containing distinct, complex, cross-cutting channels. As previously described, there is the potential for both *in situ* and reworked archaeological and palaeoenvironmental material to be present within the upper layers of Unit 2, especially in the vicinity of channel features.
- 4.2.53 Unit 3 (Swarte Bank Formation) was not definitively identified by Wessex Archaeology during the geophysical assessment (or by Fugro during their deeper investigations (Fugro, 2017b)), but BGS data (BGS, 1991) indicates a relatively restricted deposit potentially exists at the landfall location. Due to the nature of this deposit and the subglacial environment it was deposited in, Unit 3 is not considered of archaeological interest.
- 4.2.54 Unit 4 has been tentatively identified in some areas of the provisional OCC. As with NV West, this unit proved difficult to trace with confidence between survey lines, and, as such, few definitive features attributed to this unit have been mapped. Of those that have, the majority (**75017**, **75128** and **75129**) are located on the border between the provisional OCC and NV East, whilst one feature (**75152**) is located south of NV West (**Figure 10b**). Features **75128** and **75129** appear to continue into NV East, although no evidence for

them was found during data interpretation of this area. This is attributed to the higher resolution of the more recent data set.

- 4.2.55 As described previously, the archaeological potential of Unit 4 depends on its age. As a marine deposit, the archaeological potential of the Eem Formation is considered relatively low, although the unit may cover and protect earlier land surfaces. The potential of the Brown Bank Formation is interpreted to be higher, with the possibility of derived artefacts and intact organic material of palaeoenvironmental interest. Vibrocore data from within feature **75152** (VC116) suggests Unit 4 along the provisional OCC comprises dense sand. Although some features attributed to Unit 4 have been mapped, it should be noted that other isolated areas of this unit are likely to be present at the base of Unit 5.
- 4.2.56 Offshore, a blanket deposit of Unit 5 (Brown Bank Formation) is present above Unit 2 (and Unit 4, where present). This unit becomes more intermittent closer to shore, where earlier units outcrop at seabed, and is completely absent by approximately 30km from landfall (**Figure 10c**).
- 4.2.57 As within NV West, Unit 5 along the provisional OCC is generally a well-defined deposit characterised by numerous sub-parallel internal reflectors, suggesting well-layered sediments, with a distinct basal reflector. Also as within NV West, Unit 5 along the provisional OCC appears to contain a number of internal features, some of which may be of palaeogeographic interest.
- 4.2.58 Some internal surfaces have been identified, that have been interpreted as possible internal erosion surfaces. As previously described for NV West, these surfaces, potentially created due to periodic drying of the Brown Bank lagoon, could be of high archaeological potential as they would represent buried land surfaces. However, their potential would depend upon their age.
- 4.2.59 The identified erosion surfaces are difficult to trace between survey lines and, as such, have not been mapped or included in the gazetteer of palaeogeographic features.
- 4.2.60 Five areas of dune features (**75156**, **75157**, **75158**, **75161** and **75162**) have also been identified within Unit 5 along the provisional OCC, all situated within the westernmost outcrop of Unit 5 (**Figure 10c**). These are similar to the dune features identified within NV West, but are generally smaller and less well developed. Also as with NV West, they are aligned approximately NNW to SSE, suggesting they may represent a past shoreline. However, more work would need to be carried out in order to test this interpretation. These features are interpreted to be of high archaeological potential, and may contain both *in situ* and derived archaeological material, and may protect the underlying land surface.
- 4.2.61 Small areas of acoustic blanking have also been identified within Unit 5. These are mostly located in the east of the provisional OCC (**75136**, **75137**, **75138** and **75139**), although one area (**75154**) is situated further west. These could either be areas of shallow gas created by organic material within the sediment, or they could represent localised gravel deposits.
- 4.2.62 Areas of acoustic blanking are not considered of high archaeological potential in themselves, but they could represent areas of preserved organic material of interest to palaeoenvironmental studies.
- 4.2.63 Unit 6 (Twente Formation) has not been definitively identified within the OCC. However, two small areas of the deposit are reported by BGS (BGS 1991) as being located within

the provisional OCC, south of NV West. These have been mapped and are illustrated in **Figure 10a**.

- 4.2.64 As described previously, this unit could have provided a land surface upon which human communities could have lived. As such, Unit 6 has a high archaeological potential and could contain *in situ* archaeological artefacts.
- 4.2.65 Overlying Unit 6 are a series of Holocene deposits, which have been divided into pre-transgression (Unit 7) and post transgression (Unit 8). The pre-transgression deposits comprise a number of different features. A few areas (mainly **75140**, **75142** and **75143**) of high amplitude reflectors have been identified overlying Unit 5 and Unit 6 to the south-west of NV West (**Figure 10a**). No vibrocore samples have been obtained from within these features, but correlation with similar high amplitude reflectors in NV West suggest they potentially represent peat deposits.
- 4.2.66 Vibrocore VC111, in the eastern end of the provisional OCC, sampled a thick lamina of black fibrous peat at 5.3m below seabed (BSB), within a unit of slightly sandy clay (interpreted as Unit 5). Although this appears to loosely correspond with a seismic horizon identified on the SBP data, the feature is not as distinct as with the areas of peat within NV West. Also, peat was not identified in any other vibrocores in the vicinity. Therefore, this feature hasn't been mapped as it has been elsewhere, and may be considered as a small, isolated patch of organic material. However, it does indicate that other, similar, isolated deposits may exist within the study areas that are not visible within the SBP data.
- 4.2.67 Peat deposits such as these indicate the presence of buried land surfaces and, as such, are considered of high archaeological and palaeoenvironmental potential.
- 4.2.68 Four channel features have also been identified along the provisional OCC, cutting into the top surface of Unit 5. These features (**75131**, **75144**, **75150** and **75153**; **Figure 10a**) are interpreted as the remnants of fluvial channels, and are considered of high archaeological potential.
- 4.2.69 Two of these channel features, **75131** and **75150**, appear to have associated blanking of lower horizons. Although the basal reflector for both these features is poorly defined, the features are mainly delineated by disruption to the underlying Brown Bank Formation structure. The apparent seismic blanking is possibly an indication of increased gas content caused by the microbial breakdown of organic matter at the base of these channels.
- 4.2.70 Feature **75131** appears to extend eastwards into the NV East. However, the feature was not identified during data interpretation of this area, probably due to differences in data quality.
- 4.2.71 A further 13 features are thought to be of the same age as the channels described above, but are interpreted as cut and fill features (**75135**, **75148** to **75149**, **75151**, **75155**, **75159** and **75163** to **75169**). These features were only identified along one or two survey lines and could not be traced any distance as coherent palaeochannels. As such, they have been classified as isolated cut and fill features. It is possible that they are the remnants of eroded palaeochannel systems, but as their nature is less certain they are considered of lower archaeological potential.
- 4.2.72 Feature **75163** is a simple cut and fill feature identified within the central section of the provisional OCC corridor (**Figure 10c**). The feature has a distinct, high amplitude basal reflector and some possible blanking of lower horizons. This may indicate the presence of

gaseous organic matter, or it may be that it represents coarse, possibly gravelly deposits at the base of the feature.

- 4.2.73 Features **75167** and **75168**, identified in the nearshore section of the provisional OCC (**Figure 10d**), are similar to the aforementioned cut and fills, however they appear to have more than one phase of fill and have therefore have been classified as a complex cut and fill features.
- 4.2.74 The post-transgression Holocene sediments (Unit 8) are represented by a deposit of marine sediment, found by vibrocoreing to comprise fine to coarse silty sand, occasionally containing (probably reworked) organic matter in some areas. This sediment varies in thickness from a thin veneer to thick sand dunes, and the boundary between it and the underlying Brown Bank Formation unit is often unclear. These sediments are not considered to be of archaeological potential in themselves, although they could periodically bury and expose sites such as shipwrecks in areas of mobile sediment, and thicker sand deposits could protect earlier land surfaces.

4.3 Archaeological Potential

- 4.3.1 The archaeological history of the southern North Sea is directly linked to the previously described glacial / interglacial cycles, and the associated changes of the environment across the region. Due to the fluctuations of Quaternary glaciations, the corresponding rises and falls in eustatic sea level, and major reconfigurations of the landscape during the last million years, the archaeological record is phased between periods of occupation and long periods of hiatus when environmental conditions or high sea levels restricted access to Britain (Hijma *et al.*, 2012; Pettitt and White, 2012) (**Figure 2**).
- 4.3.2 The southern North Sea off the east coast of East Anglia is known to contain relatively well preserved palaeolandscape features such as fluvial channels, created during periods of sea level lowstand but while the landscape was still free of ice. The remains of this terrestrial landscape are frequently recovered by dredging and fishing in numerous areas around the southern North Sea, generally in the form of the remains of extinct megafauna (e.g. mammoths, bison, horse etc.).
- 4.3.3 The discovery of actual human artefacts, such as hand axes and worked bone, is a rarer occurrence, but such artefacts have been recovered. Reported finds from offshore activity has, to date, produced a range of early prehistoric lithic artefacts indicating early prehistoric activity in submerged palaeolandscapes from Lower, Middle, and Upper Palaeolithic periods (Tizzard *et al.*, 2014; Tizzard *et al.*, 2015; Wessex Archaeology, 2011e; Wessex Archaeology, 2013a), with notable collections of more recent Mesolithic artefacts from submerged palaeolandscape contexts (Momber *et al.*, 2011; Wessex Archaeology, 2013a).

Lower Palaeolithic (c. 970,000 to 300,000 BP; >MIS 9)

- 4.3.4 The oldest prehistoric (Lower Palaeolithic) evidence north of the Iberian Peninsula in Europe has been found on the East Anglian coast, with key sites at Pakefield (c. 700,000 BP) (Parfitt *et al.*, 2005) and Happisburgh Site 3 (c. 970,000 BP) (Ashton *et al.*, 2014; Parfitt *et al.*, 2010). These sites represent activity near the northern shores of a huge North Sea basin estuarine landscape which drained many major European rivers, including the Bytham / Ingham palaeo-river (Rose, 2009; Westaway, 2009), the palaeo-Thames-Medway system which drained northwards through Essex and East Anglia (Bridgland, 1994), as well as the Rhine (Hijma *et al.*, 2012). The palaeogeography of the Middle Pleistocene enduringly saw Britain as being part of a huge peninsula of north-western Europe; the now-submerged regions were of extensive low-lying estuaries, major

river systems, plains and rolling hills. It was a rich, diverse and productive landscape like any contemporary example, and should not be considered as a temporary land-bridge or intermittent linkage to continental Europe (Coles, 1998).

- 4.3.5 Whilst the archaeology at Pakefield was created during a more Mediterranean climate, around MIS 17, the remains at Happisburgh Site 3 are indicative of colder-than-present conditions at the edge the boreal zone (Candy *et al.*, 2011), indicating that earlier hominins were capable of surviving in conditions previously thought to be too harsh (Parfitt *et al.*, 2010).
- 4.3.6 The importance of these sites is international, as they are currently unique at this latitude for this early date (Wessex Archaeology, 2013). Cohen *et al.* (2012) have highlighted the North Sea basin as a key region for understanding Pleistocene hominins within a northerly, coastal environment. The east of England, particularly East Anglia, but also the south-east of England, are important regions for Lower Palaeolithic archaeology in the last 500,000 years during MIS 13 and 11 (Hoxnian interglacial) (Wymer, 1999; Pettitt and White, 2012).
- 4.3.7 Around 400,000 BP (MIS 11, Hoxnian interglacial), within the palaeo-Thames-Medway system at Clacton, Essex, artefactual evidence suggests two phases of lithic technology; earlier 'Clactonian' pebble tools in the earlier warming phase of MIS 11, and Acheulean-type tools in the later cooling phase of the Hoxnian, suggesting that at the same site two different groups of hominins were producing tools (Pettitt and White, 2012).

Early Middle Palaeolithic (c. 350,000 to 180,000 BP; MIS 9 to 6)

- 4.3.8 During the Saalian glaciation (MIS 10) there was a hiatus in hominin activity in Britain (Pettitt and White, 2012). When hominins returned, *H. neanderthalensis*, they brought a new lithic technology: the Levallois prepared core technique developing from MIS 9, c. 300,000 BP (Scott and Ashton, 2011). They were hunters adapted to a 'mammoth steppe' environment (Ashton and Lewis, 2002).
- 4.3.9 The international importance of Early Middle Palaeolithic archaeology in the southern North Sea is highlighted by the numerous sites preserved within the Thames river terraces (White *et al.* 2006, Scott *et al.* 2011) and, in particular, by the submerged prehistoric Levallois lithic assemblage from marine aggregates licence Area 240 in the palaeo-Yare catchment. Over 120 artefacts have now been recovered from this locale, some of which are identifiable as Levallois, many recovered from *in situ* or near *in situ* contexts (Tizzard *et al.*, 2014, 2015; Wessex Archaeology 2013a, 2013b).
- 4.3.10 The substantial, mixed assemblage of handaxes also recovered from Area 240 may be of older Lower Palaeolithic origin (e.g. >MIS 9) or may date to the Later Middle Palaeolithic when technologically similar artefacts were made (c. MIS 3) (Boismier *et al.*, 2012). However, based on palaeoenvironmental and sedimentological evidence an Early Middle Palaeolithic date is most likely (Tizzard *et al.*, 2015).
- 4.3.11 Palaeogeographically, Area 240 is one of the most northerly Neanderthal sites in north-west Europe and of primary archaeological importance for defining Middle Palaeolithic potential and the contemporary palaeogeography across the southern North Sea basin (Tizzard *et al.*, 2014).
- 4.3.12 During MIS 6, the Weald-Artois ridge, located between south-east England and northern France, was finally breached creating the Dover Strait (Toucanne *et al.*, 2009), occurring within a trend towards increasingly restricted access to Britain (Ashton *et al.*, 2011; Scott and Ashton, 2011).

4.3.13 Currently there is no definitive evidence of a hominin presence in Britain during MIS 5 (Lewis *et al.*, 2011). Within the context of early prehistory and submerged palaeogeography however, substantial areas of the southern North Sea basin would have been dry land during the warming and cooling limbs¹ of the various sub-stages (MIS 5a to 5e) (**Figure 2**). Therefore potential exists for human activity to have occurred in Doggerland, the area of exposed terrestrial environment within the southern North Sea basin during and after the Devensian glaciation. Offshore locations may be the only source for testing this hypothesis (Wessex Archaeology 2013b); the western European archaeological record is rich in comparison for MIS 5 (Lewis *et al.*, 2011; Pettitt and White, 2012).

Late Middle Palaeolithic (c. 60,000 – 34,000 BP; MIS 3)

4.3.14 Again, East Anglia provides early evidence for Neanderthal recolonisation of Britain after the hiatus between MIS 6 to 4, around 60,000 BP. The Lynford Quarry material highlights a new lithic technology visually similar to Lower Palaeolithic Acheulean lithics, so-called Mousterian of Acheulean Tradition handaxes and tools (Boismier *et al.*, 2012). Climatically, MIS 3 was significantly colder than now but did not attain the glacial conditions of later or earlier glacial periods (e.g. MIS 6 or 2) (Pettitt and White, 2012). For the Neanderthals that may have occupied the region at this time, surviving in Doggerland during this period may have been subject to a variety of technological and cultural adaptations (White, 2006).

4.3.15 Recent analysis suggests Neanderthals died out in Britain around 42,000 years ago, with modern Humans arriving around 34,000 years ago (Jacobi and Higham, 2011).

Upper Palaeolithic (34,000 – 10,500 BP; MIS 3 – 2)

4.3.16 The Upper Palaeolithic straddles the Devensian glaciation with a hiatus in human activity in Britain between 24,000 and 15,000 BP (Pettitt and White, 2012; Jacobi and Higham, 2011). Recent analysis has suggested that eight relatively brief phases of human activity are represented by the existing Upper Palaeolithic archaeological record (Jacobi and Higham, 2011); with six occurring before the Devensian glacial maximum.

4.3.17 The onshore archaeological record of Upper Palaeolithic activity is relatively sparse, and offshore locations may provide unique and important context for coastal and lowland human activity during this period (Wessex Archaeology, 2013b). For example, a Maglemosian harpoon artefact from trawled peat in the early 20th century was subsequently radiocarbon dated to around 12,000 years ago (Houseley, 1991), and archaeological and palaeoenvironmental material has been reported from North Sea contexts for over a century (Reid, 1913; Godwin and Godwin, 1933).

Mesolithic (10,500 – 6,000 BP)

4.3.18 Considerable attention has been paid to Mesolithic Doggerland in the last decade (Gaffney *et al.*, 2007; Tappin *et al.*, 2011) and the geoarchaeology (Boomer *et al.*, 2007), submerged forests (Hazell, 2008) and palaeo-river systems around the current North Sea coast (Wessex Archaeology, 2013a; Limpenny *et al.*, 2011; EMU, 2009). Increasingly, a maritime perspective has developed for understanding the early prehistoric archaeological record, where coasts, estuaries and wetlands are key landscape elements (Ransley *et al.*, 2013).

¹ 'Limbs' refers to the edges of the peaks and troughs of the relative sea level curve.

- 4.3.19 It is clear from numerous research and development-led investigations that postglacial marine transgression has not destroyed Pleistocene and Holocene palaeogeography by default (Wessex Archaeology, 2013b). Areas of preserved palaeogeographic features do remain, and detailed reconstructions of palaeoenvironments and palaeogeography can be achieved for large parts of the North Sea basin (Tappin *et al.*, 2011; Limpenny, 2011; Dix and Sturt, 2011). By the early Holocene, Mesolithic hunter-fisher-gatherers in Doggerland were active in a familiar ecosystem of mixed deciduous woodland with oak, elm, alder and lime populated by deer and a wide variety of other mammals (Tappin *et al.*, 2011).
- 4.3.20 Post the Holocene marine transgression, the archaeological potential of the southern North Sea, including the study area, shifts to the maritime history of the UK which is presented in **Appendix IX** and summarised in **Section 5.3**.

5 ARCHAEOLOGICAL ASSESSMENT OF MARITIME AND AVIATION SITES

5.1 Introduction

- 5.1.1 The following assessment of the maritime resource is based on records of known shipwrecks, aircraft crash sites and obstructions combined with recent archaeological assessments of geophysical data.

5.2 Geophysical Seabed Features Assessment

Introduction

- 5.2.1 An archaeological assessment of 2016 and 2012 geophysical survey datasets was undertaken by Wessex Archaeology (**Figures 11, 12 and 13a-h**). Within the study area, a total of 1,475 geophysical anomalies were identified within the geophysical data after the grouping and discrimination phase. A full gazetteer of anomalies is presented in **Appendix VI, VII and VIII**.

- 5.2.2 These anomalies are discussed below, separately for each project element; NV East, NV West and the provisional OCC. Any sites from the 2014 former East Anglia Zone OFTO assessment that fall within the study areas (**Figure 1**) have been included in the results.

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- 5.2.3 An archaeological assessment of 2012 geophysical survey datasets was undertaken by Wessex Archaeology in 2014 and the results are described below. A full gazetteer of all anomalies is supplied in **Appendix VI** and examples of anomalies are illustrated in **Figure 11**. Wrecks are illustrated in detail in **Sheets 1 to 3**.
- 5.2.4 There are currently no sites within NV East that are subject to statutory protection from the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1979; the three legislative acts that could be used to protect marine archaeological sites.
- 5.2.5 In total 318 features of archaeological potential have been identified within NV East by Wessex Archaeology. These are discriminated as shown in **Table 7**.



Table 7: Features of archaeological potential within NV East

| Archaeological Discrimination | Quantity | Interpretation |
|-------------------------------|------------|---|
| A1 | 4 | Anthropogenic origin of archaeological interest |
| A2 | 313 | Uncertain origin of possible archaeological interest |
| A3 | 1 | Historic record of possible archaeological interest with no corresponding geophysical anomaly |
| Total | 318 | |

5.2.6 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance.

Table 8: Types of feature identified

| Feature Classification | Quantity |
|------------------------|------------|
| Wreck | 4 |
| Debris | 16 |
| Debris Field | 6 |
| Seafloor Disturbance | 17 |
| Bright Reflector | 4 |
| Dark Reflector | 116 |
| Rope/Chain | 11 |
| Magnetic | 143 |
| Recorded obstruction | 1 |
| Total | 318 |

5.2.7 There are three charted wrecks (**70021**, **70255**, and **70262**) and one charted obstruction (**70079**) located within NV East. In addition, there is one charted wreck (**71480**) that lies just outside NV East. The recommended Archaeological Exclusion Zone (see **Section 10.2**) around this feature does encroach into NV East and hence this wreck is included in the assessment.

5.2.8 There are no known aircraft crash sites located within NV East.

5.2.9 Anomaly **70021 (Sheet 1)** is a partially buried wreck located in the northern half of NV East approximately 700m from the development boundary. An elongated, discrete, oval shaped area measuring 21.5 x 9.7 x 0.6m contains several linear and rectilinear dark reflectors showing degrading structure of a wreck partially buried in sediment. Two further pieces of debris lie within 10m of the main wreck site and they are approximately 5.5 x 0.5m and 2 x 0.5m in size. As the wreck is partially buried, not enough of the superstructure is visible to ascertain which orientation the wreck is lying in but it is possible that the remaining wreck survives buried and intact.

5.2.10 Two magnetic anomalies, a very distinct medium sized asymmetric dipole anomaly of 62nT and approximately 50m to the south and possibly associated a second magnetic small and wide dipole of 19nT, suggests the presence of ferrous material. The wreck is visible in the multibeam bathymetry data as an elongated mound and located at the edge of a sandwave in an area of sand ripples.



- 5.2.11 The wreck is uncharted and not recorded in the UKHO database. The dimensions of the vessel should be taken as a minimum as the remainder of the wreck is potentially buried and surviving intact.
- 5.2.12 Anomaly **70255 (Sheet 2)** is a badly damaged and partially buried wreck in the southern half of NV East. The main wreck anomaly is of a discrete irregular shaped area in soft sediment containing one prominent L-shaped dark reflector which looks structural and numerous linear and curvilinear dark reflectors scattered around. The wreck measures 60 x 22 x 1.5m and is orientated north-west to south-east. In the multibeam bathymetry data is a rounded mound in area of sand ripples measuring 7.5 x 6 x 1.3m and possibly represents a larger upstanding piece of the wreck. A significant amount of ferrous material is suggested by a very strong magnetic anomaly of 2879nT.
- 5.2.13 To the north-east, south-east and west are five pieces of debris visible but there is the possibility of further debris buried in the surrounding built up sediment. Associated wreck debris ranges from 1.5 x 1m in size to 23.5 x 4m for a discrete area containing more than one piece of debris.
- 5.2.14 There is potentially debris up to 125m away from main wreck site. Anomalies **70248** and **70253** are single pieces of debris potentially associated with this wreck and together all three cluster in this area to the north-east of the main wreck site. Anomaly **70250** is a discrete area containing at least five small approximately circular dark reflectors ranging from 0.5 to 2.5m in size.
- 5.2.15 Approximately 35m to the south-east of the wreck anomaly is the charted location of a wreck whose description and dimensions correspond to anomaly **70255**. This charted wreck is included in the UKHO database (ID 11213). It is described as an unknown wreck, first detected in 1994 with the surveyed position of this wreck regarded as having an accuracy of 15m. The survey data indicates the presence of an entire wreck, largely buried, lying just below the crest of an adjacent sandwave. Only a small portion of the wreck was observed standing above the seabed level. The wreck is thought to be orientated south-east to north-west measuring 35 x 5 x 2.9m, the orientation and description of only one portion of the wreck upstanding corresponds to the results from the 2012 data. Magnetometer data indicates that the wreck extends to the south-east for approximately 40m.
- 5.2.16 The difference in positioning between the UKHO wreck and the wreck anomaly seen in the 2012 data is approximately 35m but it is located at the south-east end of the wreck which is a small irregular shaped area 7.5 x 4 x 0.5m containing diffuse dark reflectors, potentially structural. Potentially this is one end of the wreck site with the rest significantly buried; this would increase the length of the wreck to 60m. Another possible explanation is that from the UKHO description from 1994 the wreck is described as lying just below the crest of an adjacent sandwave, the surrounding environment visible in the sidescan sonar and multibeam bathymetry data shows the wreck lying in an area of sand ripples with sandwaves approximately 100m north and south of the wreck. It is possible that more of the wreck has been uncovered with the movement of the sediments in the area therefore a new position for this charted wreck is given at the location where the bulk of the wreck material is now visible. There is also the possibility that it is partly to do with differences in the positional accuracy, stated above in the UKHO description as having an accuracy of 15m.
- 5.2.17 Anomaly **70262 (Sheet 3)** is an intact wreck, lying on its side and partially buried and located in the southern half of NV East. The wreck is visible in the sidescan sonar data as a discrete area 33 x 8 x 1.7m containing several interconnecting curvilinear and rectilinear

dark reflectors and showing structure of a wreck lying on its side, partially buried in sediment that graduates from finer grained sand ripples to coarser sediment. The wreck is nearly wholly buried but appears to be upright as complex detail looks like deck structure; it is orientated north-west to south-east. The multibeam bathymetry data shows an elongated oval shaped area with scour extending to the north for approximately 100m, possibly showing the more extant section of the wreck site.

- 5.2.18 There are two further anomalies to the east and south-east of wreck **70262** that are possibly associated debris. Anomaly **70263** has dimensions of 1.1 x 0.6 x 0.2m and anomaly **70265** is larger at 2.6 x 1.2 x 0.0m. Both are oval shaped dark reflectors. The strongest associated magnetic contact at the location of wreck **70262** is a large negative monopole anomaly of 153nT suggesting the presence of ferrous material.
- 5.2.19 This wreck is charted and included in the UKHO database (ID 11214), it is an unknown wreck first detected in 1994. Survey data from 1994 indicates that the wreck is small and present in its entirety lying NW/SE, although it is broken up, it measures 30 x 5 x 0.6m. A magnetic anomaly associated with the wreck was also observed. The surveyed position of this wreck is regarded as having an accuracy of 13m. The 2012 geophysical data shows the wreck at the same location as the charted wreck, with similar dimensions.
- 5.2.20 Wreck **71480** lies outside NV East but is included in this assessment as the recommended Archaeological Exclusion Zone (AEZ) extends into the NV East area by up to 30m (**Figure 11**). This feature is the wreck of a submarine and the UKHO (ID 79542) records that it was last observed in September 2014 with dimensions of 58 x 6.5 x 5m and lying 020/200 with the bow to the south. A strong magnetic anomaly was also recorded. In the 2012 geophysical data the wreck was observed with dimensions of 63.2 x 5.8 x 4.4m and with a magnetic anomaly of 600nT. Surrounding debris increases the dimensions of the site to 64 x 20 x 4.4m.
- 5.2.21 Anomaly **70058** is an extremely strong magnetic anomaly of 6587nT, it is a very large dipole, possibly suggestive of a wreck anomaly with a significant amount of ferrous material in its construction and / or cargo but there is no sidescan sonar or bathymetry anomaly visible at this location and there are no recorded wrecks or obstructions. There is the possibility that if it is a wreck site then it is completely buried, the sidescan sonar and multibeam bathymetry data both show an environment of sand ripples.
- 5.2.22 There are no recorded wrecks and one recorded obstruction that have not been identified in the geophysical data. Anomaly **70079** is an unidentified obstruction which has been identified by previous geophysical survey and was first detected in 1994. Survey data indicated the presence of a very small contact with dimensions of 2 x 1 x 0.8m with no associated magnetic anomaly. The surveyed position of this obstruction is regarded as having an accuracy of 13m. No geophysical anomaly was identified at this location and it is possible that the object has since become buried.
- 5.2.23 A total of 313 anomalies have been interpreted as A2 – uncertain origin of possible archaeological interest.
- 5.2.24 There are 16 pieces of debris identified in NV East which have been assigned an archaeological potential of A2 due to their anthropogenic appearance and characteristics. The anomalies vary in size and character and are characterised as debris, as opposed to debris fields, as they are single anomalies interpreted as one or possibly two objects at the most and are more complex in appearance. A selected range of these debris remains are described below.



- 5.2.25 Anomalies **70253**, **70263** and **70265** are all pieces of debris that have been associated with wrecks. They range from being linear to circular in shape and from 1.1 x 0.6 x 0.2m to 9.4 x 2.9 x 0.1m in size. Their locations in the immediate vicinity of a wreck site potentially indicate their origin as wreck debris or cargo. None of them have a magnetic contact to indicate the presence of ferrous material.
- 5.2.26 The remaining debris anomalies range in size from 1.1m in length for anomaly **70263** to 16.3m in length for anomaly **70273**. Further anomalies such as **70305** are typically characterised as items of debris being rectangular in shape where some detail can be discerned suggesting an anthropogenic origin.
- 5.2.27 Anomaly **70312** is an irregular shaped discrete area 15.5 x 12.5 x 0.4m containing a complex anomaly of numerous dark reflectors that suggest structure but of weak contrast. It appears to be broken up and damaged but partially buried so difficult to see its full condition, true extent is unknown. It is an amorphous shaped anomaly measuring 12.3 x 7.3 x 1m and is visible in the multibeam bathymetry data possibly suggesting area where height is surviving to greatest extent. Although no direct magnetic contact has been identified at this location it is situated in trend of high magnetic anomalies and therefore the presence of magnetic material cannot be ruled out.
- 5.2.28 Four of the debris anomalies are dark reflectors that have an associated magnetic contact suggesting that they contain ferrous material. Anomaly **70230** is a pair of dark reflectors, one linear and the other curvilinear with a weak magnetic dipole of 6nT. Anomaly **70187** is a pair of two thick curvilinear dark reflectors approximately 13m apart and 4.4m in length with a significant magnetic dipole of 65nT. Finally, **70188** is a discrete area containing three curvilinear dark reflectors which are possibly all part of the same object as they appear partially buried in sediment. A magnetic contact of 20nT suggests ferrous material in their construction.
- 5.2.29 Six anomalies have been characterised as debris fields on the basis that they are discrete areas containing more than two pieces of debris; they are typically larger areas in size than of single pieces of debris. The six debris fields have been assigned an archaeological potential of A2 due to their anthropogenic appearance and characteristics.
- 5.2.30 The debris fields range in size from 4.7 x 2.9 x 0.1m for anomaly **70282** which is an area containing four small curvilinear dark reflectors possibly individual pieces of debris to anomaly **70202**. Anomaly **70202** is an irregular shaped discrete area 25 x 12 x 0.8m, partially visible in the bathy as an elongated mound overlying sand ripples and measuring 12 x 3.8 x 0.9m. The area contains one major curvilinear and several narrow curvilinear dark reflectors with no obvious structure but from size and appearance it is possibly partially buried debris.
- 5.2.31 There are four anomalies characterised as bright reflectors indicating their possible construction of a material such as plastic, rubber, wood or potentially fibreglass. They have all been assigned an archaeological discrimination of A2 and none have an associated magnetic contact to indicate the presence of ferrous material.
- 5.2.32 Anomaly **70068** is a single bright reflector measuring 4.7 x 3.4 x 0.5m and is visible in the multibeam bathymetry data highlighting the scour associated with the object.
- 5.2.33 There are 116 anomalies identified and characterised as dark reflectors. These anomalies are typically single reflectors, simple in shape such as linear, circular or oval with no complex detail or structure visible. The dark reflectors range in size from anomaly **70001**, an approximately oval-shaped anomaly measuring 0.8 x 0.5 x 0.1m to anomaly **70268** a



discreet elongated area with dimensions of 40 x 3.5 x 0.2m containing four anomalies forming a roughly linear orientation from north to south. The individual anomalies range in size from 4.5 x 3.5 x 0.2m to 1.8 x 0.8 x 0.1m.

- 5.2.34 Eleven anomalies are identified and characterised as possible lengths of rope or chain. They have been assigned an archaeological discrimination of A2. Two of the anomalies have associated magnetic contacts suggesting that they are partly or wholly of ferrous construction, these are **70071** and **70111**. The anomalies range from 6.3 to 130m in length with the majority of the anomalies over 40m in length and typically intermittent lengths of short, linear dark reflectors suggesting that they are becoming progressively buried. It is possible that these may be the remains of decommissioned cables in the region.
- 5.2.35 There are 17 seafloor disturbances recorded in NV East. A seafloor disturbance is an area of seabed that appears disturbed, potentially by a buried or partially buried wreck or debris of archaeological interest. These types of features may be groups of what is apparently debris or may be more ephemeral and consist solely of a patch of bright and dark reflectors distinct from the surrounding seabed.
- 5.2.36 The features vary in size from 3 x 2.9 x 0.5m (**70038**) up to 65 x 11.5 x 1.1m (**70303**). They generally are made up of multiple dark and bright reflectors, hard edged and also diffuse anomalies that look anomalous and are spread across the seabed. Two of the recorded seafloor disturbances have associated magnetic anomalies, these are **70210** (13nT) and **70024** (19nT), and this suggests the presence of ferrous material.
- 5.2.37 The following four anomalies are particularly distinct. Anomaly **70040** is a mounded area with a scour measuring 8.7 x 4.9 x 0.6m observed in the sidescan sonar data. The multibeam bathymetry data shows a small depression in an area of sand ripples, which corresponds to the location of the scour but the mounded area is not visible within it.
- 5.2.38 Anomaly **70042** is a strong curvilinear dark reflector with no complex detail visible suggesting structure but it is a large object partially buried in sediment, possibly the outline structure of a large object or wreck. The area of seafloor disturbance measures approximately 17.9 x 5.7 x 0.7m and there is no magnetic contact at this location to indicate the presence of ferrous material.
- 5.2.39 Anomaly **70168** is a discrete area containing numerous small circular and short linear dark reflectors that are randomly ordered and not of uniform size and orientation. This is possibly debris but is badly degraded and broken up with no obvious structure visible to identify it as a wreck and no associated magnetic contact to indicate the presence of ferrous material.
- 5.2.40 Anomaly **70203** is a discrete area containing at least three curvilinear regular spaced dark reflectors with scour observed associated with each reflector. The regularly spaced dark reflectors could be interpreted as possibly structural but not enough complex detail can be seen. In bathymetry data it is visible as an elongated depression cutting through area of slightly raised seabed. The anomaly measures 16 x 5.8 x 0.5m.
- 5.2.41 There are 143 magnetic anomalies across NV East which have no sidescan sonar or bathymetry anomalies visible at their locations. Anomaly **70058** (6587nT) which is potentially indicative of a wreck or large amount of debris has been assigned an archaeological discrimination of A1 and is described above. Therefore there are 142 magnetic anomalies with an archaeological discrimination of A2. They are difficult to characterise further other than that they are the locations of potential debris or wrecks that



are wholly buried in the highly mobile sediment visible across the development area. As they are not able to be characterised further they could also potentially be natural in origin and the response of features such as boulders.

- 5.2.42 Magnetic anomalies which formed larger linear or curvilinear features such as those in response to sandwaves or sandbanks have been removed as they are natural in origin. A large number of anomalies were identified which were then also removed as they followed the location of charted cables or their linear alignment across hundreds of metres inferred that they were man-made features such as a cable or pipeline.
- 5.2.43 The magnetic anomalies vary greatly in strength from the weak asymmetric dipolar anomaly **70015** with magnetic amplitude of 5nT (the minimum size recorded) to the extremely distinct dipolar anomaly **70035** with a magnetic strength of 674nT.

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- 5.2.44 An archaeological assessment of 2016 geophysical survey datasets was undertaken by Wessex Archaeology across NV West and the results are described below. A full gazetteer of all anomalies is supplied in **Appendix VII** and examples of anomalies are illustrated in **Figure 12**. The wreck is illustrated in detail in **Sheet 4**.
- 5.2.45 There are currently no sites within NV West that are subject to statutory protection from the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1979; the three legislative acts that could be used to protect marine archaeological sites.
- 5.2.46 In total 184 features of archaeological potential have been identified within NV West by Wessex Archaeology. These are discriminated as shown in **Table 9**.

Table 9: Features of archaeological potential within NV West

| Archaeological Discrimination | Quantity | Interpretation |
|-------------------------------|------------|---|
| A1 | 11 | Anthropogenic origin of archaeological interest |
| A2 | 172 | Uncertain origin of possible archaeological interest |
| A3 | 1 | Historic record of possible archaeological interest with no corresponding geophysical anomaly |
| Total | 184 | |

- 5.2.47 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance.

Table 10: Types of feature identified

| Feature Classification | Quantity |
|------------------------|----------|
| Wreck | 1 |
| Debris | 21 |
| Debris Field | 14 |
| Seafloor Disturbance | 13 |
| Bright Reflector | 15 |
| Dark reflector | 79 |
| Rope/chain | 2 |



| | |
|--------------|------------|
| Mound | 1 |
| Magnetic | 37 |
| Obstruction | 1 |
| Total | 184 |

- 5.2.48 There is one charted wreck (**71334**) and one recorded obstruction (**71377**) located within NV West.
- 5.2.49 There are no known aircraft crash sites located within NV West.
- 5.2.50 From the geophysical assessment there are 11 features discriminated as A1 within NV West, one of these is a wreck (**71334**), three pieces of associated wreck debris, a debris field and six magnetic anomalies (**Appendix VII**).
- 5.2.51 One recorded wreck (**71334**) has been identified within NV West (**Sheet 4**). The wreck is visible in the sidescan sonar data as a large spread of debris features comprising mainly linear and curvilinear thin dark reflectors with height in an area of sandwaves. The overall dimensions of the debris spread are 54 x 41.2 x 0.6m, with the longest individual feature measuring 12m. The wreck appears to be very broken up and degraded with no identifiable structure visible and the full extent of the wreck may be buried by sands. In the bathymetry data this wreck is observed as an irregular mound measuring 28 x 18m within an area of sandwaves and aligned north-east to south-west. There is a very large magnetic anomaly measuring 5974nT associated with this wreck, indicating a substantial quantity of ferrous material. The magnetic anomaly is noisy and widely spaced in the data, with a possible slight positioning error between lines of data, or a possible indication of buried material extending beyond the boundaries identified on the sonar data. In the UKHO data (record 11190) this wreck is listed as an unidentified non-dangerous wreck, well buried and almost flush with the seabed with only the upper structure visible and dimensions of 38 x 15m.
- 5.2.52 Three pieces of debris possibly associated with this wreck have been discriminated as A1. Debris **71332** is located 45m north-west of the wreck and is visible in the sidescan sonar data as a long and thick curvilinear dark reflector with a bright shadow and dimensions of 4.6 x 1.8 x 0.3m. Debris **71333** is located 36m to the east of wreck **71334**. This is a long and thin linear dark reflector with a dull shadow and dimensions of 5.3 x 0.4 x 0.1m. The third piece of possible wreck debris is **71336**, located 35m to the south of the wreck. This is a long and very thin indistinct dark reflector with a slight shadow in the sidescan sonar data and dimensions of 3.6 x 0.2 x 0.2m. None of these debris features have magnetic anomalies associated with them, however any magnetic anomaly here is likely to have been masked by the very large anomaly associated with the main area of wreckage. All of these pieces of debris possibly associated with wreck **71334** have been identified in an area of sandwaves and there is a possibility that there may be further buried debris in the vicinity of the wreck.
- 5.2.53 Debris field **71301** is located in the north-east area of NV West and has been given an archaeological discrimination of A1. In the sidescan sonar data this feature is discernible as several distinct linear dark reflectors with height situated in an area of megaripples and with dimensions of 23 x 0.9 x 0.2m (**Figure 14**). The largest individual dark reflector measures 7.6m length. The objects appear to be in a line therefore possibly represent one, partially buried feature such as a possible wreck and, as such, have been grouped together as one debris field. The debris field has a very large associated magnetic anomaly measuring 7022nT, indicating substantial ferrous material is present.



- 5.2.54 There are six magnetic anomalies with no associated surface expression discriminated as A1 within NV West. Magnetic anomaly **71297** is visible as a very large asymmetric dipole and measures 953nT. This is located in the north-east corner of the survey area and identified on more than one survey line. Magnetic anomaly **71299** is visible as a very large asymmetric dipole in a single line of data and measures 1450nT. This anomaly is located in the north-east of NV West and lies approximately 180m west of a charted pipeline, but is not part of the linear anomaly associated with it. Magnetic anomaly **71314** measures 896nT and is visible as a large asymmetric dipole only identified on one survey line. Anomaly **71479** is located in the south-west corner of NV West and measures 4455nT. This is visible in the magnetic profile as a very large dipole. Two very large magnetic anomalies are possibly associated with wreck **71334** in the north-east corner of the survey area. Anomaly **71323** measures 1320nT and is located 450m to the north-east of the wreck while magnetic anomaly **71325** measures 1127nT and is located 215m to the north-east of the wreck. All of these magnetic anomalies with no associated seabed feature have the potential to be substantial buried ferrous debris.
- 5.2.55 A total of 172 anomalies have been interpreted as A2 – uncertain origin of possible archaeological interest.
- 5.2.56 There are 21 pieces of debris recorded across NV West that have been discriminated as A2 (**Appendix VII**). The largest of these is a linear piece of debris (**71362**) situated in the northern extent of NV West with dimensions of 20.1 x 0.9 x 0.2m. This is visible in the sidescan sonar data as a very long and thin slightly curvilinear shaped dark reflector with a bright and short shadow. This debris is located in an area of sandwaves and may be partially buried.
- 5.2.57 The smallest piece of debris recorded is ferrous debris **71455** identified in the southern extent of NV West. The debris has dimensions of 1.7 x 0.5 x 1.1m and is visible in the sidescan data as a very thin, linear dark reflector with a bright and distinct shadow. This feature is also observed as a small, rounded mound in the bathymetry data measuring 3 x 3 x 0.2m. The debris has a large magnetic anomaly measuring 239nT associated indicating it is ferrous. It is located 27m south-west from debris field **71453** and may be related.
- 5.2.58 Two further pieces of debris have been interpreted to contain ferrous material. Debris **71456** is located in the southern extent of NV West and is visible in the sidescan sonar data as a rectangular shaped dark reflector with a bright and tapered shadow. The debris has dimensions of 2.9 x 1.3 x 0.4m, it is isolated and distinct on a sandwave rich area of the seabed. This has a small magnetic anomaly measuring 38nT associated indicating some ferrous material is present.
- 5.2.59 Ferrous debris **71352** is located in the northern extent of NV West and is visible in the sidescan sonar data as an indistinct dark reflector with dimensions of 4.3 x 3m and no discernible height. This is an irregularly shaped feature that may be partially buried by sands. It has been identified approximately 10m east south-east of a medium magnetic anomaly measuring 84nT and may be associated. Debris field **71353**, located 25m to the west of **71352**, also shares this magnetic anomaly as it is not possible to discern which feature, if any, it is associated with given the magnetometer line spacing. A dark reflector (**71351**) has also been identified 6m to the east of this ferrous debris. All of these features in this area may be related.
- 5.2.60 A total of 13 debris fields discriminated as A2 have been identified across NV West (**Appendix VII**). Debris field **71361** is located in the centre of the northern half of the survey area. The feature comprises a large area of partially buried debris features that

have an anthropogenic appearance. In the sidescan sonar data the feature comprises an almost structural looking right angled linear dark reflector with bright shadows and smaller possible associated debris in the surrounding sands. The debris field has dimensions of 40.8 x 15.3 x 0.6m and is not visible in the bathymetry data.

- 5.2.61 Ferrous debris field **71453** is situated in the southern extent of NV West. This has been identified in the sidescan data as a large scatter of potential debris comprising approximately 10 dark reflector anomalies, some with shadows and some without (**Figure 14**). The exposed dimensions of the debris field are 33.5 x 17.1 x 0.3m. The features are variable in their appearance with some rounded, linear and square objects visible within an area of sandwaves. The largest feature measures 4.1 x 2.5m and further anomalies may be buried by sands. This debris field has a large magnetic anomaly measuring 239nT associated indicating ferrous debris is present. In the bathymetry data this is visible as an irregular mound with dimensions of 26 x 10 x 0.5m.
- 5.2.62 Ferrous debris field **71412** is situated in the centre of NV West. This has dimensions of 22.2 x 9.8 x 0.5m and is visible in the sidescan sonar data as a large spread of approximately nine dark reflectors of various shapes and sizes, the largest measures 3.8 x 2m. The full extent of this debris may be buried by sands. There is a small magnetic anomaly measuring 26nT associated with this debris field indicating some ferrous material is present.
- 5.2.63 In total, 13 areas of seafloor disturbance have been identified within NV West. All of these have an archaeological discrimination rating of A2 and none have an associated magnetic contact to indicate the presence of ferrous material. The largest area of seafloor disturbance is **71444** located in the south-west area of NV West. This feature is visible in the sidescan sonar data as a large oval shaped area of irregular seabed comprising many small bright reflectors and some dark reflectors with overall dimensions of 28.5 x 18.2m. The feature is situated in a rough and sandwave rich area of the seabed.
- 5.2.64 Seafloor disturbance **71395** is located in the north-west corner of NV West. In the sidescan data the anomaly is visible as a distinct and large area of disturbed seabed, with dimensions of 17.6 x 4.1 x 0.9m. There is a main, slightly bulbous bright reflector with two curvilinear features exposed directly next to this, one a bright reflector and one a thin, dark reflector with a shadow. This feature is located in an uneven and sandwave rich area of the seabed and appears to be highly anomalous (**Figure 15**).
- 5.2.65 Feature **71324** is a distinct, medium sized patch of seafloor disturbance cutting through large sandwaves, with dimensions of 14.6 x 10.3 x 0.5m. The anomaly comprises a group of irregularly shaped dark reflectors, some with slight height, and some indistinct bright reflectors. There is one particularly distinct feature exposed in the centre which measures 4.9 x 0.9m, with a height of 0.5m. The seafloor disturbance is visible in the bathymetry data as an indistinct, rounded mound with a slight surrounding sediment build-up and dimensions of 16 x 14 x 0.7m.
- 5.2.66 A total of 15 bright reflector anomalies have been identified across NV West. These have all been assigned an archaeological discrimination of A2 and none have an associated magnetic contact to indicate the presence of ferrous material. The largest bright reflector (**71363**) has been identified in the north-east of the area. This has dimensions of 12.3 x 6m and is visible in the sidescan sonar data as an indistinct, elongated bright reflector in an 'x' shape. The smallest bright reflector (**71450**) is located in the south-west area of NV West, this is visible in the sidescan data as a slightly oval shaped feature with no obvious object in front and dimensions of 3.7 x 1m. Another example is **71329**, which is a small

and irregular bright reflector with dimensions of 4.2 x 1.9m (**Figure 15**). It was identified in an area of megaripples in the north of NV West.

- 5.2.67 Two possible rope or chain features have been identified within NV West. Both of these have been discriminated as A2 and neither have magnetic anomalies associated. Feature **71398** is located in the eastern extent of NV West. This is a very long and thin curvilinear dark reflector, with a bright reflector at the front in the central section and dimensions of 44.4 x 0.7m. The feature is indistinct in parts across its extent.
- 5.2.68 Anomaly **71367** is located in the northern section of NV West. This appears in the sidescan data as a partially buried or broken up thin linear dark reflector with a shadow, located within sandwaves. It has dimensions of 12.7 x 0.6 x 0.1m and is quite distinct.
- 5.2.69 There are 79 dark reflector features recorded across the NV West (**Appendix VII**). All of these are discriminated as A2 and have no associated magnetic anomaly. These anomalies are typically single reflectors, simple in shape such as linear, circular or oval with no complex detail or structure visible. The features identified vary greatly in size. The smallest is **71389**, a linear dark reflector with no shadow with dimensions of 2.3 x 0.5m. It is an isolated and distinct feature located within sandwaves. Dark reflector **71414** is the largest feature identified with dimensions of 31.2 x 0.8m. This is visible in the sidescan sonar data as a long, thin and slightly curvilinear dark reflector with no shadow.
- 5.2.70 One mound, **71458**, has been identified within NV West and discriminated as A2. This is located in the southern extent of the survey area (**Figure 15**). The mound is visible as a large, slightly curvilinear dark reflector that is wider but more indistinct at one end than the other with a large dull shadow in the sidescan sonar data. In the bathymetry data the feature is discernible as a long, tapering mound of sloping height, aligned north-west to south-east. The mound is located within sandwaves but on a different alignment and has dimensions of 21.3 x 7 x 0.5m.
- 5.2.71 There are 30 magnetic anomalies with no sidescan sonar feature associated across NV West. All of these have been given an archaeological discrimination of A2 (see **Appendix X.3**). These have been categorised as small magnetic anomalies of less than 50nT; medium sized magnetic anomalies of 50nT to 200nT, large magnetic anomalies of 201nT to 900nT and very large of over 900nT. Background magnetic variation caused by geology is approximately ± 5 nT and as such smaller anomalies recorded across the survey areas may prove to be geological in origin and likewise small anomalies may also be masked by this geological variation. All of the magnetic anomalies classified as A2 have the possibility to be buried objects with ferrous content that are of archaeological potential.
- 5.2.72 There are four small magnetic anomalies ranging from 33nT to 44nT, 18 medium sized magnetic anomalies ranging from 51nT to 177nT and nine large anomalies ranging from 218nT to 620nT (**Appendix VII**). These features, especially the large anomalies, have the potential to be substantial buried ferrous debris.
- 5.2.73 One historic record of an obstruction, **71377** is located within NV West and is discriminated as A3. UKHO record 11236 describes an area of foul ground at this location, however nothing anthropogenic was identified here in the geophysical data.

Provisional Offshore Cable Corridor

- 5.2.74 An archaeological assessment of 2016 geophysical survey datasets and anomalies identified in the former East Anglia Zone OFTO survey that fall within the current survey areas was undertaken by Wessex Archaeology across the provisional OCC and the results are described below. A full gazetteer of all anomalies is supplied in **Appendix VIII**



and examples of anomalies are illustrated in (**Figure 13a-h**). Wrecks are illustrated in detail in **Sheets 5 to 30**.

- 5.2.75 There are currently no sites within the provisional OCC that are subject to statutory protection from the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1979; the three legislative acts that could be used to protect marine archaeological sites.
- 5.2.76 In total 973 features of archaeological potential have been identified within the provisional OCC by Wessex Archaeology. These are discriminated as shown in **Table 11**.

Table 11: Features of archaeological potential within the provisional OCC

| Archaeological Discrimination | Quantity | Interpretation |
|-------------------------------|------------|--|
| A1 | 37 | Anthropogenic origin of archaeological interest |
| A2 | 936 | Uncertain origin of possible archaeological interest |
| Total | 973 | |

- 5.2.77 These anomalies have been classified by probable type, as shown in **Table 12**.

Table 12: Types of features identified

| Feature Classification | Quantity |
|------------------------|------------|
| Wreck | 26 |
| Debris | 79 |
| Debris Field | 39 |
| Seafloor Disturbance | 7 |
| Bright Reflector | 29 |
| Dark Reflector | 157 |
| Rope/chain | 36 |
| Mound | 10 |
| Magnetic | 590 |
| Total | 973 |

- 5.2.78 There are 26 charted wrecks situated within the provisional OCC, these are discriminated as A1 and detailed below.
- 5.2.79 There are no known aircraft crash sites located within Norfolk Vanguard East.
- 5.2.80 Anomaly **70342 (Sheet 5)** is associated with UKHO record 11091 for the *Golden Oriole* (possibly). The wreck is visible in the sidescan sonar data as a very indistinct expanse of wreckage. It consists of an oval shaped area of bright and dark reflectors, some with shadows and some without, lying perpendicular to the large sandwaves. The dimensions of the wreck are 33 x 14 x 1m. There is very little detail discernible in the data to identify this as a wreck and the full extent may be buried by sands. In the bathymetry data the wreck is observed as lying slightly perpendicular to the large sandwaves and may be partially masked by sediment. It is aligned north-east to south-west and visible as a long and thick linear mound with faint scouring to the north measuring 50m in length. There is a medium sized magnetic anomaly measuring 50nT associated with this wreck, though the



closest line of data is located 27m away. It is anticipated if the magnetometer had crossed directly over the wreck the anomaly amplitude would be much larger. This wreck is associated with the UKHO record 11091 for the *Golden Oriole* (possibly). This is a British trawler sunk on 22 January 1915. The wreck was previously observed in 2014 and was documented as being very broken up, with dimensions of 26 x 8.3 x 1.4m and having a large magnetic anomaly associated.

- 5.2.81 Anomaly **70360 (Wreck Sheet 6)** has been identified to be the HMS *Dunoon* (possibly) in the UKHO data (11093). In the sidescan sonar data the wreck is visible as a large area of debris features, including linear, curvilinear and smaller dark reflectors with shadows. It is located within sandwaves and the full extent of the wreck debris may be buried. The wreck has dimensions of 54 x 11 x 4m and the largest piece of discernible debris measures 5.8 x 1.4m. The wreck appears relatively intact but in poor condition, with little structural detail visible beyond the hull. There is some possible debris or broken off structure situated 40m north of one end of the vessel (**70361**). In the bathymetry data the wreck is seen to be aligned north-east to south-west and possibly has some debris or broken structure situated directly to the north-east end of the vessel. The wreck stands prominently upright on the seabed within large sandwaves and has a large amount of scouring orientated north to south and measuring over 300m in length. There is a very large magnetic anomaly associated measuring 15867nT indicating a ferrous structure. This wreck is associated with UKHO record (11093) of the HMS *Dunoon* (possibly), a 700-ton British minesweeper with original dimensions of 70.4 x 8.5 x 2.1m. The vessel was sunk by a mine on 30 May 1940. The wreck was last observed in 1986 as being relatively intact but damaged at the bow, with a length of 62m and a recorded height of 5.2m.
- 5.2.82 Anomaly **70459 (Sheet 7)** is the recorded wreck *Phillipp M* (UKHO 11092). In the sidescan sonar data the wreck is clearly broken in two and visible as a large spread of highly dispersed wreck debris. There is some structure and possible deck planking discernible as parallel dark reflectors with shadows. It is not clear which is the stern or bow end of the vessel, however the two hull sections appear to be largely intact. The full extent of the wreck is likely to be buried by the large sandwaves in the area. In the bathymetry data the wreck is also clearly lying in two parts, with a 17m gap between them and both sections orientated north-west to south-east. The wreck is situated in a large depression with clear scouring visible orientated north-west to south-east and measuring over 100m in length. The individual dimensions of the northern section are 41 x 23 x 10m and the southern section measures 44 x 19 x 8m. The combined dimensions are similar to the recorded construction dimensions of 80.5 x 11.9 x 7m. The wreck has a large magnetic anomaly associated measuring 775nT and indicating a ferrous composition. In the UKHO database this is recorded as *Phillipp M*, a steamship, which was torpedoed and sunk in 1944. The wreck is described as lying in two parts on the seabed, probably inverted, with measurements of 55 x 30 x 7.7m. It was last observed in 1999.
- 5.2.83 Anomaly **70565 (Sheet 8)** is a highly dispersed wreck. In the sidescan data the vessel is visible as several distinct dark reflectors, with broad shadows. The wreck appears to have a main central body with large bits broken off from the hull. The wreck is situated within the crest of a sandwave and the full extent is likely to be buried by sediments. In the bathymetry data the wreck appears to be broken up with large sections displaced from the main structure of the wreck, possible boilers can be seen as distinct peaks in the data. It is clearly within large sandwaves and partially buried by sediments. The vessel has dimensions of 70 x 31 x 6.3m. There is some scouring coming from the wreck extending to the south-east and measuring approximately 50m in length. A large magnetic anomaly measuring 200nT is associated indicating some ferrous content. In the UKHO record (10722) this is stated to be an unknown wreck with dimensions of 35 x 20 x 4.2m. It is described as being broken up and almost buried by sandwaves with the hull lying north-

west to south-east. Pieces of debris in the vicinity of the wreck are thought likely to be boilers and engines. The wreck has a large magnetic anomaly associated with it and it is reported to have last been observed in 2014.

- 5.2.84 Wreck **70617 (Sheet 9)** is a large wreck broken in two parts which lie perpendicular to one another on the seabed. In the sidescan sonar data the two parts of the hull appear to be intact and visible as thick and distinct linear dark reflectors. Within these some possible deck structure survives as straight, slatted dark reflector features with bright shadows. The area covered by the wrecks two parts measures 56.7 x 47 x 6.4m and it has a very large magnetic anomaly measuring 6367nT indicating a ferrous construction. In the bathymetry data the wreck is clearly broken in two parts with some standing structure visible. What appears to be the bow is orientated south-east to north-west and the stern lies west to east. The two parts measure 77m in length when added together in the multibeam data, close to the original build dimensions of 73.2m. The two pieces of the wreck are situated in a slight depression with some sediment build up. In the UKHO record (10544) this vessel is identified to be the *Rye*, a steamship with original dimensions of 73.2 x 10.4 x 4.6m. The vessel was built in 1924 by W Beardmoe & Co. It was owned at the time of loss by London, Midland and Scottish Railway and was sunk in 1941 by a torpedo. The wreck was last identified in 2014, when scouring was observed 2m deep and extending for 10m.
- 5.2.85 Wreck **70639 (Sheet 10)** is recorded wreck *Trevethoe* (UKHO 10546). In the sidescan sonar data the wreck appears to be highly dispersed across the seafloor with dimensions of 146.4 x 46.6 x 11.7m. The length is comparable to the build length (131.8m) but the width is more than double, which may suggest some of the structure has collapsed. A thick slightly curvilinear dark reflector, possibly the hull edge, is discernible but no structural elements or decking are clear. The wreck is comprised of numerous straight dark reflectors with shadows of varying lengths and widths. The vessel is orientated north-west to south-east and lies perpendicular to the large sandwaves. The full extent of the vessel is possibly covered by sands. The wreck has a possible associated piece of debris at its northern end (**70640**) which is a long, thin and indistinct linear dark reflector with a broad shadow, it has dimensions of 20.5 x 1.1 x 3.3m. It is possible that there may be more buried debris in the vicinity of the wreck and within the large sandwaves. The wreck has a large magnetic anomaly measuring 818nT associated, indicating a ferrous composition. In the bathymetry data the wreck appears upright with some superstructure visible, again there is evidence that parts of the hull have collapsed and the vessel is not intact. The UKHO records this wreck as the *Trevethoe*, a motor vessel built in Glasgow in 1940 with build dimensions of 131.8 x 17.1 x 7.5m. The vessel was sunk in 1941 after being attacked by E-boats. The wreck was last observed in 2014 as upright but collapsed in two parts with scour 2m deep and extending for 15m.
- 5.2.86 **70645 (Sheet 11)** is a medium sized wreck with dimensions of 24 x 8.5 x 5.4m. It is visible in the sidescan sonar data as a distinct, thick curvilinear dark reflector outline that is likely to be the hull, with some indistinct dark reflectors in its centre. There is no discernible deck structure visible in the data but the wreck has a broad, irregular and distinct shadow. The wreck is located in an area of megaripples and there is the possibility of associated debris being buried by sediments. The wreck is orientated north-east to south-west. In the bathymetry data this is visible as a large and distinct wreck lying in between large sandwaves. The wreck is intact and upright with some slight scouring orientated in the same direction and measuring 16m to either side. There is a medium magnetic anomaly measuring 52nT associated with this wreck indicating some ferrous debris, though the nearest line of data is 25m from the wrecks location and the amplitude would be expected to be higher if the magnetometer passed directly over the vessel. In the UKHO record



(82114) this is stated to be an unknown wreck that is largely intact and partially buried with dimensions of 24 x 10 x 4m.

- 5.2.87 **70659 (Sheet 12)** is a large wreck with dimensions of 56 x 22 x 6.7m. In the sidescan sonar data the wreck appears intact, situated on a rough and sandwave rich area of the seabed. The hull is clearly visible as long and thick slightly curvilinear dark reflectors. Within these there are long and thin linear slatted dark reflectors which are possibly deck structure. The vessel is possibly listing slightly to the starboard side and has a broad shadow. The full extent of the wreck may be buried by sandwaves. The wreck is orientated east to west with a large amount of scouring visible orientated north-west to south-east and measuring 70m in length. There is a very large magnetic anomaly measuring 9466nT associated, indicating the wreck has a ferrous composition. In the bathymetry data the wreck appears to cut through a megaripple. There is deck structure discernible in these data and possibly associated debris in the vicinity. The UKHO record (10849) associated with this wreck states it is unknown. It is described as lying in two parts with damage to the bow. The vessel was last observed in 2014 with dimensions of 31 x 10 x 5.1m and scour 1.5m deep and extending 60m.
- 5.2.88 Anomaly **70704 (Sheet 13)** is a medium sized wreck of a sailing vessel. In the sidescan sonar data the wreck appears to be relatively intact and upright though partially buried. Numerous short, straight slatted dark reflectors with height are visible in the data, that are likely deck structure and there are other reasonably distinct and detailed structural features visible. In the bathymetry data an indistinct mound is visible located within large sandwaves although it is difficult to distinguish as a wreck. The vessel appears to be aligned north-east to south-west and very little detail is visible. The wreck is mostly buried by sediments and the edge of the hull is hard to see. The wreck has dimensions of 26 x 7 x 2m and has a medium magnetic anomaly measuring 117nT associated indicating some ferrous content. In the UKHO record (10545) the wreck is described as a sailing vessel, intact and mainly covered by a sandwave. It was last observed in 2014 with dimensions of 46 x 8 x 2m.
- 5.2.89 Anomaly **70709 (Sheet 14)** is the wreckage of steamship *Montferland* (UKHO 10549). In the sidescan sonar data the wreck appears to be partially disintegrated and possibly broken up into sections, though still with height. The wreck has dimensions of 153 x 38 x 10.2m and the hull is clearly visible as a thick and distinct linear dark reflector. Numerous straight, sometimes slatted, sometimes square, dark reflectors can be distinguished across the deck, indicating some superstructure may still be standing. The wreck is visible in the bathymetry data as a distinct mound orientated north-west to south-east and lying perpendicular to large sandwaves. There is scour visible to the south-west of the wreck. The wreck appears upright with some possible associated debris located at the north-western end of the vessel. The wreck has a very large magnetic anomaly measuring 10244nT associated, suggesting a ferrous construction. In the UKHO database (10549) this is the steamship *Montferland*, built in 1921 in Newcastle-Upon-Tyne, with an original length of 128m. The vessel was attacked and wrecked by a German aircraft in 1941. It was carrying sugar, meat, steel, wool and milk powder at the time. The wreck was last observed in 2014 with dimensions of 160 x 34 x 7.7m and debris lying close to the north-east side of the vessel.
- 5.2.90 Anomaly **70744 (Sheet 15)** is a large wreck with dimensions of 68 x 11.3 x 6m. The wreck appears in the sidescan sonar data to be largely intact but with a possible break near one end. Numerous straight, dark reflectors and some slatted items are visible on the deck indicating surviving structure. The wreck is located in an area with large and frequent sandwaves and associated debris may be buried in the vicinity. The wreck has a very large magnetic anomaly measuring 10181nT associated, indicating a ferrous construction.

In the bathymetry data the wreck is visible as intact and lying upright on the edge of a large sandwave with sediment build up around the hull. The wreck is orientated north-east to south-west with scouring measuring 30m long and orientated to the south-east. The UKHO (10548) records this as an unknown wreck with dimensions of 31 x 10 x 4.1m lying straight but broken on the seabed. There is a scour up to 1.5m deep extending 65m from the wreck in both directions, north-west and south-east. The wreck has a large magnetic contact associated with it and was last observed in 2014.

- 5.2.91 Anomaly **70809 (Sheet 16)** is the wreck of the steam paddle schooner *Seagull* (UKHO 10550). The wreck appears to be partially disintegrated in the sidescan sonar data, but upright and mostly intact. Numerous straight dark reflectors with bright shadows that are likely surviving deck structure are visible. The wreck has a broad, irregular shadow displaying significant height above the seafloor. The wreck is orientated in a north-west to south-east direction and has dimensions of 47 x 18 x 7.6m. The width of the vessel suggests some of its structure and / or hull has collapsed. The vessel has a large magnetic anomaly measuring 1779nT associated, indicating a ferrous construction. In the bathymetry data the wreck appears intact and upright on a sandwave rich area of the seabed, again some superstructure is discernible in the data. The UKHO record (10550) states that the original dimensions of the schooner were 52.1 x 7m. It was built in 1848 in Belfast and sunk in 1868 after being struck by another vessel. The wreck is described as being very broken up and collapsed on the seabed. The vessel was last observed in 1994 by divers who recovered the ship's bell and identified its provenance. They recorded dimensions for the wreck of 40m in length with a height of 8.6m.
- 5.2.92 Anomaly **70834 (Sheet 17)** is the wreck of the steam screw barque *Xanthe* (10660 UKHO). In the sidescan sonar data the wreck appears to be relatively intact and upright, with a very distinct hull edge visible on both sides as a thick, curvilinear dark reflector. One end of the wreck appears to be more degraded than the other and partially buried. There are also some linear slatted deck features and possible structural elements discernible in the data, with associated items of debris visible close to the wreck. The wreck has dimensions of 66 x 12.8 x 6.4m and is orientated east to west on an area of the seabed covered with megaripples. The vessel has a medium magnetic anomaly measuring 147nT associated, indicating ferrous material is present, though the closest survey line is 18m away and the anomaly amplitude would be expected to be higher if a line crossed directly over the wreck. In the bathymetry data the wreck appears intact with possible superstructure visible and is distinct in between areas of megaripples. The vessel has scouring orientated to the south-east measuring over 100m in length and is lying in a water depth of 29m below Lowest Astronomical Tide (LAT). The UKHO (10660) records this as a 689 ton steamship, with original dimensions of 62.2 x 8.5 x 4.9m. The vessel was built in Hull in 1862 and was sunk after a collision in 1869 while carrying a cargo of coal. The wreck was last observed in 2002 with recorded dimensions of 55 x 10 x 7m.
- 5.2.93 Anomaly **70934 (Sheet 18)** is identified as recorded wreck *Sheaf Water* (10554 UKHO). In the sidescan sonar data a very large area of small, dark reflector objects with shadows is visible spread across the seabed, some of these are linear. The hull does not look intact and the vessel appears to be very broken up and degraded in the images. No structure or recognisable features are discernible and it is likely that much of the vessel has collapsed. The wreck has dimensions of 105 x 46.4 x 1.9m and is orientated north to south on a fairly flat and even area of the seabed. There is a large magnetic anomaly measuring 1056nT associated, indicating a ferrous composition. In the bathymetry data this wreck is visible as mostly buried and broken up and situated in a depression. The UKHO records this wreck as the *Sheaf Water*, a steamship torpedoed by a German E-Boat in 1942. The vessel's original dimensions are recorded as 97.5 x 13.1m. The length is comparable to

the dimensions from the geophysical data. The wreck is recorded as last observed in 1983.

- 5.2.94 Anomaly **70954 (Sheet 19)** is recorded in the UKHO database (10680) as an unknown wreck. In the sidescan sonar data this is a large wreck with dimensions of 73.2 x 29.6 x 5.1m. It appears to be mostly intact though possibly partially disintegrated. There are numerous dark reflectors, some of which are linear and have long, distinct shadows, which look to be surviving deck structure. The vessel has a large height measurement and is orientated north-east to south-west on a relatively flat and even area of the seabed. The vessel appears to have some sediment cover in places across the deck. There is a rope or chain feature (**70960**) situated 13m to the north-east of the wreck orientated north-west to south-east on the seabed. This may be associated debris or is perhaps more likely to be modern fishing gear, rope or chain that has caught on the wreck and been lost. In the bathymetry data the wreck appears upright and intact with a distinct area of scour orientated south-east with a depth of 1m below the seabed. A possible boiler can also be seen in the data. There is a large magnetic anomaly measuring 12104nT associated, indicating the wreck has a ferrous composition. The UKHO record (10680) associated with this wreck is for an unknown vessel last observed in 1983 with dimensions of 80 x 20 x 4m. The wreck is recorded as being intact.
- 5.2.95 Anomaly **70962 (Sheet 20)** is the recorded wreck *Fulgens* (UKHO 10556). In the sidescan sonar data this is visible as a very large, dispersed area of wreckage with dimensions of 107 x 43.5 x 4m. Hundreds of various sized dark reflector anomalies with shadows are visible in the data, some are linear shaped and likely deck structure features. Some parts of the outer hull edge appear to be intact, though some areas appear to have collapsed. The wreck has an associated debris field (**70958**) located on the eastern edge of the vessel which consists of a small patch of dispersed dark reflectors with height. It comprises approximately four anomalies, one thin linear dark reflector and smaller anomalies, the debris field dimensions are 44.4 x 19.2 x 0.2m. There are also four likely associated rope or chain features within the wreck's vicinity (**70952**, **70955**, **70956** and **70959**), the longest of which, **70952**, measures 98.2m in length and is orientated north-west to south-east. There is a large magnetic anomaly measuring 30656nT associated with this vessel indicating a ferrous construction. In the bathymetry data the wreck is orientated north to south and situated on a relatively flat and even area of the seabed. The hull appears to be broken up and more disintegrated at the southern (possibly stern) end of the vessel. In the UKHO database (10556) this is recorded as *Fulgens*, a steamship built in 1912 with original dimensions of 93.1 x 12.9 x 5.8m. It was sunk in 1915 by torpedo and is described as being very broken up with no scour and sonar dimensions of 100 x 30 x 3m.
- 5.2.96 Anomaly **71043 (Sheet 21)** is a large wreck broken into two sections, that appear to be in a poorly preserved condition, lying perpendicular to one another. The larger section is to the north and orientated east to west with dimensions of 52 x 17 x 0.5m. This section has straight edges along its length and the deck appears to be intact showing some superstructure. The boundaries of this section are not always discernible in the data and there is some slight scouring orientated north-west to south-east. The second section of the wreck has dimensions of 37 x 14 x 1.9m and is orientated north-east to south-west. This section of the wreck appears more degraded in the sidescan sonar data with little detail other than the hull edge discernible. The complete dimensions of the wreck site are 60 x 56 x 1.9m. This wreck has a large magnetic anomaly measuring 322nT associated, indicating a ferrous construction or cargo. In the bathymetry data this is visible as a large wreck split in two parts that appears to be very degraded and poorly preserved with little height above the seabed. Overall, the wreck appears to be poorly preserved and as it is located within large sandwaves there is potential for associated debris to be buried in the

vicinity. UKHO record 86378 is associated with this wreck. It records it as unknown and describes the wreck as being split into two pieces, one measuring 50m and the other 35m long.

- 5.2.97 Anomaly **71117 (Sheet 22)** is the recorded wreck of the HMS *Francolin*, UKHO number 10568. In the sidescan sonar data a large area of dispersed wreckage is visible on a fairly flat and even area of the seabed. The vessel appears to be very broken up with tens of linear dark reflectors with shadows discernible. The area the wreck covers measures 50.2 x 26.4 x 1.7m and it is orientated north-west to south-east. There is a very large magnetic anomaly associated measuring 13265nT, indicating a ferrous construction. In the bathymetry data the wreck is visible as an oval shaped uneven mound and appears very degraded with little height within a slight depression on a featureless area of the seabed. The UKHO record is situated 20m from the observed wreck location and states it to be the HMS *Francolin*, a trawler that was bombed and sunk by a German aircraft in 1941. It was last observed in 2015 with dimensions of 40 x 16 x 1.6m.
- 5.2.98 Anomaly **71128 (Sheet 23)** is an unknown wreck recorded in the UKHO database (82483). In the sidescan sonar data a small spread of several dark reflectors is visible. There are approximately 10 anomalies, some of which appear to be relatively straight, with height. The vessel has dimensions of 16.3 x 8 x 0.9m. It is extremely broken up and degraded and there is little indication in the sidescan sonar data images to suggest that this was once a wreck from its current condition on the seabed. The wreck is visible in the bathymetry data as an elongated mound orientated north to south on a relatively flat and even area of the seabed. Again, no structure or detail is visible in the data. The vessel has a very large magnetic anomaly measuring 954nT associated, indicating a ferrous construction or cargo. This wreck is recorded in the UKHO database as an unknown wreck, which was last observed in a 2015 survey with dimensions of 15 x 6 x 1m and orientated 050°.
- 5.2.99 Anomaly **71129 (Sheet 24)** are the remains of a medium sized wreck located within the inshore area of the provisional OCC. The wreck has dimensions of 30 x 16 x 2.6m; however, these should be considered a minimum as the vessel extends beyond the limits of the geophysical survey data. Sections of the hull of the vessel are discernible in the sidescan sonar data with some internal structure visible within this. The vessel comprises indistinct dark and bright reflectors, some linear and some irregular, across its extent. There are numerous slatted dark reflectors with shadows and associated debris scattered across the seafloor around the wreck. There is a large magnetic anomaly measuring 555nT associated, indicating a ferrous construction or cargo. There is also a magnetic anomaly (**71127**) of 64nT, discriminated as A2, located 84m south-west of the wreck that may be associated buried debris. In the bathymetry data the wreck extends beyond the data coverage, but a large mound is partially visible although there is little detail or structure discernible. A UKHO record (10560) for the HMS *Dungeness* is located 52m south of the location of this wreck and may be the same vessel. The vessel was a trawler that was bombed by a German aircraft in 1940 and ran aground. Nothing was observed at the position of this record in 1983 which might suggest that the position of the wreck is incorrect in the UKHO database.
- 5.2.100 Anomaly **71131 (Sheet 25)** is a recorded, but unknown wreck (UKHO 82484) visible in the sidescan sonar data as a large group of compact dark reflectors with a very distinct and broad shadow. The wreck has dimensions of 13 x 7 x 3m and is located in the inshore area of the provisional OCC. There are no distinguishable structural elements of the vessel visible which suggests that it is badly damaged or degraded, though it still stands tall above the seafloor although it appears to be partially buried by sediments. The wreck has a large magnetic anomaly measuring 368nT associated indicating ferrous material is

present. In the bathymetry data the wreck is visible as an upright distinct oval shaped mound orientated north-west to south-east in a featureless area of the seabed. Again, there is little detail visible though the highest point of the wreck is at the centre of the feature. The UKHO records this as an unknown wreck, last observed in 2015 with dimensions of 9 x 4.5 x 2.3m and orientated 130° on the seabed.

- 5.2.101 Wreck **71162 (Sheet 26)** is visible in the sidescan sonar data as a large area of indistinct wreck debris that appears to be very broken up. It covers an area of 54.5 x 18.2 x 2.6m on a sandwave rich part of the seabed. The feature comprises an elliptical area of dark and bright reflectors with some bright shadows. A thick curvilinear dark reflector can be seen and is likely one edge of the hull with some slatted dark reflectors and likely standing deck structure discernible within this. A large area of seabed is disturbed around the wreck suggesting that there may be further buried debris under the sediments. It is difficult to distinguish the full extents in the sidescan data as the wreck goes beyond the data limits. A large magnetic anomaly is associated with this wreck measuring 370nT and suggesting a ferrous construction or cargo. There is one piece of possible associated debris located 33m south-west of this wreck, **71158**. This is a small dark reflector object with dimensions of 1.5 x 0.5 x 0.2m located within a depression and an angular shadow. It has an associated magnetic anomaly measuring 146nT indicating it is ferrous debris. In the bathymetry data the wreck is visible as a broken up and poorly preserved wreck orientated north-west to south-east, with the southern section larger and more defined. The northern section of the wreck has some height whilst the centre is broken up and appears to be partially buried by sediments. There is a large amount of scouring orientated to the south-east and measuring over 100m in length. This vessel is associated with UKHO record 86203 of an unknown wreck, first observed in 2016 with a recorded sonar length of 30m.
- 5.2.102 Anomaly **71172 (Sheet 27)** is a very large area of dispersed wreck measuring 93.5 x 29 x 5.5m. In the sidescan sonar data there are numerous dark reflector objects of various sizes with bright shadows visible. Some of these appear to be quite straight and are possibly structural. A long and thin curvilinear dark reflector that may be part of the hull can also be seen, though the entire vessel is very broken up and indistinct. There are two possible associated pieces of debris in the vicinity of this wreck. **71163** is located 75m to the south-east and **71167** is located 62m to the south-east from the centre of the wreck. There is a large magnetic anomaly measuring 4056nT associated with this wreck indicating a ferrous construction. In the bathymetry data the wreck is visible as an upright and intact wreck orientated north-west to south-east. Two distinct possible structural elements can be seen in the centre of the wreck, possibly boilers, which are the highest point of the wreckage. The northern end of the vessel appears to be mostly buried or broken up. In the UKHO record (10571) this is an unknown wreck that was discovered in 1961 when it was fouled by a boats sweep. It was last observed in 2015 with dimensions of 86 x 14 x 3.8m.
- 5.2.103 Anomaly **71176 (Sheet 28)** is a medium sized wreck with no associated UKHO record. In the sidescan sonar data the wreck is visible as a distinct and irregular outline of parallel dark reflectors with some irregular bright shadows. These are likely to be structural remains, possibly parts of the deck. The wreck has dimensions of 19.8 x 8 x 1m and appears to be intact with the anomaly having a slatted texture. The wreck is orientated north-east to south-west on a rocky area of the seabed. There is no associated magnetic anomaly present at this location and it is likely that this is a non-ferrous wreck of wooden construction. In the bathymetry data this wreck is visible as a linear mound orientated north-east to south-west situated on a rough and uneven area of the seabed. A possible piece of associated debris (**71173**) is situated 24m to the south-east of the wreck. This is a long and relatively straight, narrow dark reflector with a broad, rounded shadow and has

dimensions of 3.9 x 0.5 x 0.5m. There is the potential for further buried debris to be present in the wreck's vicinity. This wreck is located 60m to the south-east of wreck **71181**.

- 5.2.104 Anomaly **71181 (Sheet 29)** is a very large and dispersed wreck spread over an area measuring 73 x 48.7 x 3.1m. The wreck is visible in the sidescan sonar data as a large number of mainly linear dark and bright reflectors. Possible slatted deck areas are discernible as well as very distinctive and clear structural debris in the data. The hull appears to be mostly intact, though large sections of structure may have collapsed over the sides of the vessel. The wreck is orientated north to south and is lying within large sandwaves. Several debris features lie close to the wreck (**71183**, **71174**, and **71175**) and there is a possibility that more debris may be buried by sediments in the vicinity of the wreck. In the bathymetry data **71181** appears as a partially buried wreck, lying upright and possibly broken up on an uneven area of the seabed with sandwaves situated to the south and east. There is significant scouring present orientated to the south-west and measuring approximately 60m in length. The wreck has a very large magnetic anomaly associated, measuring 25165nT, indicating a ferrous construction. UKHO record 58447 is associated with this wreck and describes it as an unknown vessel which was last observed in 2015 with dimensions of 77 x 16 x 2.5m.
- 5.2.105 Wreck **71188 (Sheet 30)** is recorded wreck *Ole Bull* (UKHO 10574). In the sidescan sonar data there is one particularly large, thick curvilinear object with height that may be part of the hull structure. Further linear and smaller dark reflector objects can also be distinguished in the data, though there is little detail visible and the full extent may be covered by sediment. The wreck has dimensions of 26 x 8 x 4.1m, which are significantly less than the original build dimensions of 82.3 x 11.6 x 5.5m, so it may be that the majority of the wreck has collapsed or is buried by sediments. The vessel has a very large magnetic anomaly associated measuring 1479nT, indicating a ferrous composition. In the bathymetry data the wreck is situated at a right angle to a large sandwave. It is orientated east to west and appears very distinct on the seabed. The UKHO records this wreck as the *Ole Bull*, a steamship built in 1901 that was sunk when it struck a mine laid by UC-19 in 1917. The vessel was last observed in 2015 with recorded dimensions of 22 x 4 x 4.5m. This wreck is located outside of the survey area but its recommended Archaeological Exclusion Zone brings it within.
- 5.2.106 In addition to the wrecks above there are a further 11 features discriminated as A1 within the provisional OCC: six pieces of debris, three debris fields and two very large magnetic anomalies (**Appendix VIII**).
- 5.2.107 Ferrous debris **70618 (Figure 13e)** is visible in the sidescan sonar data as a distinct dark reflector with a broad shadow. It has dimensions of 3.1 x 2.5 x 2m and has been identified on a rough and uneven area of the seafloor. The debris has a very large magnetic anomaly associated with it, measuring 1182nT and has been discriminated as A1 for this reason.
- 5.2.108 Ferrous debris **70784** has again been discriminated as A1 due to its very large associated magnetic anomaly, measuring 1113nT. In the sidescan sonar data this is discernible as a very small but distinct dark reflector with an irregular shadow and dimensions of 0.8 x 0.6 x 0.8m. The object is situated 6m south-east of debris field **70785 (Figure 13g)**, also discriminated as A1 due to its archaeological potential. In the sidescan sonar data **70785** is visible as a small patch of disturbed seabed comprising numerous dark reflectors with height. This ferrous debris field has dimensions of 10.8 x 2.4 x 1.3m. It shares the same magnetic anomaly as **70784** and the two features may well be related.

- 5.2.109 Anomaly **70460** is small piece of debris possibly associated with wreck **70459**, situated 27m to the south-west of the vessel (**Figure 13d**). The debris has dimensions of 1.6 x 0.2 x 0.2 and is visible as a thin curvilinear dark reflector with a shadow in the sidescan sonar data, located within sandwaves.
- 5.2.110 Anomaly **70832** and **70833** are both pieces of debris possibly associated with wreck **70834**. The former is a small and indistinct dark reflector with dimensions of 1.6 x 0.3 x 0.5m. This is located 5m from the eastern end of the vessel (**Figure 13g**). Debris **70833** is situated 2m from the eastern end of the vessel and slightly north-west of **70832**. The object has dimensions of 0.9 x 0.6 x 0.6m. This is discernible as a small dark reflector that is partially obscured by the wrecks shadow in the sidescan sonar data.
- 5.2.111 Debris **70640** is a long, thin and indistinct linear dark reflector with a long and broad shadow. The object has dimensions of 20.5 x 1.1 x 3.3m. This debris is possibly associated with wreck **70639**, as it is situated 9m to the north-west of the wreck's location (**Figure 13e**).
- 5.2.112 Debris field **70810** has dimensions of 8 x 3.3 x 0.4m. In the sidescan data this is discernible as a small patch of disturbed seafloor with some possible straight dark reflector features with height within. It is fairly indistinct. This debris field is located 7m from the north-western end of wreck **70809** (**Figure 13g**) and is possibly related debris.
- 5.2.113 Debris field **70958** is possibly associated with wreck **70962**, the wreck is orientated north to south and the debris field is situated on the eastern side of the hull (**Figure 13g**). In the sidescan data this is visible as a large area of dispersed dark reflectors with height. There are approximately four features consisting of a distinct, thin linear dark reflector and additional smaller, slightly rounded anomalies. The debris covers an area of 44.4 x 19.2 x 0.2m.
- 5.2.114 There are two magnetic anomalies with no associated surface expression discriminated as A1 within the provisional OCC. Magnetic anomaly **71073** (**Figure 13h**) is a very large dipole identified on more than one survey line measuring 949nT and **70615** (**Figure 13e**) is a large negative monopole only identified on one survey line measuring 1697nT. Both of these features have the potential to be substantial buried ferrous debris.
- 5.2.115 A total of 936 anomalies have been interpreted as A2 – uncertain origin of possible archaeological interest.
- 5.2.116 There are 73 pieces of debris discriminated as A2 recorded across the provisional OCC. Thirty-six of these have a magnetic anomaly associated, indicating they contain ferrous material (**Appendix VIII**). **71104** is a long, faint, linear dark reflector with a very slight shadow that is not particularly distinct in the sidescan sonar data. The feature has dimensions of 40.2 x 0.3 x 0.1m and it has a dark reflector with a narrow shadow visible at one end measuring 2.2 x 0.5 x 0.8m. This has been interpreted to be a possible length of rope or chain with an object such as an anchor attached. The feature has a large magnetic anomaly measuring 368nT associated indicating it is ferrous debris.
- 5.2.117 **70881** is a small, circular dark reflector with a bright reflector in the centre and a broad distinct shadow. The feature has dimensions of 2.5 x 1.9 x 0.5m and is associated with a large magnetic anomaly measuring 241nT indicating ferrous debris (**Figure 14**).
- 5.2.118 Ferrous debris **70474** is a distinct horseshoe shaped curvilinear dark reflector with no shadow, located within sandwaves. The feature looks slightly broken up or buried in parts and has dimensions of 5.7 x 0.6m. It has a medium magnetic anomaly measuring 126nT



associated. Debris feature **70380** is a large, curved dark reflector with a corresponding curvilinear shadow. It has dimensions of 8.8 x 1.6 x 0.1m and scouring associated, measuring 32.5m and orientated to the north-west.

- 5.2.119 Three pieces of debris identified in the 2012 former East Anglia Zone OFTO survey (**70317**, **70323** and **70320**) are situated within the provisional OCC. Debris **70320** was originally identified in the 2012 data as an indistinct, large curvilinear feature. It appeared to be partially buried and had scour and a distinct depression in the bathymetry data. In the 2016 bathymetry data this is visible as a large object within a depression, with a slightly rounded shape. The debris has dimensions of 6 x 4 x 0.3m and has scouring orientated to the north measuring 25m. The depression the object is situated in measures 8 x 6m.
- 5.2.120 There are 36 debris fields identified within the provisional OCC with an archaeological discrimination of A2 (**Appendix VIII**). Fifteen of these have magnetic anomalies associated indicating some ferrous content. The smallest debris field is **70344** which has dimensions of 5.4 x 0.8 x 0.2m and is located on the edge of a sandwave. This has been identified in the sidescan sonar data as three small and distinct dark reflectors with shadows. The largest feature in the debris field measures 1.9 x 0.7m.
- 5.2.121 The largest debris field identified is **71122**. This has dimensions of 83.4 x 19.1 x 0.3m. The debris field is comprised of several dispersed linear items of debris with height. This feature has a large magnetic anomaly measuring 362nT associated indicating ferrous debris is present. **70399** is a medium sized indistinct spread of possible debris. A thick curvilinear shaped dark reflector with a very large and bright shadow is discernible with some smaller exposed dark reflectors surrounding it. The debris field has dimensions of 9.5 x 8 x 2.5m and is situated within sandwaves, it may be partially buried. In the bathymetry data this is visible as a medium sized, distinct rounded mound situated in a depression. There is scouring 2m deep associated, this is orientated north and measures over 100m in length.
- 5.2.122 Seven seafloor disturbances have been identified within the provisional OCC (**Appendix VIII**). Anomaly **71001** is the largest area recorded with dimensions of 22 x 5 x 1.1m. In the sidescan data this is visible as an elongated area of disturbed seabed with irregular shadows or numerous objects with height close together in a line. In the bathymetry data this is visible as a linear arrangement of small mounds aligned east to west.
- 5.2.123 Seafloor disturbance **70318** was originally identified in the 2012 former East Anglia Zone OFTO survey as a weak, large diffuse irregular shaped anomaly with height in the sidescan sonar data. In the bathymetry data this was visible as a distinct depression with a mound to the south. The feature had dimensions of 9.2 x 4 x 0.7m. This seafloor disturbance was not observed in the most recent 2016 dataset and may have since been buried. This is situated approximately 25m north of a mound, **70319**, which is described below.
- 5.2.124 There are 29 bright reflector objects identified within the provisional OCC, all of which have been discriminated as A2 archaeological potential (**Appendix VIII**). The smallest feature (**71156**) has dimensions of 1.7 x 1.1m. This is a circular, bright reflector with a possible small dark reflector object in its centre. Bright reflector **70356** is a large feature with dimensions of 8.7 x 1.8m. It is visible in the sidescan data as a distinctive bright reflector that appears to be two semi circles aligned on the seabed, it looks highly anthropogenic. The largest bright reflector identified is **70385**, which has dimensions of 17.7 x 2.1m. This feature appears as a disjointed linear object, with a right-angled bend in its centre.

- 5.2.125 A total of 157 dark reflector features have been identified within the provisional OCC (**Appendix VIII**). The majority of these features, 101 of them, are less than 5m in length. Dark reflector **70937** is a typical example with dimensions of 4.7 x 0.5 x 0.3m. It is a short and straight distinct anomaly with a broad shadow (**Figure 15**).
- 5.2.126 Dark reflector **71121** is a large and irregular object with an irregular bright shadow. The feature has dimensions of 16 x 3 x 0.3m and is visible in the bathymetry data as a long and thin linear mound. It may be outcropping geology but this is not possible to determine from the data and it may be anthropogenic in nature. Dark reflector **70327** was originally identified in the 2012 former East Anglia Zone OFTO survey and falls within the provisional OCC. In the 2012 data this was identified as a weak, partially buried oval shaped dark reflector in the sidescan sonar data. It has not been observed in the most recent 2016 dataset and may have since been buried by sediments.
- 5.2.127 The smallest dark reflector identified is **71002** which has dimensions of 0.4 x 0.3 x 0.4m. It is a small but distinct, isolated dark reflector with a broad shadow. This has been identified on a flat and featureless area of the seabed. The largest dark reflector (**71042**) has dimensions of 19.2 x 0.3 x 0.3m. This is visible in the sidescan data as a long and thin slightly curvilinear dark reflector with height, it appears to be partially buried or broken up along its extent. This may be related to ferrous debris object (**71041**) situated 10m to the north-east.
- 5.2.128 A total of 36 possible rope or chain features have been identified across the provisional OCC. These vary in length from 7.2m (**70503**) to an extremely long 259m (**71264**). Ten possibly ferrous rope or chains have been recorded (**Appendix VIII**). Rope or chain **71264** has the largest magnetic anomaly associated measuring 591nT indicating a ferrous composition. The feature has dimensions of 259 x 0.8 x 0.4m. It is visible in the sidescan data as a long and thin curvilinear dark reflector with slight height. This is orientated north-west to south-east on the seabed and has a bright reflector (**71263**) situated 4m from it at its centre, which may be related.
- 5.2.129 Rope or chain **70913** is a long and thin curvilinear dark reflector with slight height and dimensions of 92.7 x 0.8 x 0.4m. The feature is possibly split apart or partially buried across its extent. It is orientated north-west to south-east on a relatively flat and even area of the seabed and has a large magnetic anomaly measuring 305nT associated indicating ferrous debris. Large ferrous linear anomaly **70823** is discernible in the sidescan sonar data as a long, thin and straight dark reflector with a shadow visible in parts. The feature has dimensions of 82.7 x 0.9 x 0.4m and an associated magnetic anomaly measuring 110nT. This may be a chain. It is located across an area of sandwaves and appears to be partially buried.
- 5.2.130 The shortest rope or chain identified is **70503**, which has dimensions of 7.2 x 0.5 and no measurable height. The feature is visible as a bright curvilinear feature lying in a 'C' shape on a rough and uneven area of the seabed. There is possible disturbance to surrounding sediment around the feature. Possible rope or chain **70989** has dimensions of 38.0 x 0.3 x 0.2m. It is a dark, linear feature with a slight shadow lying on a sandy seabed (**Figure 15**). There is no magnetic anomaly so it is unlikely to be ferrous in nature.
- 5.2.131 Ten mounds have been identified across the provisional OCC (**Appendix VIII**). One of these (**70319**) was originally identified in the 2012 former East Anglia Zone OFTO survey. This was described in the sidescan data as a weak, large diffuse irregular shaped anomaly with height that was possibly natural but larger in size than other natural features in the area. In the bathymetry data this was seen as a distinct mound on flat seafloor with two adjacent depressions separated by central barrier orientated north to south. A larger

depression was located to the west of the mound. In the 2016 bathymetry data this is visible as a small mound within natural features or possible scars and has dimensions of 9 x 7 x 0.6m.

- 5.2.132 Mound **70915** has a medium sized magnetic anomaly measuring 128nT associated indicating some ferrous debris may be present within the feature. It is a large mound with dimensions of 16 x 15 x 1.9m. In the sidescan data this is visible as a large, rounded and poorly defined dark reflector with a broad and long shadow. In the bathymetry data this is discernible as a large circular mound, very distinct on a featureless area of the seabed.
- 5.2.133 The largest mound identified within the provisional OCC is **71023**. This has dimensions of 36.7 x 22 x 3m. In the sidescan data this feature is discernible as a large mound with a distinct, broad shadow. The feature is comprised of tens of small dark reflectors with height. It is isolated and very distinct on a sandy and even area of the seabed. In the bathymetry data this is visible as a distinct and large circular mound, anomalous to the surrounding seabed.
- 5.2.134 There are 590 magnetic anomalies with no sidescan sonar feature associated across the provisional OCC. Two of these have been discriminated as A1, as discussed above, 588 have been given an archaeological discrimination of A2 (see **Appendix VIII**). These have been categorised as small magnetic anomalies of less than 50nT; medium sized magnetic anomalies of 50nT to 200nT, large magnetic anomalies of 201nT to 900nT and very large of over 900nT. Background magnetic variation caused by geology is approximately ± 5 nT and as such smaller anomalies recorded across the provisional OCC may prove to be geological in origin. Likewise, small anomalies may also be masked by this geological variation. All of the magnetic anomalies classified as A2 have the possibility to be buried objects with ferrous content that are of archaeological potential.
- 5.2.135 There are 275 small magnetic anomalies ranging from 6nT to 49nT, 245 medium sized magnetic anomalies ranging from 50nT to 200nT and 68 large anomalies ranging from 204nT to 841nT (**Appendix VIII**). These features, especially the large anomalies, have the potential to be substantial buried ferrous debris.

5.3 Maritime Archaeological Potential

- 5.3.1 The assessment of potential for the discovery of shipwreck and shipwreck-derived material within the study area draws on the results of the geophysical survey and desk-based research combined with further research of the wider area. Further information is presented in **Appendix IX**.

Navigational Hazards

- 5.3.2 A project entitled *Enhancing our Understanding: Mapping Navigational Hazards as areas of Maritime Archaeological Potential*, undertaken by Bournemouth University (Merritt *et al.*, 2007) assessed historical records of navigational hazards to interpret and characterise the marine historic environment. Areas assessed to be hazardous were considered alongside a model of the preservation potential of marine sediments with the purpose of identifying areas where there was not only a high potential for ship losses, but where there was also a high potential for the preservation of archaeological remains. These areas were coined as Areas of Maritime Archaeological Potential (AMAPs).
- 5.3.3 The provisional OCC truncates two AMAPs that are defined as having a high percentage of fine grained sediments and therefore a high potential of preservation (**Figure 16**).



- 5.3.4 The coastal section of the study area is within an area of medium potential for navigational hazard, with an exposed shallow coastal area, sheltered by offshore banks. Further offshore, the area is of low to medium potential for navigational hazard, with offshore banks, namely that of Happisburgh Sand which is located south of the provisional OCC, and exposure to all wind directions.
- 5.3.5 The study area falls within an area of significant shipping and navigation activity. These include the passage of merchant vessels, ferries, fishing vessels, recreational craft, military vessels, and vessels engaged on specialist operations such as aggregate dredgers.

Recorded Losses

- 5.3.6 As discussed in section 3.2, Recorded Losses are records for ships or aircraft that are known to have wrecked or crashed offshore, but for which the exact locations are not known. Recorded Losses are often grouped together by their general area of loss into Maritime Named Locations (displayed spatially as polygons or centrepoints of polygons, often associated with NRHE data), however many records (particularly from the NHER dataset) are given co-ordinates (displayed spatially as points), although these are similarly unsubstantiated.
- 5.3.7 Recorded Losses can be considered as an indication of the potential for archaeological maritime remains to exist within the study area and the type and number of wrecks that could be present. These records relate to vessels reportedly lost or for which no physical wreck remains have ever been identified. **Table 13** shows the distribution of these documented losses according to the date of loss for those records whose positions fall within the study area (in this case only the provisional OCC). Details regarding these losses are presented in **Appendix X**.

Table 13: Recorded Losses based on NRHE and UKHO data

| Period | Number of Losses |
|---------------|------------------|
| Medieval | 2 |
| Post-medieval | 14 |
| 19th century | 36 |
| Modern | 10 |
| Unknown | 5 |
| Total | 67 |

- 5.3.8 Recorded Losses are predominantly reported to have stranded in coastal areas, around Happisburgh and Bacton Beach. Other areas mentioned include Bromholme, Walcott, Eccles-on-Sea, Sea Palling, and Waxham, roughly covering 16km of coastline and although they are documented as being lost beyond the study area, their recorded loss position within the arbitrary Named Location places them within the study area. The majority of losses wrecked at or near Happisburgh, with Bacton beach being the second most popular location to have received wrecks. Both locations are Maritime Named Locations. A total of 22 vessels are recorded within the Bacton Beach Named Location, whilst 34 vessels are recorded within the Happisburgh Named Location.
- 5.3.9 In general, Recorded Losses paint a vibrant picture of the types of voyages being undertaken around the coast of Happisburgh. The losses across the area generally

represent 18th and 19th century vessels, including those involved in international trade. The sailing ships of the 19th century lost at Happisburgh predominantly feature cargo sailing vessel, crafts, schooners, brigs and ketches.

- 5.3.10 Further maritime Recorded Losses are recorded within the wider area, information for which is held by Wessex Archaeology and can be provided on request.

Overview of Potential

- 5.3.11 There is potential for the presence of archaeological material of maritime nature spanning from the Mesolithic period to the present day within the study area. The key areas of potential are summarised in **Table 14** below. The potential for further wrecks to be discovered within the study area is discussed in greater detail in **Appendix IX**.

Table 14: Summary of key areas of maritime potential

| Period | Summary |
|--------------|---|
| Pre-1508 AD | Low potential for material associated with prehistoric maritime activities. Prehistoric maritime activities include coastal travel, fishing and the exploitation of other marine and coastal resources. Vessels of this period include rafts, hide covered watercraft and log boats. |
| | Low potential for material associated with later prehistoric maritime activities, including seaworthy watercraft suitable for overseas voyages to facilitate trade and the exploitation of deep water resources. Such remains are likely to comprise larger boat types, including those representing new technologies such as the Bronze Age sewn plank boats which are associated with a growing scale of seafaring activities. |
| | Low potential for material of Romano-British date, associated with the expansion and diversification of trade with the Continent. Watercraft of this period, where present, may be representative of a distinct shipbuilding tradition known as 'Romano-Celtic' shipbuilding, often considered to represent a fusion of Roman and northern European methods. |
| | Low potential for material associated with coastal and seafaring activity in the 'Dark Ages', associated with the renewed expansion of trade routes and Germanic and Norse invasion and migration. Vessels of this period may be representative of new shipbuilding traditions such as the technique. |
| | Low potential for material associated with medieval maritime activity, including that associated with increasing trade between the UK and Europe, the development of established ports around the southern North Sea and the expansion of fishing fleets and the herring industry. Vessels of this period are representative of a shipbuilding industry which encompassed a wide range of vessel types (comprising both larger ships and vernacular boats). Such wrecks may also be representative of new technologies (e.g. the use of flush-laid strakes in construction), developments in propulsion, the development of reliable navigation techniques and the use of ordnance. |
| 1509 to 1815 | Medium potential for post-medieval shipwrecks representative of continuing technological advances in the construction, fitting and arming of ships, and in navigation, sailing and steering techniques. Vessels of this period continued to variously represent both the clinker techniques and construction utilising the flush-laid strakes technique. |
| | Medium potential for post-medieval shipwrecks associated with the expansion of transoceanic communications and the opening up of the New World. |



| Period | Summary |
|--------------|--|
| | Medium potential for post-medieval shipwrecks associated with the establishment of the Royal Navy during the Tudor period and the increasing scale of battles at sea. |
| | Medium potential for post-medieval shipwrecks associated with continuing local trade and marine exploitation including the transport of goods associated with the agricultural revolution. |
| 1816 to 1913 | Higher potential for the discovery of shipwrecks associated with the introduction of iron and later steel in shipbuilding techniques. Such vessels may also be representative of other fundamental changes associated with the industrial revolution, particularly with regards to propulsion and the emergence of steam propulsion and the increasing use of paddle and screw propelled vessels. |
| | Higher potential for the discovery of shipwrecks demonstrating a diverse array of vernacular boat types evolved for use in specific environments. |
| | Higher potential for wrecks associated with large scale worldwide trade, the fishing industry or coastal maritime activity including marine exploitation. |
| 1914 to 1945 | Higher potential for the discovery of shipwrecks associated with the two world wars including both naval vessels and merchant ships. Wrecks of this period may also be associated with the increased shipping responding to the demand to fulfil military requirements. A large number of vessels dating to this period were lost as a result of enemy action. |
| Post- 1946 | Potential for wrecks associated with a wide range of maritime activities, including military, commerce, fishing and leisure. Although ships and boats of this period are more numerous, losses decline due to increased safety coupled with the absence of any major hostilities. Vessels dating to this period are predominantly lost as a result of any number of isolated or interrelated factors including human error, adverse weather conditions, collision with other vessels or navigational hazards or mechanical faults. |

5.4 Aviation Archaeological Potential

- 5.4.1 The assessment of potential for the discovery of aircraft crash sites and aircraft derived material within the study area draws on the results of the geophysical survey and desk-based research combined with further research of the wider area. Further information is presented in **Appendix XI**.
- 5.4.2 There are no known aircraft crash sites recorded within the study area, however there is potential for the discovery of previously unknown aircraft material.

Recorded Losses

- 5.4.3 There are three Recorded Losses for aircraft casualties listed by the NRHE and NHER within the study area, although it is not confirmed if material relating to the crash sites has been discovered within the area, hence their inclusion as Recorded Losses.
- 5.4.4 The aircraft date to WWII and comprise two British bombers; a Wellington MK 1, and a Hampden Mk 1; and one German bomber. These aircraft are recorded as having been lost off the Happisburgh coast and their records signify the potential for hitherto unknown aircraft remains to exist on the seafloor within the study area. Remains relating to the German bomber were discovered by divers, however the position given has not been confirmed. Two geophysical anomalies are located close to the given position (**71080** and **71088**), however since they indicate isolated pieces of debris rather than coherent



remains or a debris field, as implied in the record for the aircraft, it is possible that either the position is wrong or the remains have been dispersed since their discovery in 1981.

- 5.4.5 Details regarding these aircraft are provided in **Appendix XII**. Records for other aircraft casualties are present within the wider area, information for which is held by Wessex Archaeology and can be provided on request.

Overview of Potential

- 5.4.6 There is potential for the presence of aviation material dating from the early 20th century until more recent times, with a concentration dating to the World Wars and in particular WWII. Discoveries may occur anywhere within the study area, but potential may increase nearer the coastlines.
- 5.4.7 The key areas of aviation potential that may be uncovered within the study area are summarised in **Table 15** and further discussion regarding the potential for discovering aviation remains is presented in Appendix XI.

Table 15: Summary of key areas of aviation potential

| Period | Summary |
|--------------|---|
| Pre- 1939 | Minimum potential for material associated with the early development of aircraft. Aircraft of this period may represent early construction techniques (e.g. those constructed of canvas covered wooden frames) or may be associated with the mass-production of fixed wing aircraft in large numbers during WWI. |
| | Minimum potential for material associated with the development of civil aviation during the 1920s and 1930s, associated with the expansion of civilian flight from the UK to a number of European and worldwide destinations. |
| 1939 to 1945 | Very high potential for WWII aviation remains, particularly as the east coast acted as a hub for hostile activity. Aircraft of this period are likely to be representative of technological innovations propelled by the necessities of war which extended the reliability and range of aircraft. This potential is signified by the three aircraft Recorded Losses outlined above. |
| Post- 1945 | Potential for aviation remains associated with military activities dominated by the Cold War, the evolution of commercial travel and recreational flying and the intensification of offshore industry (including helicopter remains). Aircraft of this period may be representative of advances in aerospace engineering and the development of the jet engine |

6 ARCHAEOLOGICAL ASSESSMENT OF INTERTIDAL HERITAGE ASSETS

6.1 Data Assessment

- 6.1.1 There is a total of 65 records relating to archaeological sites, artefacts, material and standing remains within the intertidal zone (to MHWS) of the provisional OCC at the landfall search zones of Bacton Green, Walcott Gap and Happisburgh South (**1001 to 1065**). These records have been derived from the NRHE and NHER archives and are illustrated in **Figure 17**.
- 6.1.2 More detailed information regarding these assets is presented in **Appendix XIII** and are discussed in context in the onshore assessment (Royal HaskoningDHV, forthcoming), but a summary is provided in **Table 16**: Recorded assets based on NRHE and NHER data and below:

Table 16: Recorded assets based on NRHE and NHER data

| Period | No. of Assets |
|-------------------------|---------------|
| Prehistoric | 11 |
| Palaeolithic | 17 |
| Neolithic | 5 |
| Bronze Age | 2 |
| Medieval | 8 |
| Post-medieval | 7 |
| Post-medieval to Modern | 4 |
| 19th Century | 1 |
| Modern (WWII) | 10 |
| Total | 65 |

- 6.1.3 A majority of the records refer to prehistoric findspots that no longer exist at the locations provided, and furthermore there appears to be a concentration of 24 records around Happisburgh. Some artefacts were discovered during the Norfolk Rapid Coastal Survey in Happisburgh, North Norfolk, whilst others were found by chance along Happisburgh beach. Features **1001** to **1008** consist of prehistoric flint flakes, scrapers and cores. Other finds relate to Palaeolithic flint artefacts including handaxes and flakes, often including environmental evidence (**1009** to **1016**, and **1018** to **1025**).
- 6.1.4 One record (**1017**) describes hominin footprints dating to early Pleistocene and early Middle Pleistocene located at Happisburgh after severe wave erosion exposed an area of laminated sediments on the foreshore. The footprints ranged from juvenile to adult hominin foot sizes and are considered the oldest known hominin footprints found outside Africa. Other significant early hominin sites have been located in Happisburgh comprising flint objects and cut-marked bones together with associated environmental remains.
- 6.1.5 Isolated Neolithic artefacts located in the intertidal area include polished flint axeheads (**1026** to **1028**) and a flaked flint axe (**1029**). These finds were discovered along Happisburgh Beach, Bacton and Walcott. Furthermore, discoveries dating to the Bronze Age include a blade fragment of a leaf shaped sword (**1034**) and a copper alloy flanged axehead found on Happisburgh beach (**1035**).
- 6.1.6 Records relating to **1030** to **1033** consist of multi-period finds ranging from the Neolithic to the post-medieval and include flint artefacts, coins, and pottery. These were all located within the area of Happisburgh.
- 6.1.7 Medieval findspots include an early Saxon silver pyramid mount with garnet (**1037**), a medieval gold ring dating to the late 12th or 13th century (**1038**), various coins (**1039**, **1041** to **1043**) and a harness pendant and coin of Charles I (**1040**). These finds were retrieved from Happisburgh, the area around Bacton and Walcott.
- 6.1.8 A Primitive Methodist chapel built in 1883 is wrongly recorded within the intertidal area (**1036**), as the record describes its position in Acle, a town located 20km to the south of Happisburgh.
- 6.1.9 Record **1044** refers to a medieval well to the south of Walcott. The site consisted of a square timber framed well, exposed by erosion in 1947. Its base was excavated in August 1948 and contained 13th century pottery. The finds are now located in Norwich Museum.



- 6.1.10 Record **1045** is the site of Happisburgh Low Lighthouse. This was one of two lighthouses erected in Happisburgh in 1791. By 1886 the lighthouse had fallen into the sea, probably as a result of coastal erosion. In 1980, when recorded by the Royal Commission on the Historical Monuments of England (RCHME), remains of part of the foundations still survived *in situ* but the majority of the remains lay on the beach or had been covered over by sand.
- 6.1.11 Post-medieval records include a coin showing George I (**1046**), and a flint and brick-lined well, now demolished (**1047**).
- 6.1.12 Modern records in the area refer to lines of posts visible on aerial photographs (**1048**, **1049** and **1053**) thought to be groynes or sea defences, the site of a brickyard that has since been eroded away (**1050**), an undated road from a map dating to 1797 that has since been destroyed by coastal erosion (**1051**), and a drain eroding from Happisburgh cliffs that was subsequently destroyed (**1052**).
- 6.1.13 Features **1054** and **1055** are both intertidal structures visible on aerial photographs taken in 1940. These possibly relate to WWII training or are evidence of coastal defences. It is possible that the remains may also relate to a wreck site that is no longer visible.
- 6.1.14 Military features are prevalent along this stretch of coastline. Within the study area several WWII features are recorded in the form of anti-tank blocks situated in the vicinity of Cart Gap to the north of Eccles-on-Sea and constructed between 1940 and 1941 (**1056**), and along Walcott Beach (**1057**). Two records relate specifically to WWII pillboxes - a polygonal pillbox (**1060**) situated in the vicinity of Cart Gap to the north of Eccles-on-Sea and now in poor condition, and the site of a former pillbox (**1061**) situated in the vicinity of Walcott Gap at Walcott that has been destroyed due to sea erosion and sea defence works.
- 6.1.15 Furthermore, **1062** describes barbed wire obstructions and possible weapons pits which are clearly visible on modern aerial photographs, **1063** is a site of barbed wire obstructions and two pillboxes, **1064** refers to coastal defences visible on aerial photographs, comprising of barbed wire obstructions, anti-tank cubes and a pillbox, and **1065** also includes anti-tank ditches, anti-tank cubes, barbed wire and pillboxes.
- 6.1.16 Record **1058** is for a Coast Artillery Battery situated on Happisburgh beach and about 38m north-east of Beach Road. The battery was built of concrete and was constructed between 1940 and 1941. The battery is equipped with mounting for two six-inch guns. The coastal battery was abandoned in the late 1940s as the Happisburgh Emergency Coast Battery became operational. At the time of a field visit on 30th October 1994 it was noted that the remains of the battery were in very bad condition and threatened by coastal erosion.
- 6.1.17 Record **1059** is for a machine gun post situated in the vicinity of Cart Gap to the north of Eccles-on-Sea. The gun post was built of brick and was constructed between 1940 and 1941. The polygonal structure was built into the cliff and is presumed to be a purpose-built machine gun post. At the time of a field visit between 1986 and 1988 it was noted that the structure was in fair condition.
- 6.1.18 The concentration of military defence features clearly indicates the vulnerability of this stretch of coastline during WWII.



6.2 Discussion and potential for heritage assets within the intertidal zone

- 6.2.1 As already discussed in section 4.3, there is the potential for prehistoric material, including palaeoenvironmental material such as peat and wood and also artefact evidence such as flint remains, to be discovered during the proposed work elements at the landfall sites.
- 6.2.2 The earliest direct evidence for Hominin activity in the UK was identified at the Lower Palaeolithic sites of Happisburgh, on the Norfolk coast, and Pakefield, on the Suffolk coast, dating from c. 800,000 and 700,000 BP respectively. These sites are both located within sediments of Cromerian age, and pre-date the earliest known glaciation of the UK. Due to the location of landfall in vicinity to these discoveries, the potential for uncovering material of equal international importance is considered to be high. Furthermore, the quantity of prehistoric material discovered from within the intertidal area indicates this area to be an area of high archaeological potential for such discoveries. The exposed footprints (**1017**) form one element of a group of internationally significant early hominin sites in Happisburgh investigated between 2005 and 2013 by the Ancient Human Occupation of Britain project (AHOB). These sites have pushed back the known record of human occupation of northern Europe by at least 350,000 years and continuing erosion of the coastline is likely to reveal further evidence of our distant past, transforming our understanding of the earliest human occupation of northern latitudes.
- 6.2.3 As sea levels rose, communities migrated further inland and as a result the types of archaeological assets discovered within the intertidal zone are of a maritime nature. Many of the recorded sites have been destroyed or are threatened by severe coastal erosion. This natural eroding factor can expose features of an archaeological nature, but can also bury existing features and therefore is very dynamic.
- 6.2.4 The concentration of military defence features present clearly indicates the vulnerability of this stretch of coastline during the WWII and the lengths taken to protect it. There may be potential for further material dating to WWII to be uncovered from intertidal contexts.

7 ASSESSMENT OF SETTING OF MARINE HERITAGE ASSETS

7.1 Introduction

- 7.1.1 The assessment of the setting of marine heritage assets within the study area draws on the results from the archaeological assessment of maritime and aviation sites (section 5 above). The heritage assets being referred to in this section consist of partially or fully buried features, and are located within a dynamic environment, reflecting past seascapes, palaeolandscapes, sea use, historic events and a general degree of change over time.
- 7.1.2 The assessment of setting for known marine heritage assets that appear to be isolated events without association with broader themes, together with assets that have limited information available has not been undertaken at this time. This also includes un-named wreck sites, unidentified foul ground/obstructions, or A2 geophysical anomalies. The setting associated with these assets cannot be experienced from land or within a wider marine landscape, and due to the generally limited visibility within UK waters, the experience of setting at their locations is likely to be limited to the immediate vicinity. With regards to wreck sites, vessels lost other than by design are not regarded as having a setting as their siting is based on chance alone.
- 7.1.3 Additional future discoveries made by the project during evaluation measures may provide further detail regarding the military setting containing these assets. However, ascertaining the true value of such relationships, between individual heritage assets and their wider



seabed context or setting, can only be inferred within this assessment until further information becomes available.

7.2 Norfolk Vanguard East

- 7.2.1 Within NV East there are five recorded wreck sites located across the area, three of which are associated with UKHO records and therefore have further information available (**70079**, **70255** and **70262**). Since these wrecks are all unidentified, their historic character and wrecking event is unknown and therefore their setting cannot be ascertained.
- 7.2.2 The remaining seabed features in NV East also contain limited information or are unidentified A2 geophysical anomalies, and as such it is impossible to infer their setting at this time.

7.3 Norfolk Vanguard West

- 7.3.1 Within NV West there are 12 recorded wrecks or obstructions, two of which are associated with UKHO records and therefore have further information available (**71334** and **71377**). Record **71377** is for an area of foul ground and therefore its setting will not be considered until further information is available.
- 7.3.2 The record for **71334** refers to an unidentified buried wreck containing substantial ferrous material. Since this wreck is unidentified, its historic character and wrecking event is unknown and therefore its setting cannot be ascertained at this time. However, it is considered to be associated with other A1 anomalies in close proximity, and if further survey/ground truthing is undertaken in the future this could provide more information regarding the overall setting of this wreck site.
- 7.3.3 The remaining seabed features in NV West are unidentified wreck sites, which contain limited information or are unidentified A2 geophysical anomalies, and as such it is impossible to infer their setting at this time.

7.4 Provisional Offshore Cable Corridor

- 7.4.1 Within the provisional OCC there are 37 recorded wrecks, 25 of which are associated with UKHO/NRHE records and therefore have further information available. Two of these records date to the 19th century (**70809** and **70834**), three relate to WWI losses (**70342**, **70962** and **71188**), and eight relate to WWII losses (**70360**, **70459**, **70617**, **70639**, **70709**, **70934**, **71117** and **71129**). The remaining 12 are unidentified wreck sites (**70565**, **70645**, **70659**, **70704**, **70744**, **70954**, **71043**, **71128**, **71131**, **71162**, **71172** and **71181**).
- 7.4.2 These 37 records are distributed across the provisional OCC but appear to be concentrated closer to the coastline. This may be due to the hazardous nature of the coastal topography, or possibly due to an increase in recordings by onshore witnesses of wrecking events. However, it could also be due to targeted military actions causing a proportion of vessels to wreck in this area.
- 7.4.3 Two records relate to 19th century wreck sites (**70809** and **70834**). Although these sites are located less than 1.5km apart, their records indicate they are isolated collision and wrecking events; *Seagull* (**70809**) was lost following a collision with the *Swan*, whilst the vessel *Xanthe* (**70834**) was lost following a collision with an unknown vessel in 1869. Since these vessels were lost other than by design, and their siting is based on chance alone, they are regarded as not having a setting beyond that experienced at their locations, and considering the generally limited visibility within UK waters this experience would be limited to the immediate vicinity.



- 7.4.4 With regards to maritime casualties during WWI and WWII, the recent study, *East Coast War Channels in the First and Second World War* (Firth, 2014), researched the spatial extent of navigation channels and minefields between the Thames and the Scottish border during both wars, and evaluated the heritage assets that are associated with these channels. The East Coast War Channels (ECWC) could be considered heritage assets with associated value in their own right, as they can be spatially represented. The significance of the value of their setting, specifically within the area of proposed development, may also become apparent through the assessment of the collective military landscape and seascape, encompassing recorded onshore defence infrastructure and known losses or documented losses of maritime vessels or aircraft during WWI and WWII.
- 7.4.5 Three records refer to WWI maritime casualties (**70342**, **70962** and **71188**), two of which are located in the inshore area. Although it is difficult at this time to infer more regarding their setting within the wider WWI military seascape of the ECWC, the histories of these vessels each indicate the location of a military strike and their cause of loss, the type of action undertaken by the German Imperial Navy and also the vessel responsible. This provides a broader understanding of how these incidents fitted into one element of WWI maritime activity - the targeting of civilian shipping and in particular merchant vessels. For instance, the wrecks of the two steamship colliers, *Fulgens* (**70962**) and *Ole Bull* (**71188**), were both lost less than 3km from the coast; caused by a torpedo attack and hitting a mine respectively. The submarines responsible for these actions were UB-10 and UC-19.
- 7.4.6 At present, these heritage assets are the only recorded elements of WWI military activity existing in the offshore study area, and although they are not intrinsically linked having been lost at different times, their setting is still considered part of the wider WWI military landscape and seascape present in the ECWC.
- 7.4.7 A total of eight of the known wrecks date to WWII, and although these are isolated military occurrences (similar to the WWI equivalents) the setting of each asset is apparent when considered within the wider collective WWII landscape and seascape of the region. These casualties were caused by Luftwaffe aircraft, torpedoes, and mines, and the vessels themselves were often merchant ships, part of the high concentration of essential civilian shipping present during this period.
- 7.4.8 The Norfolk Rapid Coastal Zone Archaeological Survey (Robertson *et al.*, 2005) and associated National Mapping Programme assessment (Albone *et al.*, 2007) clearly indicate the prevalence of WWII defence structures that were erected along the Norfolk coastline, remains of which are still present in the intertidal area (discussed in section 6). These features, along with the less visible, and therefore often less considered/experienced, offshore WWII sites (both known losses and documented losses of aircraft and vessels) all form part of the broader military landscape and must be jointly considered when evaluating the setting of individual and collective assets from this period. The extent of this military landscape/seascape will ideally become clearer as the Norfolk Vanguard development proposal becomes refined and evaluation works are undertaken utilising further survey and ground-truthing methods.
- 7.4.9 The remaining recorded sites with corresponding UKHO records are for unknown wreck sites. It is possible that these are associated with WWI or WWII military activity, and therefore become part of the broader military landscape that exists in the region, however without further information to identify these wrecks it is impossible to confirm at this time. If additional information is obtained from future evaluations, a more accurate assessment of the setting of these assets may be possible.



- 7.4.10 Due to the proximity of the study area with the supposed battle locations of the First, Second and Third Anglo-Dutch wars (1652 to 1654; 1665 to 1667; and 1672 to 1674 respectively), it is also possible that currently unidentified remains together with the discovery of new material within the area may relate to these events. A total of 20 Dutch ships and two English vessels were lost during the Battle of Lowestoft (1665) with three Dutch ships and four ships from the combined English and French fleet lost at the Battle of Sole Bay (1672); both of which are to the south of the study area. If evidence of these warships is confirmed in the study area, then their setting with regards to these events should be considered further as part of the EIA.
- 7.4.11 Finally, the remaining seabed features in the provisional OCC are unidentified A2 geophysical anomalies, and as such it is impossible to infer their setting at this time.

8 ASSESSMENT OF HISTORIC SEASCAPE CHARACTER

- 8.1.1 As part of the National Heritage Protection Plan (NHPP), English Heritage (now Historic England) commissioned a Historic Seascape Characterisation (HSC) for East Yorkshire to Norfolk, and the work was undertaken by the projects team of the School of History, Classics and Archaeology at Newcastle University (2014).
- 8.1.2 The East Yorkshire to Norfolk HSC project aimed to complete strategic-level HSC in accord with the national HSC Method that extends and applies the principles already in use for Historic Landscape Characterisation (HLC) to the coast and seas. The method assesses and defines areas with Historic Seascape Character types that promote an understanding of historic trends and processes in order to inform the sustainable management of change over time. This is achieved by addressing the multi-level character of the sea by splitting the marine zone into four tiered levels; the sea surface, the water column, the sea floor and the sub-sea floor. The characterisation is GIS-based, enabling key characteristics within the study area to be identified, and are summarised below.
- 8.1.3 The known and potential prehistoric, maritime and aviation heritage assets that form part of the HSC have been discussed in the relevant baseline characterisations above. The character descriptions below refer only to the cultural processes which have shaped the historic seascape of the study area.
- 8.1.4 The East Yorkshire to Norfolk HSC project identified several areas that are within or intersect with the study area, shown in **Table 17: HSC - primary cultural processes in the study area**.

Table 17: HSC - primary cultural processes in the study area

| Present Broad Character Types | Present Character Sub-Types |
|-------------------------------|---|
| Cultural Topography | Landward mobile cliffs |
| | Marine sand banks with sand waves |
| | Palaeolandscapes |
| Coastal Infrastructure | Flood and erosion defences |
| Communications | Submarine telecommunication cables |
| Fishing | Aquaculture – cultivated shellfish |
| | Inshore fisheries |
| | Offshore fishing grounds – trawling, netting, longline, potting |
| Industry | Energy industry – gas supply pipeline |



| Present Broad Character Types | Present Character Sub-Types |
|-------------------------------|--|
| | Extractive industry – marine aggregates dredging |
| Military | Military defence and fortification |
| Navigation | Maritime safety – lighthouse |
| | Navigation route |

9 VALUE AND SENSITIVITY

9.1 Value

9.1.1 The Marine Policy Statement (Department for Environment, Food and Rural Affairs, 2011) states ‘the more significant the [designated] asset, the greater should be the presumption in favour of its conservation’ (section 2.6.6.8 and 2.6.6.5). However, ‘many heritage assets are not currently designated as scheduled monuments or protected wreck sites but are demonstrably of equivalent significance. The absence of designation for such assets does not necessarily indicate lower significance and the marine plan authority should consider them subject to the same policy principles as designated heritage assets’ (East Inshore and East Offshore Marine Plans, 2014: no.148 p.52).

9.1.2 Based on information available to date, the marine archaeological baseline environment for the study area can be considered to comprise:

Norfolk Vanguard East:

- 18 palaeogeographic features of potential;
- Five recorded wrecks (A1 and A3); and
- 312 geophysical anomalies of anthropogenic potential (A2).

Norfolk Vanguard West:

- 110 palaeogeographic features of potential;
- 12 recorded wreck and obstructions (A1 and A3); and
- 172 geophysical anomalies of anthropogenic potential (A2).

Provisional Offshore Cable Corridor:

- 43 palaeogeographic features of potential;
- 37 recorded wrecks (A1);
- 936 geophysical anomalies of anthropogenic potential (A2);
- Known maritime assets with setting when considered within the WWI and WWII military landscape; and
- 65 records within the intertidal area; remains of 21 of these may still be present in the area (i.e. not findspots or erroneous positions).

Study Area:

- Potential for discovery of prehistoric sites and artefacts from the Palaeolithic to the Mesolithic;
- Potential for the discovery of shipwreck material from the late Mesolithic to the present;
- Potential for the discovery of 20th century aircraft material, particularly from World War II;



- Potential for the discovery of remains within the intertidal area from the Palaeolithic to the modern periods (especially WWII related infrastructure);
- The HSC of the area that comprises a broad range of cultural processes including fishing, military, industry, communications, navigation and coastal infrastructure.

9.1.3 This section identifies the value and sensitivity of the known marine heritage assets and their setting (if applicable), the potential for unknown marine heritage assets, and the historic seascape character, as summarised in the baseline assessments above (sections 4 to 9).

9.1.4 The nature of the marine archaeological resource is such that there is often a high level of uncertainty regarding the presence/absence, distribution, extent and nature of archaeological assets on the seafloor. As a precautionary measure, unknown potential cultural heritage assets are therefore considered to be of **high** sensitivity and **high** value, until more information is available.

Seabed Prehistory

9.1.5 There are no records of any known prehistoric sites from offshore contexts within the study area. A total of 171 palaeogeographic features were identified in the SBP data and geotechnical samples assessed for the study area that may contain archaeological remains. There is also significant potential for the presence of as yet undiscovered *in situ* prehistoric sites and finds, and a high potential for isolated derived finds in a secondary context. The values assigned to these potential heritage assets are outlined in **Table 18**.

Table 18: Value of seabed prehistory heritage assets

| Asset Type | Definition | Value |
|--|--|--------|
| Potential <i>in situ</i> prehistoric sites | Primary context features and associated artefacts and their physical setting (if found) | High |
| | Known submerged prehistoric sites and landscape features with the demonstrable potential to include artefactual material | High |
| Potential submerged landscape features | Other known submerged palaeolandscape features and deposits likely to date to periods of prehistoric archaeological interest with the potential to contain <i>in situ</i> material | High |
| Potential derived Prehistoric finds | Isolated discoveries of prehistoric archaeological material discovered within secondary contexts | Medium |
| Potential palaeoenvironmental evidence | Isolated examples of palaeoenvironmental material | Low |
| | Palaeoenvironmental material associated with specific palaeolandscape features or archaeological material | High |

9.1.6 On the basis of their age and rarity in a marine context, all *in situ* Palaeolithic and Mesolithic material will be of high archaeological value. The guidance for planning authorities and developers on *Identifying and Protecting Palaeolithic Remains* (English Heritage (now Historic England), 1998) notes that sites containing certain forms of Palaeolithic material are so rare in Britain that they should, whenever possible, remain undisturbed.

9.1.7 In the event that prehistoric archaeological material discovered offshore is found *in situ* it should be considered of particularly high archaeological importance. As such, the features and deposits which have the potential to contain within them *in situ* material should be considered as **high** value assets.



- 9.1.8 Prehistoric archaeological material discovered within secondary contexts also has the potential to provide valuable information on patterns of human land use and demography in a field of study which is still little understood and rapidly evolving (Hosfield and Chambers, 2004). They are, however, by their very nature derived and, as such, isolated prehistoric finds should be regarded as **medium** value assets.
- 9.1.9 Palaeoenvironmental evidence in the context of an *in situ* prehistoric site (if found) will be of **high** value. However, as there are no known prehistoric sites within the study area, isolated discoveries of palaeoenvironmental material should be considered of low value for the purpose of this assessment.
- 9.1.10 More widely, palaeolandsurfaces and palaeolandscape features will be considered of **high** value for the purpose of this assessment owing to the Quaternary scientific potential of such sedimentary sequences, to contextualise the wider early prehistoric palaeogeography and the potential of palaeolandscape features to preserve *in situ* artefacts and sites (Bicket and Tizzard, 2015).

Seabed Features: Maritime

- 9.1.11 The perceived value assigned to an individual wreck site is, to a large degree, site specific. A vessel may be considered of special interest on the basis of any number of interrelating integral and relative factors, as discussed in section 3.7. Those regarded as being of special interest may further be designated under the Protection of Wrecks Act 1973 or the Protection of Military Remains Act 1986. Only features located within the study area are discussed in this section.
- 9.1.12 There are no wrecks with statutory designations located within the study area.
- 9.1.13 There are 54 known and charted sites or obstructions, and the potential for further wrecks or maritime-related debris to exist within the study area. The values assigned to these heritage assets are outlined in **Table 19**: Value of maritime heritage assets .



Table 19: Value of maritime heritage assets

| Asset Type | Definition | | Value |
|----------------------------------|--|--|--------|
| Known assets | Named wrecks (A1) | <i>Golden Oriole</i> (possibly) (70342); HMS <i>Dunoon</i> (possibly) (70360); <i>Phillipp M</i> (70459); <i>Rye</i> (70617); <i>Trevethoe</i> (70639); <i>Montferland</i> (70709); <i>Seagull</i> (70809); <i>Xanthe</i> (70834); <i>Sheaf Water</i> (70934); <i>Fulgens</i> (70962); HMS <i>Francolin</i> (71117); HMS <i>Dungeness</i> (71129); <i>Ole Bull</i> (71188) | High |
| | Un-named wrecks (A1) | 70021; 70255; 70262; 71334; 70565; 70645; 70659; 70704; 70744; 70954; 71043; 71128; 71131; 71162; 71172; 71176; 71181 | High |
| | Magnetic anomalies (A1) | 70058; 70615; 71073; 71297; 71299; 71314; 71323; 71325; 71479 | High |
| | Debris fields (A1) | 70460; 70618; 70640; 70784; 70785; 70810; 70832; 70833; 70958; 71301; 71332; 71333; 71336 | High |
| Additional anomalies | Anomalies identified by geophysical assessment that could be of anthropogenic origin totalling 1,421 (A2), with 313 in NV East, 172 in NV West and 936 in provisional OCC. | | High |
| Potential wrecks | Wrecks within the study area that are yet to be discovered. | | High |
| Potential derived maritime finds | Isolated artefacts lost from a boat or ship or moved from a wreck site. | | Medium |

- 9.1.14 Eight of the 13 known wrecks comprise WWII losses, either torpedoed, bombed or struck by mines. Three comprise WWI losses, two of which were struck by mines and one torpedoed. Two comprise vessels that sank as a result of collision dating to the 1860s. A majority of the WWI and WWII wrecks consist of dispersed wreck debris. However, some are broken in two with hulls clearly still intact. These examples are considered to be of **high** archaeological value due to the importance of their military involvement during the wars.
- 9.1.15 For all unknown wrecks, there is insufficient data to assess the value of each individual wreck. As such, all wreck sites must be considered to have archaeological value, to a greater or lesser degree and, in accordance with the precautionary approach, must be considered as high value assets. Similarly, as the value of potential wrecks cannot be evaluated until they are discovered, potential wrecks of all periods should be expected to be of **high** value.
- 9.1.16 Twenty-five reported assets have been recorded as magnetic or areas of debris or debris fields under A1 discrimination. These are considered to be of **high** archaeological value until more information becomes available. A majority of these assets are located within the provisional OCC.
- 9.1.17 As there is insufficient information to assess the value of each individual unidentified anomaly identified in the geophysical assessment (A2), all of these additional anomalies must be considered to have **high** archaeological value until more information becomes available.
- 9.1.18 Derived artefacts are likely to be of limited archaeological value as individual discoveries. However, the occurrence of a number of seemingly isolated objects within a particular area has the potential to indicate shipping routes or maritime battlegrounds, or possibly even indicate the presence of a hitherto unknown wreck site. Isolated maritime finds are, therefore, regarded as being of **medium** archaeological value.

Seabed Features: Aviation

- 9.1.19 There are no known aircraft crash sites in the study area, however it is possible that any of the 1,474 geophysical anomalies of uncertain origin of possible archaeological interest located within the study area could relate to aircraft material. Therefore, there is the potential for aircraft or aircraft-related debris to exist on the seafloor of the study area and it is still possible to comment on the value of such discoveries.
- 9.1.20 The values assigned to these heritage assets are outlined in **Table 20: Value of aviation heritage assets** and refer to aviation remains located across the entire study area.

Table 20: Value of aviation heritage assets

| Asset Type | Definition | Value |
|----------------------------------|--|--------|
| Additional anomalies | Anomalies identified by geophysical assessment that could be of anthropogenic origin totalling 1,421 (A2). | High |
| Potential aircraft | Aircraft within the study area that are yet to be discovered. | High |
| Potential derived aviation finds | Isolated artefacts lost from an aircraft or moved from a crash site. | Medium |

- 9.1.21 Aircraft lost at sea prior to 1939 would be considered of value due to their relative rarity, and the lightweight construction of earlier airframes means that they are less likely to survive in the marine environment unless buried within seabed sediments.
- 9.1.22 Aircraft lost as a result of military action during WWII would have value associated with that international event, however, the level of conservation of material on the seabed, the rarity of the aircraft type, the potential for the discovery of human remains associated with the aircraft, and a number of other factors, for example those outlined in the BULSI guidance, would need to be considered to confirm its value.
- 9.1.23 Any aircraft lost after WWII will likely have been reported and recorded, and are more likely to represent types that are still known today. Therefore, a special case would likely need to be made for any recent material.
- 9.1.24 Aircraft are considered to have significance for remembrance and commemoration, but also have an implicit heritage value as historic artefacts, providing information on the aircraft itself and also the circumstances of its use and loss (Historic England (now English Heritage), 2002: 2). On this basis, all potential aircraft sites are considered to be of **high** value.
- 9.1.25 It is also conceivable that any of the unidentified geophysical anomalies could be identified as aircraft crash sites, and subsequently are presently considered of **high** archaeological value.
- 9.1.26 Isolated aircraft finds are considered as being of **medium** archaeological value as they may provide insight into patterns of historical aviation across the study area or indicate the presence of uncharted aircraft crash sites.

Intertidal Heritage Assets

- 9.1.27 There are a total of 65 assets located within the intertidal area of the study area. The values assigned to these heritage assets are outlined in **Table 21** and refer to intertidal remains located within the landfall area.



Table 21: Value of intertidal heritage assets

| Asset Type | Definition | | Value |
|------------------------------------|--|---|--------------|
| Known assets | Findspots | Findspots consisting of single or multiple finds located within the intertidal zone. | Negligible |
| | Structures | Structures of a vernacular nature including: sea defences; wells; brickyard; lighthouse; road; and drain | Low |
| | Military Structures | Structures related to military activities including: military defences; pillboxes; machine gun posts; artillery batteries; anti-tank blocks | Low |
| Potential derived intertidal finds | Isolated artefacts and findspots dating to all periods which are located within the intertidal zone. | | Medium |

- 9.1.28 A total of 35 findspots have been recorded, **1001** to **1035**, dating from the Palaeolithic to the Bronze Age. These artefacts have been removed from the area and therefore will not be affected by the development, and as such, these records have no archaeological value, with the exception of **1017**.
- 9.1.29 Record **1017** consists of hominin footprints dating to Early Pleistocene and early Middle Pleistocene. Sites such as this have pushed back the known record of human occupation of northern Europe by at least 350,000 years and continuing erosion of the coastline is likely to reveal further evidence of our distant past, transforming our understanding of the earliest human occupation of northern latitudes. Therefore, although these particular footprints do not exist anymore and therefore do not have corresponding archaeological value, there is still potential for further similar remains to be uncovered and these would be considered to be **high**.
- 9.1.30 Seven findspots (**1037** to **1044**) have been recorded dating to the medieval period, consisting of coins and artefacts, along with a medieval well that was excavated in 1948. All these finds have been taken from site, therefore they will not be affected by the development, and have no archaeological value.
- 9.1.31 Although no remains of the post-medieval lighthouse (**1045**) are visible on modern aerial imagery, elements of its foundations might still be *in situ* and therefore could be impacted upon. Due to the nature and date of this structure, the corresponding archaeological value is considered to be **low**.
- 9.1.32 Another ten records (**1046** to **1055**) have been dated to the post-medieval period consisting of a findspot, structures, sea defences and other features. Most have been destroyed by coastal erosion and therefore no longer exist. Due to the nature and date of these structures, and that potential still exists for associated remains to be uncovered, the corresponding archaeological values is considered to be **low**.
- 9.1.33 The 19th century Primitive Methodist chapel (**1036**) is located within the town of Acle, unlike the co-ordinates provided by the NRHE that erroneously locate it within the intertidal area. As a result, the chapel has no archaeological value with regards to the project.
- 9.1.34 Ten assets date to WWII (**1056** to **1065**) and consist of two anti-tank blocks, an artillery battery, a machine gun post, two pillboxes and four military defences. These assets have either been removed after the war, destroyed due to sea erosion or at the time of



inspection were already in a bad condition. Due to the nature and date of these structures, the corresponding archaeological value is considered to be **low**.

Setting of Heritage Assets

- 9.1.35 Section 7 above mainly focussed on the possible setting of WWI and WWII heritage assets. Collectively they may represent important features within a wider military seascape that may or may not be directly related. And as such the value of their setting can be considered **high**, in accordance with the precautionary approach.
- 9.1.36 Alongside the known A1 wrecks mentioned in section 7.4, further evaluation works undertaken as part of the project may also identify further unknown wreck sites, ordnance or even mine sinkers, all of which will add to the value of the military setting of these heritage assets.
- 9.1.37 Although the use of micro-siting and Archaeological Exclusion Zones will be used as a form of mitigation to protect assets and their setting, other cases whereby remains are impacted through relocation, recovery or damage may have a detrimental effect on their setting when considered within the wider collective landscape. Seascapes/landscapes may be able to sustain the removal or disassociation through project activity of a limited number of relevant heritage assets, but its wider value may be diminished.

Historic Seascape Character

- 9.1.38 The local seascape characters located around and within the study area are considered to be of **medium** archaeological value due to the area's important and prolonged maritime history and its continued use today.
- 9.1.39 The HSC of the study area will remain predominantly the same whilst the project is in operation, with the inclusion of a new element into this character; offshore wind farm and associated offshore HVDC or HVAC cables. Once the project is decommissioned, this character will no longer be part of the seascape of the area.

9.2 Sensitivity of Heritage Assets and Seascape Character

- 9.2.1 The archaeological resource is finite and non-renewable, and represents a unique aspect of cultural heritage (UK Marine Policy Statement, 2011: 21). All archaeological receptors have the potential to be damaged or destroyed if they are exposed to direct, indirect or secondary impacts during construction, operation or decommissioning activities. As such, all archaeological sites and material should be regarded as vulnerable. In addition, archaeological features have no adaptability, tolerance or recoverability, and subsequently any direct damage will be permanent and irreversible.
- 9.2.2 With regards to the sensitivity of the setting of heritage assets and seascape character in terms of its setting, the impacts are temporary to the lifetime of the project, and the effects are entirely non-physical. Therefore, any change to the setting of assets is entirely reversible with the decommissioning of the project and the recovery would be instantaneous.

10 ENVIRONMENTAL APPRAISAL AND RECOMMENDATIONS

10.1 High Level Environmental Appraisal

- 10.1.1 This section presents a high level appraisal used to determine the significance of the effects of the preparation, installation, operation, maintenance and decommissioning elements of the project, and refers to guidance developed for the Offshore Renewable



Energy sector (COWRIE 2007, 2008, 2011). The assessment has also been based on professional archaeological judgement and best practice that has been applied to other consented marine development projects.

10.1.2 Offshore developments can affect heritage assets in two ways:

- *from the direct effect of the physical siting of the project; and*
- *from indirect changes to the physical marine environment.*

10.1.3 Impacts to heritage assets and their historic environment occur as a result of changes to their physical environment in terms of loss and / or degradation, which can subsequently reduce the significance of a heritage asset and its wider historic environment. The management and mitigation of such change is based on the principle that archaeological assets are finite, non-renewable and cannot adapt, tolerate or recover from direct impacts.

10.1.4 Heritage assets may be buried within seabed sediments or may rest upon the seafloor, either with or without height. As such, direct impacts to such assets can occur during any development or related activity that makes contact with the seafloor or cuts through seabed deposits. Heritage assets with height, such as wrecks, may also be impacted by development or activities that occur within the water column.

10.1.5 The implementation of the marine element of the project is anticipated to entail the following sources of ground disturbance:

- *Seabed preparation prior to foundation installation and cable laying;*
- *Survey and clearance of unexploded ordnance (UXO);*
- *Installation of turbine foundations (options include jacket, gravity base, suction caisson, monopile and floating foundations);*
- *Placing of scour protection around turbine locations;*
- *Installation of substations, accommodation platform and converter stations;*
- *Laying of inter-array, inter-connector and export cables (methods include ploughing, jet trenching, dredging, mass flow excavation and / or mechanical trenching);*
- *Backfilling of cable trenches and protection/stabilisation of surface laid marine cables (options include rock placement, concrete/frond mattresses, or uraduct);*
- *Scour associated with the disturbances listed above; and*
- *Seabed contact by legs of jack-up vessels and / or anchors on vessels associated with the installation, maintenance and decommissioning phases of the project.*

10.1.6 The activities listed above may result in impacts that have potential direct and / or indirect effects on marine archaeological heritage assets. The activities and anticipated effects are summarised in **Table 22**.

Table 22: Impact types and potential effects on marine archaeological heritage assets

| Activity | Anticipated effects on archaeological asset | Impact type |
|--------------------|---|-------------|
| Seabed preparation | Direct damage/destruction to assets lying on the seafloor and buried within the shallower seabed sediments. | Direct |



| Activity | Anticipated effects on archaeological asset | Impact type |
|---|---|-------------|
| UXO survey and clearance | Direct damage to assets located within close proximity to UXO | Direct |
| Installation of turbine foundations and placing of scour protection | Direct damage/destruction to assets lying on the seafloor and buried within the shallower seabed sediments. | Direct |
| Installation of ancillary infrastructure | Direct damage/destruction to assets lying on the seafloor and buried within the shallower seabed sediments. | Direct |
| Cable burial whereby seabed is truncated | Direct damage/destruction to assets, and / or their physical setting, lying on the seafloor and buried within the seabed sediments. | Direct |
| Cable laying on the seabed | Direct damage/destruction to assets lying on the seafloor. | Direct |
| Installation of cable protection (where burial is not possible) | Direct damage/destruction to assets, and / or their physical setting, lying on the seafloor and buried within the seabed sediments. | Direct |
| | Potential scour and plume effects resulting in increased protection to, or deterioration of, assets in the vicinity. | Indirect |
| Seabed contact by legs of jack-up vessels and / or anchors on vessels during installation, scheduled and unplanned maintenance works and decommissioning works. | Localised damage/destruction to assets, and / or their physical setting, lying on the seafloor and buried within the seabed sediments. | Direct |
| Changes to the hydrodynamic and sedimentary regimes due to spoil removal and distribution caused by installation of foundations and trenching operations. | Increased protection to, or deterioration of, assets resulting in a beneficial or adverse effect on assets in the vicinity. | Indirect |
| Changes to hydrodynamic and sedimentary regimes resulting from the removal of turbines and cables and associated scour protection as part of decommissioning works. | Increased protection to, or deterioration of, assets resulting in a beneficial or adverse effect on marine archaeological assets in the vicinity. | Indirect |

10.2 Recommendations

- 10.2.1 There is the potential for the proposed project to impact as yet unknown heritage assets, including sites relating to seabed prehistory, wreck sites and aircraft remains situated within the study area.
- 10.2.2 Mitigation is necessary to reduce, remove or offset the impacts on heritage assets and fall under three main categories: avoidance; reduction of impact; and remedying and offsetting. Prior to the project starting, any further planned archaeological work should be detailed within a Written Scheme of Investigation (WSI). Any changes to the project design may require additional assessment of geophysical data in the future.

Avoidance

- 10.2.3 Avoidance is considered to represent the primary option with regards to mitigating impacts upon the marine archaeological resource. This is typically achieved through the implementation of Archaeological Exclusion Zones (AEZs), around known sites prohibiting any development activities to take place within its remit, or through the micro-siting of the project design to avoid vulnerable heritage assets.



- 10.2.4 A total of 318 anomalies have been identified as being of possible archaeological interest within NV East. Four of these have been assigned an A1 archaeological potential rating, 313 features have been assigned an A2 rating and one A3 historic record of possible archaeological interest with no corresponding geophysical anomaly has been identified.
- 10.2.5 In NV West 184 anomalies have been identified in total. Of these, 11 have been assigned an A1 archaeological potential rating, 172 features have been assigned an A2 rating and one A3 historic record of possible archaeological interest with no corresponding geophysical anomaly has been identified.
- 10.2.6 In total 973 anomalies have been identified as being of possible archaeological interest within the provisional OCC. Thirty-seven of these have been assigned an A1 rating and 936 features have been assigned an A2 rating. No A3 records were present in this area.
- 10.2.7 It is recommended that AEZs are implemented around all 30 wrecks and two debris fields with large magnetic anomalies (A1s) within the study area following the assessment of geophysical survey data (**Table 23**). In addition, an AEZ should be implemented around wreck **74180**, even though it lies outside the study area, as the AEZ encroaches on the NV East area (**Figure 11**). All AEZs are recommended to be 50m buffers around the extents of the wreck or debris field, as recorded in the sidescan sonar and bathymetry data. These are illustrated in **Figures 11, 12, 13a, 13b and 13d-h**.



Table 23: Archaeological Exclusion Zones recommended in this assessment

| WA ID | Type | Position | | Status Exclusion Zone | | Area |
|-------|--------------|----------|----------|-----------------------|--------------------|--------------------|
| | | Easting | Northing | | | |
| 70021 | Wreck | 496438 | 5859769 | New | 50m around extents | NV East |
| 70255 | Wreck | 496393 | 5847836 | New | 50m around extents | |
| 70262 | Wreck | 498353 | 5847680 | New | 50m around extents | |
| 71480 | Wreck | 503572 | 5848770 | New | 50m around extents | |
| 71301 | Debris field | 470711 | 5873567 | New | 50m around extents | NV West |
| 71334 | Wreck | 470730 | 5870846 | New | 50m around extents | |
| 70342 | Wreck | 477521 | 5849048 | New | 50m around extents | Provisional OCC |
| 70360 | Wreck | 466386 | 5846784 | New | 50m around extents | |
| 70459 | Wreck | 446041 | 5844450 | New | 50m around extents | |
| 70565 | Wreck | 431217 | 5841986 | New | 50m around extents | |
| 70617 | Wreck | 429617 | 5846348 | New | 50m around extents | |
| 70639 | Wreck | 428802 | 5847632 | New | 50m around extents | |
| 70645 | Wreck | 428283 | 5848091 | New | 50m around extents | |
| 70659 | Wreck | 426967 | 5850445 | New | 50m around extents | |
| 70704 | Wreck | 422267 | 5849082 | New | 50m around extents | |
| 70709 | Wreck | 421671 | 5849182 | New | 50m around extents | |
| 70744 | Wreck | 419288 | 5849507 | New | 50m around extents | |
| 70785 | Debris field | 415354 | 5849572 | New | 50m around extents | |
| 70809 | Wreck | 413550 | 5850143 | New | 50m around extents | |
| 70834 | Wreck | 412105 | 5850354 | New | 50m around extents | |
| 70934 | Wreck | 406929 | 5852021 | New | 50m around extents | |
| 70954 | Wreck | 406125 | 5853694 | New | 50m around extents | |
| 70962 | Wreck | 406058 | 5852977 | New | 50m around extents | |
| 71043 | Wreck | 403723 | 5852349 | New | 50m around extents | |
| 71117 | Wreck | 402077 | 5855893 | New | 50m around extents | |
| 71128 | Wreck | 401921 | 5856180 | New | 50m around extents | |
| 71129 | Wreck | 401875 | 5853654 | New | 50m around extents | |
| 71131 | Wreck | 401775 | 5856176 | New | 50m around extents | |
| 71162 | Wreck | 401376 | 5854164 | New | 50m around extents | |
| 71172 | Wreck | 401255 | 5855809 | New | 50m around extents | |
| 71176 | Wreck | 401228 | 5854614 | New | 50m around extents | |
| 71181 | Wreck | 401163 | 5854662 | New | 50m around extents | |
| 71188 | Wreck | 400957 | 5857290 | New | 50m around extents | |

- 10.2.8 Of the 19 A1 anomalies without AEZs, two debris fields and seven objects of debris likely to be related to the wrecks are covered within the AEZs listed above. In addition, there are two small objects of debris with very high magnetic anomalies associated and eight magnetic only A1 anomalies. These have not been assigned AEZs as it is not possible to say with certainty that they are of archaeological interest. However, there does appear to be a substantial amount of ferrous material at these locations and these anomalies should be considered during planning of the development and impacts to them avoided where possible.
- 10.2.9 For features assigned A2 archaeological potential rating, no AEZs are recommended at this time. Similarly, based on the nature of the records associated with the A3 archaeological potential rating, no AEZs are currently recommended. However, an avoidance strategy with respect to these A2 and A3 anomalies is advised where possible. Further work may be necessary to ascertain the precise nature and archaeological potential of individual features should avoidance prove unfeasible.

Reduction

- 10.2.10 Reduction of impact can be achieved by means of receiving prompt archaeological advice in the event of a discovery and by recording and conserving any objects that have been disturbed. In a marine environment, this is often achieved by means of implementing a protocol for reporting finds of archaeological interest. It is recommended that if any objects of possible archaeological interest are recovered during any groundwork operations, that they should be reported using the established *Protocol for Archaeological Discoveries: Offshore Renewables Projects* (The Crown Estate, 2014). This will establish whether the recovered objects are of archaeological interest and recommend appropriate mitigation measures where necessary.
- 10.2.11 Furthermore, a number of palaeogeographic features of archaeological potential have been identified within the study area, and sediments of archaeological and palaeoenvironmental interest have been recovered within the geotechnical samples. Of these samples, it was recommended a programme of Stage 2 geoarchaeological recording be carried out on sediments from 22 vibrocores, to further ascertain their nature and determine their archaeological potential. This work is currently being undertaken by Wessex Archaeology, and the data will be integrated into the deposit model. The overall aim of this work will be to understand which deposits are of archaeological significance and if warranted to identify those deposits which have potential for Stage 3 work. Further details regarding this recommendation is presented in *Norfolk Vanguard Offshore Wind Farm, Stage 1 Geoarchaeological Review* (Wessex Archaeology, 2017).
- 10.2.12 It is also recommended that should further geophysical survey or geotechnical sampling be undertaken in the area archaeological input into the survey locations, data obtained, and sampling strategy should be considered.

Remedying and Offsetting

- 10.2.13 Remedying and offsetting could include re-stabilising sites after they have been disturbed or archaeologically recording sites that cannot be preserved.

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12 APPENDICES

12.1 Appendix I: Legislative, Policy and Guidance

Global Policy and Legislation

| Legislation/Policy | Summary |
|---|---|
| The World Heritage Convention 1972 | The Convention provides for the identification, protection, conservation and presentation of cultural and natural sites of 'outstanding universal value' for inscription on the World Heritage List. The Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The 1972 UNESCO World Heritage Convention was ratified by the UK in 1984 and the UK currently has 29 World Heritage Sites. |
| The United Nations Convention on the Law of the Sea 1982 | UNCLOS 1982 was ratified by the UK in 1997. Article 149 applies only to those archaeological and historical objects that lie outside national jurisdiction and stipulates that 'all objects of an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin'. Article 303 stipulates that 'states have the duty to protect objects of an archaeological and historical nature found at sea and shall co-operate for this purpose'. Article 303 also provides for coastal states to exert a degree of control over the archaeological heritage to 24 nm, though the UK has not introduced any measures to implement this right. |
| International Council of Monuments and Sites Charter on the Protection and Management of Underwater Cultural Heritage 1996 (the Sofia Charter) | The Charter upon which the Annex of the UNESCO Convention is largely based includes a series of statements regarding best practice, intending 'to ensure that all investigations are explicit in their aims, methodology and anticipated results so that the intention of each project is transparent to all'. The UK is a member of the International Council of Monuments and Sites. |
| UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001) | The UNESCO Convention was concluded in 2001, and is a comprehensive attempt to codify the law internationally with regards to underwater archaeological heritage. The UK abstained in the vote on the final draft of the Convention, however, it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the convention entered into force on 2nd January 2009 having been signed or ratified by 20 member states. |



European Policy and Legislation

| Legislation/Policy | Summary |
|--|--|
| The European Convention on the Protection of the Archaeological Heritage (Revised) 1992 (The Valletta Convention) | <p>The Articles of the Valletta Convention tackle various aspects. Article 1 deals with the inventorying and protection of sites and areas; Article 2 deals with the mandatory reporting of chance finds and providing for 'archaeological reserves' on land or underwater; Article 3 promotes high standards for all archaeological work undertaken by suitably qualified people; Article 4 requires the conservation of excavated sites and the safe-keeping of finds; and Article 5 is concerned with consultation that should take place between planning authorities and developers to avoid damage to archaeological remains.</p> <p>The Valletta Convention was ratified by the UK Government in 2000 and came into force in 2001. The convention binds the UK to implement protective measures for the archaeological heritage within the jurisdiction of each party, including sea areas. Insofar as the UK exerts jurisdiction over the Continental Shelf, then it would appear that the provisions of the Valletta Convention apply to that jurisdiction.</p> |
| The European Landscape Convention 2000 | <p>The European Landscape Convention became binding on the UK from 1 March 2007. Its principal clauses require the Government to protect and manage landscapes and to integrate landscape into regional and town planning policies including its cultural, environmental, agricultural, social and economic policies. The Convention applies to the entire territory of the UK and includes land, inland water and marine areas. It is not regarded as applying to sea areas regulated by the UK that lie beyond territorial waters.</p> |
| European Directives for Environmental Impact Assessments (2014/52/EU) | <p>The EIA Directive entered into force on 15 May 2014 to simplify the rules for assessing the potential effects of projects on the environment. The newly amended directive replaces former directives (85/337/EEC; 97/11/EC; 2003/35/EC; 2009/31/EC; 2011/92/EU) and Member States must apply these from 16 May 2017 at the latest.</p> |



United Kingdom Policy and Legislation

| Legislation/Policy | Summary |
|---|--|
| Ancient Monuments and Archaeological Areas Act 1979 (as amended) | Scheduled Monuments and Archaeological Areas of Importance (AAIs or their equivalent) are afforded statutory protection and the consent of Secretary of State (DCMS), as advised by Historic England, is required for any works. This Act is primarily used to protect terrestrial site, but has also been used to protect underwater sites. |
| NPPF: Conserving and enhancing the historic environment. Para. 128 | In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation. |
| NPPF: Conserving and enhancing the historic environment. Para. 129 | Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal. |
| NPPF: Conserving and enhancing the historic environment. Para. 132 | When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. |
| NPPF: Conserving and enhancing the historic environment. Para. 135 | The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset. |
| NPPF: Conserving and enhancing the historic environment. Para. 137 | Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites and within the setting of heritage assets to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset should be treated favourably. |
| NPPF: Conserving and enhancing the historic environment. Para. 139 | Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets. |



| Legislation/Policy | Summary |
|--|--|
| NPPF: Conserving and enhancing the historic environment. Para. 141 | Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. |
| Protection of Wrecks Act 1973: Section One | Wrecks and wreckage assessed to be of historical, archaeological or artistic value can be protected by way of site specific designation. It is an offence to carry out certain activities within a defined area surrounding a designated wreck, unless a licence for those activities has been obtained through Historic England. |
| Protection of Wrecks Act 1973: Section Two | This provides protection for wrecks that have been designated as dangerous due to their contents and is administered by the Maritime and Coastguard Agency through the Receiver of Wreck. |
| Protection of Military Remains Act 1986 | Under the Protection of Military Remains Act 1986, all aircraft that have crashed whilst in military service are automatically protected. Maritime vessels (e.g. ships and boats) lost during military service are not automatically protected, although the Ministry of Defence (MoD) has powers to protect any vessel that was in military service when lost. The MoD can designate wrecks whose position is known as 'controlled sites' and can designate named vessels whose location is unknown 'protected places'. It is not necessary to demonstrate the presence of human remains for wrecks to be designated as either 'controlled sites' or 'protected places'. |
| Merchant Shipping Act 1995 | This Act sets out the procedures for determining the ownership of underwater finds classified as 'wreck'; defined as any flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes ship, aircraft, hovercraft, parts of these, their cargo or equipment. If any such finds are brought ashore, the salvor is required to give notice to the Receiver of Wreck that he/she has found or taken possession of them and, as directed by the Receiver, either hold them pending the Receiver's order or deliver them to the Receiver. The Act is administered by the Maritime and Coastguard Agency. Beyond the 12 nm limit, the Merchant Shipping Act 1995 covers wreck found or taken into possession outside UK waters, and stipulates that if brought into UK waters, finds must be reported to the Receiver of Wreck. The provisions of the Protection of Military Remains Act 1986 regarding Controlled Sites are applicable in international waters, though they are only enforceable with respect to British-controlled ships, British citizens and British companies. |
| Marine and Coastal Access Act 2009 | Under this Act the UK was divided into marine planning regions with an associated plan authority responsible for preparing a marine plan for that area. |
| Overarching National Policy Statement for Energy (EN-1) (Department of Energy and Climate Change 2011a) | This National Policy Statement (NPS) sets out national policy for energy infrastructure, and the importance of archaeological assessment in the development process. |



| Legislation/Policy | Summary |
|---|---|
| National Policy Statement for Renewable Energy Infrastructure (EN-3) (Department of Energy and Climate Change 2011b) | This NPS, taken together with the overarching NPS (EN-1), provides the primary basis for decisions by the Planning Inspectorate on renewable energy infrastructure development applications. It sets out the importance of the historic environment and the ways it can be impacted by development, outlines guidance for application assessments, Planning Inspectorate decision making and mitigation measures. |
| National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department of Energy and Climate Change 2011c) | This NPS, taken together with the overarching NPS (EN-1) provides for decision making on above ground electricity lines of 132kV and over and other electricity networks associated with a Nationally Significant Infrastructure Project e.g. substations and converted stations. |
| Marine Policy Statement 2011 | The Marine Policy Statement was jointly published by all UK Administrations in March 2011 as part of a new system of marine planning being introduced across UK seas. |
| Marine Planning 2012 – East Marine Plans | This was a development of the Marine Plan which apply the MPS framework at a national, regional and area specific level. It includes the East Inshore and Offshore Areas in a process of Marine Plan development expected to be completed in 2021. |
| Enterprise and Regulatory Reform Act 2013 | This Act was given Royal Assent, and has implications for Listed Buildings and Conservation Areas. A provision for the reduction of legislative burdens, it includes heritage planning regulation (Schedule 17), with amendments to the National Heritage Act 1983, the Town and Country Planning Act 1990, and the Planning (Listed Buildings and Conservation Areas) Act 1990. |

Guidance

| | |
|---|---|
| Code of Practice for Seabed Developers, Joint Nautical Archaeology Policy Committee (Joint Nautical Archaeology Policy Committee 2006) | This voluntary Code provides a framework for seabed developers similar to the principles found in current policy and practice on land. The aim of the Code is to ensure a best practice model for seabed development. The Code offers guidance to developers on issues such as risk management and legislative implications. |
| Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists 2014) | This guidance seeks to define good practice for the execution and reporting of desk-based assessment, in line with the by-laws of the Chartered Institute for Archaeologists. The standard and guidance was formally adopted as approved practice at the Annual General Meeting of the Institute held on 14 October 1994. This revision recognises the new Chartered status of the Institute. |



12.2 Appendix II: Terminology

Glossary

The terminology used in this assessment follows definitions contained within the UK's *National Planning Policy Framework* (Department for Communities and Local Government, 2012: 50-57):

| | |
|---|---|
| Archaeological interest | There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them. |
| Conservation (for heritage policy) | The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance. |
| Designated heritage asset | A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation. |
| Development Plan | This includes adopted Local Plans, neighbourhood plans and the London Plan, and is defined in section 38 of the Planning and Compulsory Purchase Act 2004. |
| Environmental Impact Assessment | A procedure to be followed for certain types of projects to ensure that decisions are made in full knowledge of any likely significant effects on the environment. |
| Heritage asset | A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing). |
| Heritage coast | Areas of undeveloped coastline which are managed to conserve their natural beauty and, where appropriate, to improve accessibility for visitors. |
| Historic environment | All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora. |
| Historic environment record | Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use. |
| Setting of a heritage asset | The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral. |
| Significance (for heritage policy) | The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. |



Chronology

Where referred to in the text, the main archaeological periods in Britain are broadly defined by the following date ranges:

| Period | Date Range |
|--------------------|------------------------|
| Palaeolithic | c. 900,000 BP– 9500 BC |
| Early Post-glacial | 9500 – 8500 BC |
| Mesolithic | 8500 – 4000 BC |
| Neolithic | 4000 – 2200 BC |
| Bronze Age | 2200 – 700 BC |
| Iron Age | 700 BC – AD 43 |
| Romano-British | AD 43 – 410 |
| Early Medieval | 410 – 1085 |
| Medieval | 1085 – 1500 |
| Post-medieval | 1500 – 1800 |
| 19th century | 1800 – 1899 |
| Modern | 1900 – present day |

The geological periods and associated Marine Isotope Stages are defined by the following date ranges:

| Period | Date Range | MIS |
|-------------|----------------------|--------|
| Holocene | 11,700 – present day | 1 |
| Devensian | 115,000 – 11,700 BP | 5d – 2 |
| Ipswichian | 130,000 – 115,000 BP | 5e |
| Saalian | 374,000 – 130,000 BP | 10 – 6 |
| Hoxnian | 424,000 – 374,000 BP | 11 |
| Anglian | 478,000 – 424,000 BP | 12 |
| Pre-Anglian | >478,000 BP | >12 |



12.3 Appendix III: Palaeogeographic Features of Archaeological Potential in NV East

| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|---------------------|-------------------------------|--|-------------------------|
| 75000 | Infilled Depression | P2 | Broad, approximately NNW-SSE trending, unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by sub-parallel internal reflectors. Feature acoustically blanked (probably by shallow gas) along its western edge so exact extent unknown, although it is likely to be part of feature 75003. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 4.1m - 31.9m BSB. | Ipswichian or Devensian |
| 75001 | Acoustic Blanking | P2 | Small area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Only identified on one survey line. Depth Range: 11.6m - 11.7m BSB. | Devensian |
| 75002 | Acoustic Blanking | P2 | Extensive, approximately NNW-SSE trending area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 3.5m - 26.3m BSB. | Devensian |
| 75003 | Infilled Depression | P2 | Broad, approximately NNW-SSE trending, unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by sub-parallel internal reflectors. Feature acoustically blanked (probably by shallow gas) along its eastern edge so exact extent unknown, although it is likely to be part of feature 75000. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 7.5m - 26.8m BSB. | Ipswichian or Devensian |
| 75004 | Acoustic Blanking | P2 | Extensive, approximately NNW-SSE trending area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 3.5m - 26.3m BSB. | Devensian |
| 75005 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 6.7m - 7.9m BSB. | Devensian |
| 75006 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 7.8m - 12.3m BSB. | Devensian |
| 75007 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 7.1m - 10.1m BSB. | Devensian |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|-------------------------|
| 75008 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Only identified on one survey line. Depth Range: 8.9m - 9.7m BSB. | Devensian |
| 75009 | Infilled Depression | P2 | Broad unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by poorly defined sub-parallel internal reflectors. Possible second phase of acoustically unstructured fill in some areas, though this is unclear. Unit is acoustically blanked (probably by gas) along its eastern edge, and so extent is unknown. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 8.6m - 25.5m BSB. | Ipswichian or Devensian |
| 75010 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Depth Range: 7.6m - 11.7m BSB. | Devensian |
| 75011 | Infilled Depression | P2 | Broad, approximately NNW-SSE trending, unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by poorly defined sub-parallel internal reflectors. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 6.8m - 18.0m BSB. | Ipswichian or Devensian |
| 75012 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Only identified on a single survey line. Depth Range: 10.3m - 11.1m BSB. | Devensian |
| 75013 | Acoustic Blanking | P2 | Area of acoustic blanking within BNB Formation (Unit 5), probably caused by shallow gas and indicative of organic material within the sediment. Only identified on a single survey line. Depth Range: 9.8m - 11.0m BSB. | Devensian |
| 75014 | High Amplitude Reflector | P1 | Area of intermittent high amplitude reflectors, possibly within YM Formation (Unit 2) although this is unclear. Possibly indicative of preserved organic material. Depth Range: 13.7m - 19.0m BSB. | Pre-Anglian |
| 75015 | Infilled Depression | P2 | Broad unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by poorly defined sub-parallel internal reflectors. Possible second phase of acoustically unstructured fill in some areas, though this is unclear. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 6.2m - 38.9m BSB. | Ipswichian or Devensian |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|---------------------|-------------------------------|---|-------------------------|
| 75016 | Infilled Depression | P2 | Unit below the base of BNB Formation (Unit 5), appears to be the fill of a topographically controlled depression. Characterised by a single phase of fill characterised by numerous sub-parallel internal reflectors. Unit not definitely known, but could be EE or an early deposit of BNB (Unit 4). Depth Range: 5.7m - 10.7m BSB. | Ipswichian or Devensian |
| 75017 | Infilled Depression | P2 | Unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by poorly defined sub-parallel internal reflectors. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Present within both NV East and the ECR. Depth Range: 6.1m - 13.6m BSB. | Ipswichian or Devensian |



12.4 Appendix IV: Palaeogeographic Features of Archaeological Potential in NV West

| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75018 | High Amplitude Reflector | P1 | Extensive, relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is occasionally cut/disrupted by cut and fill features, particularly channel 75021. Peat recovered from vibrocore VC088 suggest this represents a buried land surface (Unit 7). Depth Range: 0.8 - 5.8m BSB. | Holocene (Pre-Transgression) |
| 75019 | Simple Cut and Fill | P2 | Small, relatively poorly defined possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of fill, with relative strong basal reflector. Possible remains of a fluvial feature associated with the same surface as high amplitude reflector 75018 (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth Range: 2.0 - 3.1m BSB. | Holocene (Pre-Transgression) |
| 75020 | Simple Cut and Fill | P2 | Small, relatively poorly defined possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of fill, with poorly defined basal reflector. Possible remains of a fluvial feature associated with the same surface as high amplitude reflector 75018 (Unit 7), although could be an internal reflector. Depth range: 4.0 - 7.0m BSB. | Holocene (Pre-Transgression) |
| 75021 | Channel | P1 | Relatively small but distinct channel feature cut into the BNB Formation (Unit 5), identified on a number of survey lines. Relatively poorly defined basal reflector, with a single phase of acoustically chaotic fill. Possible fluvial feature, possibly associated with channel 75025 and the same surface as high amplitude reflectors 75018, 75023 and 75022 (Unit 7). Depth Range: 1.5 - 6.5m BSB. | Holocene (Pre-Transgression) |
| 75022 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is cut/disrupted by channel 75021. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 2.1 - 4.2m BSB. | Holocene (Pre-Transgression) |
| 75023 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is cut/disrupted by channel 75021. Peat recovered from vibrocore VC085 suggest this represents a buried land surface (Unit 7). Depth Range: 1.6 - 3.8m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75024 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is cut/disrupted by channel 75025. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 0.8 - 3.0m BSB. | Holocene (Pre-Transgression) |
| 75025 | Channel | P1 | Relatively small but distinct channel feature cut into the BNB Formation (Unit 5), identified on a number of survey lines. Relatively poorly defined basal reflector, with a single phase of acoustically chaotic fill. Possible fluvial feature, possibly associated with channel 75021 and the same surface as high amplitude reflector 75024 (Unit 7). Depth Range: 1.6 - 6.7m BSB. | Holocene (Pre-Transgression) |
| 75026 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line, but probably related to similar feature 75028. Feature is cut/disrupted by cut and fill feature 75027. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 2.4 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75027 | Simple Cut and Fill | P2 | Small, relatively poorly defined possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of fill, with relative strong basal reflector. Possible remains of a fluvial feature associated with the same surface as high amplitude reflectors 75028 and 75026 (Unit 7), although could be an internal reflector. Identified on two survey lines. Depth Range: 1.6 - 5.4m BSB. | Holocene (Pre-Transgression) |
| 75028 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is cut/disrupted by cut and fill feature 75027. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.6 - 5.4m BSB. | Holocene (Pre-Transgression) |
| 75029 | High Amplitude Reflector | P1 | Extensive, relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on numerous survey lines. Feature is intermittent in places, but closely spaced anomalies have been grouped together. Feature is occasionally cut/disrupted by cut and fills, particularly channels 75035 and 75038. Peat recovered from vibrocores VC075, VC076, and VC080, plus roots recovered from vibrocore VC081, suggest this represents a buried land surface (Unit 7). Depth Range: 0.6 - 10.5m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75030 | Simple Cut and Fill | P2 | Small, possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of layered fill, with a well defined basal reflector. Possible remains of a fluvial feature associated with the same surface as high amplitude reflector 75029 (Unit 7), although could be an internal reflector. Depth range: 2.5 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75031 | Simple Cut and Fill | P2 | Small, possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of layered fill, with a well defined basal reflector. Possible remains of a fluvial feature, possibly associated with the same surface as high amplitude reflector 75029 (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth range: 3.6 - 4.8m BSB. | Holocene (Pre-Transgression) |
| 75032 | Simple Cut and Fill | P2 | Possible cut and fill feature cut into BNB Formation (Unit 5). Relatively poorly defined basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial feature, possibly associated with the same surface as high amplitude reflector 75029 (Unit 7), although could be an internal feature. Depth Range: 3.2 - 7.9m BSB. | Holocene (Pre-Transgression) |
| 75033 | Simple Cut and Fill | P2 | Distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with a single phase of acoustically structured fill. Possible remnants of a fluvial channel, possibly relating to the same surface as high amplitude reflector 75029 (Unit 7). Depth Range: 1.6 - 5.2m BSB. | Holocene (Pre-Transgression) |
| 75034 | Simple Cut and Fill | P2 | Distinct cut and fill feature cut into BNB Formation (Unit 5). Distinct basal reflector with a single phase of acoustically structured fill. Possible remnants of a fluvial channel, possibly relating to the same surface as high amplitude reflector 75029 (Unit 7). Depth Range: 1.5 - 8.4m BSB. | Holocene (Pre-Transgression) |
| 75035 | Channel | P1 | Distinct channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Poorly defined basal reflector with a single phases of acoustically layered fill. Possible fluvial feature, possibly associated with the same surface as high amplitude reflector 75029 (Unit 7). Depth Range: 2.4 - 13.0m BSB. | Holocene (Pre-Transgression) |
| 75036 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Feature is cut/disrupted by channel 75035. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.3 - 6.4m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75037 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.3 - 4.5m BSB. | Holocene (Pre-Transgression) |
| 75038 | Channel | P1 | Distinct channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Poorly defined basal reflector with a single phases of acoustically layered fill. Possible fluvial feature, possibly associated with the same surface as high amplitude reflectors 75029 and 75039 (Unit 7). Depth Range: 1.3 - 7.7m BSB. | Holocene (Pre-Transgression) |
| 75039 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Feature is cut/disrupted by channel 75038. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 4.2m BSB. | Holocene (Pre-Transgression) |
| 75040 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 2.7m BSB. | Holocene (Pre-Transgression) |
| 75041 | Simple Cut and Fill | P2 | Distinct cut and fill feature cut into BNB Formation (Unit 5). Distinct basal reflector with a single phase of acoustically structured fill. Possible remnants of a fluvial channel, possibly relating to the same surface as high amplitude reflector 75029 (Unit 7). Depth Range: 4.7 - 8.7m BSB. | Holocene (Pre-Transgression) |
| 75042 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Feature is cut/disrupted by cut and fill 75043. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 3.3 - 4.2m BSB. | Holocene (Pre-Transgression) |
| 75043 | Simple Cut and Fill | P2 | Possible cut and fill feature cut into BNB Formation (Unit 5). Relatively poorly defined basal reflector with single phase of unstructured fill. Possible remnants of a fluvial feature, possibly associated with the same surface as high amplitude reflector 75029 (Unit 7), although could be an internal reflector. Depth Range: 4.2 - 6.6m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75044 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.8 - 4.2m BSB. | Holocene (Pre-Transgression) |
| 75045 | Channel | P1 | Possible channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Relatively poorly defined basal reflector, with a single phase of acoustically layered fill. Possible buried fluvial feature (Unit 7). Depth Range: 1.6 - 9.0m BSB. | Holocene (Pre-Transgression) |
| 75046 | Simple Cut and Fill | P2 | Small, possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of layered fill, with a well defined basal reflector. Possible remains of a fluvial feature (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth range: 1.4 - 3.4m BSB. | Holocene (Pre-Transgression) |
| 75047 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.0 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75048 | Simple Cut and Fill | P2 | Small, possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of layered fill, with a well defined basal reflector. Possible remains of a fluvial feature (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth range: 2.4 - 4.6m BSB. | Holocene (Pre-Transgression) |
| 75049 | Simple Cut and Fill | P2 | Small, possible cut and fill feature cut into BNB Formation (Unit 5). Single phase of layered fill, with a well defined basal reflector. Possible remains of a fluvial feature (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth range: 1.4 - 2.8m BSB. | Holocene (Pre-Transgression) |
| 75050 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.4 - 2.3m BSB. | Holocene (Pre-Transgression) |
| 75051 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.1 - 3.9m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75052 | Acoustic Blanking | P2 | Irregular area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth Range: 2.3 - 4.8m BSB. | Holocene (Pre-Transgression) |
| 75053 | Simple Cut and Fill | P2 | Possible poorly defined cut and fill feature cut into BNB Formation (Unit 5). Poorly defined basal reflector with single phase of acoustically transparent fill. Possible remnant fluvial feature, possibly associated with the same surface as high amplitude reflector 75054 (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth Range: 2.9 - 4.6m BSB. | Holocene (Pre-Transgression) |
| 75054 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Feature is cut/disrupted by cut and fill 75053. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.5 - 4.2m BSB. | Holocene (Pre-Transgression) |
| 75055 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by possible poorly developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 3.3 - 9.3m BSB. | Devensian |
| 75056 | Acoustic Blanking | P2 | Area of acoustic blanking within the lower layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material. Identified on more than one survey line. Depth Range: 9.9 - 12.4m BSB. | Devensian |
| 75057 | Acoustic Blanking | P2 | Small area of acoustic blanking within the lower layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material. Only identified on one survey line. Depth Range: 11.2 - 11.9m BSB. | Devensian |
| 75058 | Simple Cut and Fill | P2 | Relatively poorly defined cut and fill feature cut into BNB Formation (Unit 5), identified on more than one survey line. Intermittent basal reflector with a single phase of acoustically unstructured fill. Possible remnants of a fluvial system, possibly related to the same surface as high amplitude reflector 75029 (Unit 7). Depth Range: 2.4 - 6.3m BSB. | Holocene (Pre-Transgression) |
| 75059 | Simple Cut and Fill | P2 | Possible poorly defined cut and fill feature cut into BNB Formation (Unit 5). Poorly defined basal reflector with single phase of acoustically transparent fill. Possible remnant fluvial feature, possibly associated with the same surface as high amplitude reflector 75029 (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth Range: 3.6 - 6.8m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75060 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Feature is cut/disrupted by channel 75061. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.2 - 5.6m BSB. | Holocene (Pre-Transgression) |
| 75061 | Channel | P1 | Small but distinct channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Generally well defined basal reflector with a single phases of acoustically transparent fill. Possible buried fluvial feature, possibly associated with the same surface as high amplitude reflector 75060 (Unit 7). Depth Range: 1.3 - 4.4m BSB. | Holocene (Pre-Transgression) |
| 75062 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth Range: 2.2 - 2.8m BSB. | Devensian |
| 75063 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 2.6m BSB. | Holocene (Pre-Transgression) |
| 75064 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth Range: 2.0 - 2.9m BSB. | Devensian |
| 75065 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on a number of survey lines. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth Range: 1.6 - 3.2m BSB. | Devensian |
| 75066 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth Range: 2.0 - 2.5m BSB. | Devensian |
| 75067 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.4 - 2.5m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75068 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.2 - 1.9m BSB. | Holocene (Pre-Transgression) |
| 75069 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth Range: 1.2 - 1.4m BSB. | Devensian |
| 75070 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 1.7m BSB. | Holocene (Pre-Transgression) |
| 75071 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 0.9m BSB. | Holocene (Pre-Transgression) |
| 75072 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.9m BSB. | Holocene (Pre-Transgression) |
| 75073 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.3 - 2.8m BSB. | Holocene (Pre-Transgression) |
| 75074 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth Range: 3.6 - 4.1m BSB. | Devensian |
| 75075 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.0 - 3.6m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75076 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on more than one survey line. Feature is cut/disrupted by cut and fill feature 75077. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.6 - 5.4m BSB. | Holocene (Pre-Transgression) |
| 75077 | Channel | P1 | Distinct channel feature cut into BNB Formation (Unit 5), identified on more than one survey line. Poorly defined basal reflector with a single phase of acoustically layered fill. Possible fluvial feature, possibly associated with the same surface as high amplitude reflectors 75076 and 75078 (Unit 7). Depth Range: 2.0 - 8.8m BSB. | Holocene (Pre-Transgression) |
| 75078 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on more than one survey line. Feature is cut/disrupted by cut and fill feature 75077. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.3 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75079 | Simple Cut and Fill | P2 | Distinct cut and fill feature cut into BNB Formation (Unit 5). Distinct basal reflector with a single phase of acoustically structured fill. Possible remnants of a fluvial channel (Unit 7), although only identified on one survey line. Depth Range: 2.0 - 6.5m BSB. | Holocene (Pre-Transgression) |
| 75080 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.2 - 4.6m BSB. | Holocene (Pre-Transgression) |
| 75081 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by possible poorly developed dune features, suggesting a significant time of exposure. Possible buried land surface (Unit 7). Depth Range: 2.7 - 5.0m BSB. | Devensian |
| 75082 | High Amplitude Reflector | P1 | Relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)), identified on a number of survey lines. Peat recovered from within similar features suggest this represents a buried land surface (Unit 7). Depth Range: 1.5 - 3.3m BSB. | Holocene (Pre-Transgression) |
| 75083 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 2.5m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75084 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line, and located at the edge of the area. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.3 - 2.0m BSB. | Holocene (Pre-Transgression) |
| 75085 | Simple Cut and Fill | P2 | Small but distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial system (Unit 7). Depth Range: 2.6 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75086 | Simple Cut and Fill | P2 | Small but distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial system (Unit 7). Depth Range: 2.0 - 4.8m BSB. | Holocene (Pre-Transgression) |
| 75087 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line, and reflector extends over the top of cut and fill features 75085 and 75087. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.0 - 3.3m BSB. | Holocene (Pre-Transgression) |
| 75088 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.6 - 3.2m BSB. | Holocene (Pre-Transgression) |
| 75089 | High Amplitude Reflector | P1 | Area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line, and reflector is situated partially on top of channel feature 75092. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 2.8m BSB. | Holocene (Pre-Transgression) |
| 75090 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.6 - 2.5m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75091 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 0.8 - 1.7m BSB. | Holocene (Pre-Transgression) |
| 75092 | Channel | P1 | Small but distinct channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Generally well defined basal reflector with a single phase of acoustically transparent fill. Possible buried fluvial feature (Unit 7). Depth Range: 1.3 - 4.8m BSB. | Holocene (Pre-Transgression) |
| 75093 | High Amplitude Reflector | P1 | Area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line, and reflector is situated partially on top of channel feature 75092. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.7 - 3.2m BSB. | Holocene (Pre-Transgression) |
| 75094 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line, but is close to the edge of channel 75092. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.0 - 1.2m BSB. | Holocene (Pre-Transgression) |
| 75095 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.2 - 2.3m BSB. | Holocene (Pre-Transgression) |
| 75096 | Simple Cut and Fill | P2 | Small but distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial system (Unit 7). Depth Range: 1.7 - 4.4m BSB. | Holocene (Pre-Transgression) |
| 75097 | Simple Cut and Fill | P2 | Possible poorly defined cut and fill feature cut into BNB Formation (Unit 5). Poorly defined basal reflector with single phase of acoustically transparent fill. Possible remnant fluvial feature (Unit 7), although could be an internal reflector. Only identified on one survey line. Depth Range: 1.8 - 4.8m BSB. | Holocene (Pre-Transgression) |
| 75098 | Simple Cut and Fill | P2 | Small but distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial system (Unit 7), although could be an internal BNB feature. Depth Range: 1.4 - 7.2m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75099 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by large, well-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 3.0 - 7.9m BSB. | Devensian |
| 75100 | Acoustic Blanking | P2 | Long, but relatively narrow, area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on a number of survey lines. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer or erosion surface. Appears to be associated with channels 75103 and 66046. Depth Range: 1.5 - 4.9m BSB. | Devensian |
| 75101 | Simple Cut and Fill | P2 | Possible poorly defined cut and fill feature cut into BNB Formation (Unit 5). Poorly defined basal reflector with single phase of acoustically transparent fill. Possible remnant fluvial feature (Unit 7), although could be an internal reflector. Depth Range: 1.7 -4.2m BSB. | Holocene (Pre-Transgression) |
| 75102 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature, cut through the BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Only identified on one survey line. Possible remnants of a fluvial system (Unit 7). Depth Range: 1.4 - 7.3m BSB. | Holocene (Pre-Transgression) |
| 75103 | Channel | P1 | Poorly defined channel feature (Unit 7) identified on a number of survey lines, cut through BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Depth Range: 1.3 - 6.1m BSB. | Holocene (Pre-Transgression) |
| 75104 | Simple Cut and Fill | P2 | Shallow, possible cut and fill feature cut into BNB Formation (Unit 5), although only identified on one survey line. Strong, well defined basal reflector with single phase of unstructured fill. Possible remnants of an eroded fluvial system (Unit 7), although is located in an area of shallow gas and so may be associated. Depth Range: 0.8 - 3.7m BSB. | Holocene (Pre-Transgression) |
| 75105 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.2 - 1.7m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75106 | High Amplitude Reflector | P1 | Area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on more than one survey line. Feature is cut/disrupted by cut and fills 75107 and 75108, and partially overlaps possible shallow gas 75100. Peat recovered from within similar features suggest it could be an area of buried land surface (Unit 7). Depth Range: 0.5 - 3.4m BSB. | Holocene (Pre-Transgression) |
| 75107 | Simple Cut and Fill | P2 | Shallow, possible cut and fill feature cut into BNB Formation (Unit 5), identified on more than one survey line. Strong, well defined basal reflector with single phase of unstructured fill. Possible remnants of an eroded fluvial system (Unit 7), although is located in an area of shallow gas and so may be associated. Depth Range: 0.8 - 2.6m BSB. | Holocene (Pre-Transgression) |
| 75108 | Simple Cut and Fill | P2 | Shallow, possible cut and fill feature cut into BNB Formation (Unit 5), although only identified on one survey line. Strong, well defined basal reflector with single phase of unstructured fill. Possible remnants of an eroded fluvial system (Unit 7), although is located in an area of shallow gas and so may be associated. Depth Range: 1.2 - 2.7m BSB. | Holocene (Pre-Transgression) |
| 75109 | Simple Cut and Fill | P2 | Small but distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with single phase of acoustically layered fill. Possible remnants of a fluvial system (Unit 7). Depth Range: 1.7 - 4.4m BSB. | Holocene (Pre-Transgression) |
| 75110 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer or erosion surface. Appears to be associated with channel 75112. Only identified on one survey line. Depth Range: 2.7 - 3.2m BSB. | Devensian |
| 75111 | Simple Cut and Fill | P2 | Possible poorly defined cut and fill feature cut into BNB Formation (Unit 5), only identified on one survey lines. Very poorly defined basal reflector with single phase of acoustically transparent fill. Possible remnants of an eroded fluvial system (Unit 7). Depth Range: 2.7 - 5.2m BSB. | Holocene (Pre-Transgression) |
| 75112 | Channel | P1 | Distinct shallow channel feature cut into BNB Formation (Unit 5), identified on a number of survey lines. Well defined basal reflector with a single phase of acoustic unstructured fill, often associated with areas of possible shallow gas within BNB. Possible buried fluvial feature, possibly associated with the same surface as high amplitude reflector 75113 (Unit 7). Depth Range: 1.4 - 5.4m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75113 | High Amplitude Reflector | P1 | Extensive area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5) (possibly above a thin layer of TN Formation (Unit 6)). Identified on a number of survey lines, the feature follows the course of, overlies, and extends slightly beyond, channel 75112. Peat recovered from within similar features suggest it could be the remnants of a buried land surface (Unit 7). Depth Range: 1.0 - 3.6m BSB. | Holocene (Pre-Transgression) |
| 75114 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer or erosion surface. Appears to be associated with channel 75112 (Unit 7). Depth Range: 2.4 - 3.8m BSB. | Devensian |
| 75115 | Erosion Surface | P1 | Extensive internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by large, well-developed dune features, suggesting a significant time of exposure. Possible buried land surface (Unit 7). Depth Range: 1.3 - 9.2m BSB. | Devensian |
| 75116 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature cut into the BNB Formation (Unit 5), identified on more than one survey line. Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial system (Unit 7). Depth Range: 2.1 - 8.8m BSB. | Holocene (Pre-Transgression) |
| 75117 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature cut into the BNB Formation (Unit 5), but only identified on one survey line. Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial system (Unit 7). Depth Range: 1.6 - 6.0m BSB. | Holocene (Pre-Transgression) |
| 75118 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature cut into the BNB Formation (Unit 5), identified on more than one survey line. Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial system (Unit 7). Depth Range: 2.2 - 4.7m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|---------------------|-------------------------------|---|------------------------------|
| 75119 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature cut into the BNB Formation (Unit 5), but only identified on one survey line. Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial system (Unit 7). Depth Range: 1.9 - 5.4m BSB. | Holocene (Pre-Transgression) |
| 75120 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature identified on a number of survey lines, cut through BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial feature (Unit 7). Depth Range: 1.4 - 9.5m BSB. | Holocene (Pre-Transgression) |
| 75121 | simple Cut and Fill | P2 | Poorly defined cut and fill feature only identified on one survey line, cut through BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possible remnants of an eroded fluvial feature (Unit 7). Depth Range: 2.5 - 6.9m BSB. | Holocene (Pre-Transgression) |
| 75122 | Channel | P1 | Poorly defined channel feature identified on a number of survey lines, cut through BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possibly related to nearby cut and fill 75123 (Unit 7). Depth Range: 1.6 - 7.3m BSB. | Holocene (Pre-Transgression) |
| 75123 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature identified on more than one survey line, cut through BNB Formation (Unit 5) and into the underlying YM Formation (Unit 2). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the internal BNB structure and YM/BNB boundary reflector. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined. Possibly related to nearby channel 75122 (Unit 7). Depth Range: 1.4 - 7.3m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|-------------------------|-------------------------------|---|------------------------------|
| 75124 | Simple Cut and Fill | P2 | Distinct cut and fill feature cut into BNB Formation (Unit 5), but only identified on one survey line. Distinct basal reflector with a single phase of acoustically layered fill. Possible remnants of a fluvial channel (Unit 7), possibly relating to features 75122 and 75123, although appears slightly higher in the stratigraphy and is different in character, so may be a later phase feature. Depth Range: 0.6 - 3.9m BSB. | Holocene (Pre-Transgression) |
| 75125 | Channel | P1 | Relatively poorly defined channel feature identified on a number of survey lines, cut into BNB Formation (Unit 5). Very poorly defined basal reflector, but with a relatively strong internal structure characterised by layered reflectors. Possible remains of a fluvial system (Unit 7). Depth Range: 1.6 - 5.8m BSB. | Holocene (Pre-Transgression) |
| 75126 | Simple Cut and Fill | P2 | Poorly defined cut and fill feature only identified on one survey line, cut into BNB Formation (Unit 5). Poorly defined basal reflector, with a single phase of acoustically transparent fill. Possible remnants of an eroded fluvial feature (Unit 7). Depth Range: 2.0 - 4.3m BSB. | Holocene (Pre-Transgression) |
| 75127 | Coarse Sediment Deposit | P2 | Isolated, possible small coarse sediment deposit at the base of BNB Formation (Unit 5), identified on one survey line only. Possible bank deposit or transgression feature. Depth Range: 5.0 - 6.2m BSB. | Ipswichian or Devensian |



12.5 Appendix V: Palaeogeographic Features of Archaeological Potential in the provisional Offshore Cable Corridor

| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|---------------------|-------------------------------|---|------------------------------|
| 75128 | Infilled Depression | P2 | Broad, approximately NNW-SSE trending, unit below the base of BNB Formation (Unit 5), appears to be the fill of a large topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by sub-parallel internal reflectors. Feature appears to extend eastwards into NV East but feature not identified during data interpretation of this area, probably due to differences in data quality. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 7.6m - 12.6m BSB. | Ipswichian or Devensian |
| 75129 | Infilled Depression | P2 | Approximately WNW-ESE trending unit below the base of BNB Formation (Unit 5), appears to be the fill of a topographically controlled depression. Relatively low relief basal reflector with single phase of fill characterised by sub-parallel internal reflectors. Feature appears to extend eastwards into NV East but feature not identified during data interpretation of this area, probably due to differences in data quality. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Depth Range: 7.5m - 26.8m BSB. | Ipswichian or Devensian |
| 75130 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth range: 2.3 - 2.8m BSB. | Devensian |
| 75131 | Channel | P1 | Poorly defined channel feature identified on a number of survey lines cutting into BNB Formation (Unit 5). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined, and apparent blanking of underlying data may indicate the presence of diffuse shallow gas. Feature appears to extend eastwards into NV East but feature not identified during data interpretation of this area, probably due to differences in data quality. Depth Range: 1.1 - 3.9m BSB. | Holocene (Pre-Transgression) |
| 75132 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth range: 1.7 - 2.4m BSB. | Devensian |
| 75133 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth range: 2.0 - 2.3m BSB. | Devensian |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75134 | Acoustic Blanking | P2 | Small area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Only identified on one survey line. Depth range: 2.1 - 2.9m BSB. | Devensian |
| 75135 | Simple Cut and Fill | P2 | Small, simple cut and fill identified beneath a veneer of Holocene sediment, cut into the top of the BNB Formation (Unit 5). Single phase of fill characterised by closely spaced, subparallel horizons, indicating well layered sediment. Some slight blanking of lower horizons. Feature only identified on one line. Depth range: 1.2 - 6.4m BSB. | Holocene (Pre-Transgression) |
| 75136 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on more than one survey line. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth range: 1.6 - 3.9m BSB. | Devensian |
| 75137 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on more than one survey line. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth range: 2.1 - 3.6m BSB. | Devensian |
| 75138 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on more than one survey line. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth range: 2.1 - 3.5m BSB. | Devensian |
| 75139 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5), identified on more than one survey line. Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth range: 1.1 - 6.6m BSB. | Devensian |
| 75140 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5), identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.1 - 3.4m BSB. | Holocene (Pre-Transgression) |
| 75141 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.1 - 3.1m BSB. | Holocene (Pre-Transgression) |
| 75142 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5), identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.9 - 4.5m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|---|------------------------------|
| 75143 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5), identified on more than one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 3.1 - 5.0m BSB. | Holocene (Pre-Transgression) |
| 75144 | Channel | P1 | Poorly defined channel feature identified on a number of survey lines cutting into BNB Formation (Unit 5). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined, and apparent blanking of underlying data may indicate the presence of diffuse shallow gas. Depth Range: 0.3 - 7.0m BSB. | Holocene (Pre-Transgression) |
| 75145 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.5 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75146 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 2.0 - 3.4m BSB. | Holocene (Pre-Transgression) |
| 75147 | High Amplitude Reflector | P1 | Small area of a relatively flat, high amplitude reflector at the top of the BNB Formation (Unit 5). Only identified on one survey line. Peat recovered from within similar features suggest it could be an isolated area of buried land surface (Unit 7). Depth Range: 1.3 - 5.2m BSB. | Holocene (Pre-Transgression) |
| 75148 | Simple Cut and Fill | P2 | Possible simple cut and fill feature identified cutting into the BNB Formation (Unit 5), beneath possible Holocene sediment. Only identified on one survey line. Single phase of acoustically chaotic fill, suggesting well mixed channel fill. Basal reflector very poorly defined. Depth range: 1.0 - 2.6m BSB. | Holocene (Pre-Transgression) |
| 75149 | Simple Cut and Fill | P2 | Possible simple cut and fill feature identified cutting into the BNB Formation (Unit 5), beneath possible Holocene sediment. Only identified on one survey line. Single phase of acoustically chaotic fill, suggesting well mixed channel fill. Basal reflector very poorly defined. Depth range: 1.2 - 3.8m BSB. | Holocene (Pre-Transgression) |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|---------------------|-------------------------------|---|------------------------------|
| 75150 | Channel | P1 | Poorly defined channel feature identified on a number of survey lines cutting into BNB Formation (Unit 5). Very poorly defined basal reflector, and feature is mainly delineated by disruption to the BNB structure. Possible single phase of fill comprising very faint internal reflectors, although the structure cannot be definitively determined, and apparent blanking of underlying data may indicate the presence of diffuse shallow gas. Depth Range: 1.8 - 5.1m BSB. | Holocene (Pre-Transgression) |
| 75151 | Simple Cut and Fill | P2 | Possible simple cut and fill feature identified cutting into the BNB Formation (Unit 5), beneath possible Holocene sediment. Only identified on one survey line. Single phase of acoustically chaotic fill, suggesting well mixed channel fill. Basal reflector very poorly defined. Depth range: 1.2 - 3.8m BSB. | Holocene (Pre-Transgression) |
| 75152 | Infilled Depression | P2 | Localised unit below the base of BNB Formation (Unit 5), appears to be the fill of a topographically controlled depression. Relatively low relief basal reflector with single phase of acoustically chaotic fill. Unit not definitely known, but possibly EE or an earlier BNB unit (Unit 4). Data from vibrocore VC116 suggests the unit comprises dense sand. Depth Range: 5.1m - 10.3m BSB. | Ipswichian or Devensian |
| 75153 | Channel | P1 | Possible channel feature identified cutting into the top of BNB (or possible EE) and YM Formation (Unit 2). Feature has a poorly defined basal reflector and closely spaced, subparallel internal reflectors indicated well layered sediment. Possible remnant fluvial feature. Identified on a number of survey lines. Depth range 1.4 - 10.6m BSB. | Holocene (Pre-Transgression) |
| 75154 | Acoustic Blanking | P2 | Area of acoustic blanking within the upper layers of BNB Formation (Unit 5). Possible accumulation of shallow gas, indicating preserved organic material, although could be a localised gravelly layer. Depth Range: 1.1 - 1.9m BSB. | Devensian |
| 75155 | Simple Cut and Fill | P2 | Possible, poorly defined cut and fill feature identified cutting into BNB Formation (Unit 5), possibly with more than one phase of fill. Fill is characterised by parallel internal reflectors, with some possible blanking of lower horizon. Basal reflector not particularly distinct. Depth range: 1.3 - 7.7 m BSB. | Holocene (Pre-Transgression) |
| 75156 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by relatively poorly-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 4.3 - 11.0m BSB. | Devensian |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|--------------------------|-------------------------------|--|------------------------------|
| 75157 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by relatively poorly-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 4.6 - 9.9m BSB. | Devensian |
| 75158 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by relatively poorly-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 7.4 - 12.8m BSB. | Devensian |
| 75159 | Simple Cut and Fill | P2 | Possible simple cut and fill feature cut into BNB Formation (Unit 5), identified on more than one survey line. Base of feature not particularly distinct, possibly an internal reflector within the possible BNB or EE Formation (Unit 4) or could be the remnants of an eroded fluvial feature. Depth range: 0.5 - 6.9 m BSB. | Holocene (Pre-Transgression) |
| 75160 | High Amplitude Reflector | P1 | High amplitude reflector identified within well layered sediments of interpreted BNB. Some possible blanking of lower horizons. Feature identified on one line. Could indicate shallow gas or a layer of organic material. Depth range: 4.9 - 6.1 m BSB. | Devensian |
| 75161 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by relatively well-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 5.3 - 17.6m BSB. | Devensian |
| 75162 | Erosion Surface | P1 | Internal erosion surface within the BNB Formation (Unit 5), identified on more than one survey line. Overlain by relatively well-developed dune features, suggesting a significant time of exposure. Possible buried land surface. Depth Range: 9.4 - 16.1m BSB. | Devensian |
| 75163 | Simple Cut and Fill | P2 | Cut and fill feature identified cutting into top of the BNB Formation (Unit 5). Feature has a distinct, high amplitude base and possible blanking of lower horizons. Feature identified on one line. Possible remnants of an eroded fluvial feature. Depth range: 0.6 - 2.9 m BSB. | Holocene (Pre-Transgression) |
| 75164 | Simple Cut and Fill | P2 | Possible cut and fill feature identified cutting into possible EE formation (Unit 4). Poorly defined basal reflector with indistinct fill, and only identified on one line, possible continuation of 75165 however this isn't clear. Depth range: 1.0 - 4.2m BSB. | Post-Ipswichian |
| 75165 | Simple Cut and Fill | P2 | Possible cut and fill feature identified cutting into possible EE formation (Unit 4). Poorly defined basal reflector with indistinct fill, and only identified on one line, possible continuation of 75164 however this isn't clear. Depth range: 1.0 - 9.4m BSB. | Post-Ipswichian |
| 75166 | Simple Cut and Fill | P2 | Possible small simple cut and fill feature cut into possible WK Formation (Unit 1). Poorly defined basal reflector with indistinct fill, and only identified on one line. Could be an internal reflector. Depth range: 1.0 - 5.8 m BSB. | Unknown |



| WA ID | Classification | Archaeological Discrimination | Description | Age |
|-------|----------------------|-------------------------------|---|---------|
| 75167 | Complex Cut and Fill | P2 | Possible indistinct complex cut and fill feature cutting into the top of the possible WK Formation (Unit 1). Only identified on one line, possible continuation of 75168 however this isn't clear. Depth range: 0.7 - 4.7 m BSB. | Unknown |
| 75168 | Complex Cut and Fill | P2 | Possible indistinct complex cut and fill feature cutting into the top of the possible WK Formation (Unit 1). Only identified on one line, possible continuation of 75167 however this isn't clear. Depth range: 0.3 - 3.2 m BSB. | Unknown |
| 75169 | Simple Cut and Fill | P2 | Possible small simple cut and fill feature cutting into possible WK Formation (Unit 1). Feature is poorly defined and only identified on one line. Depth range: 0.6 - 2.0 m BSB. | Unknown |
| 75170 | Acoustic Blanking | P2 | Indistinct reflector identified in upper unit beneath seabed, possibly WK Formation (Unit 1). Feature not particularly distinct, but some possible blanking/disturbance to lower horizons indicating possible shallow gas accumulation or a localised gravel deposit. Feature only identified on one line. Depth range 1.8 - 3.3 m BSB. | Unknown |



12.6 Appendix VI: Seabed Anomalies of Archaeological Potential in NV East

Co-ordinates are in ETRS89 UTM Zone 31N.

| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70000 | Magnetic | 503394 | 5861745 | A2 | - | - | - | 547 | Large asymmetrical dipolar anomaly, no recorded wrecks or obstructions and possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70001 | Dark reflector | 504907 | 5861509 | A2 | 0.8 | 0.5 | 0.1 | - | Approximately oval shaped anomaly with a slight L-shape to it, appears partially buried. | |
| 70002 | Magnetic | 504689 | 5861472 | A2 | - | - | - | 20 | Distinct dipolar anomaly on ridge of sandwave, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70003 | Dark reflector | 504173 | 5861185 | A2 | 3.4 | 1.3 | 0 | - | Four oval shaped intermittent anomalies, possibly partially buried object. | |
| 70004 | Magnetic | 503394 | 5861153 | A2 | - | - | - | 11 | Small but distinct dipolar anomaly in an area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70005 | Magnetic | 502797 | 5861124 | A2 | - | - | - | 11 | Negative monopolar anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70006 | Magnetic | 502673 | 5861066 | A2 | - | - | - | 8 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70007 | Magnetic | 499082 | 5861061 | A2 | - | - | - | 8 | Dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70008 | Magnetic | 502893 | 5860998 | A2 | - | - | - | 123 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70009 | Dark reflector | 500616 | 5860788 | A2 | 7.9 | 5.4 | 0.3 | - | Bathymetric anomaly of a possible mound located in an area of sand ripples with a diamond shaped anomaly measuring 3.1m x 2.7m x 0.7m with scour, possibly piece of debris. | |
| 70010 | Dark reflector | 500160 | 5860738 | A2 | 2.5 | 1.7 | 0.2 | - | Almost triangular shaped anomaly with weak tiny circular anomaly nearby, possibly debris. | |
| 70011 | Magnetic | 499005 | 5860571 | A2 | - | - | - | 17 | Asymmetrical dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70012 | Magnetic | 498786 | 5860491 | A2 | - | - | - | 23 | Two anomalies approximate 25m apart and possibly associated. Stronger is a dipole of 23nT with the weaker a small dipole anomaly of 8nT, in an area of noise. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70013 | Magnetic | 503479 | 5860359 | A2 | - | - | - | 10 | Narrow peaked monopolar positive anomaly but in an area of larger broad anomalies possibly natural in origin. | |
| 70014 | Dark reflector | 496046 | 5860324 | A2 | 5.6 | 0.4 | 0 | - | Thick linear anomaly, possibly partially buried, faint scour trailing off one end. | |
| 70015 | Magnetic | 503289 | 5860278 | A2 | - | - | - | 5 | Distinct small dipolar anomaly in area of broad dipolar anomalies, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70016 | Magnetic | 499999 | 5860245 | A2 | - | - | - | 14 | Narrow peaked positive monopolar anomaly, stronger than other anomalies in area that are possibly natural, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70017 | Debris | 501768 | 5860169 | A2 | 10.4 | 3.9 | 0.7 | - | Possible rounded mound located in an area of sand ripples with associated scour on its north-west side visible in the bathymetry data. Complex irregular looking anomaly and weakly contrasting but with a prominent pointed oval shaped shadow with scour. Possibly piece of debris lying on seabed. | |
| 70018 | Magnetic | 503474 | 5860142 | A2 | - | - | - | 5 | Distinct but weak asymmetrical dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70019 | Magnetic | 496390 | 5859947 | A2 | - | - | - | 111 | Distinct asymmetric medium dipole anomaly on single line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70020 | Rope/chain | 498804 | 5859831 | A2 | 18 | 0.7 | 0.1 | - | Narrow curvilinear anomaly possibly rope or chain. | |
| 70021 | Wreck | 496438 | 5859769 | A1 | 21.5 | 9.7 | 0.6 | 62 | Elongated oval shaped area containing several linear crossing dark reflectors showing degrading structure of a wreck partially buried in sediment with two further pieces of debris lying nearby approximately 5.5m x 0.5m and 2m x 0.5m in size. The pieces of debris are both within 10m of the main wreck site. Associated is a very distinct medium sized asymmetric dipole anomaly of 62nT and just to south and possibly associated is a second magnetic small and wide dipole of 19nT suggesting the presence of ferrous material. The wreck is located at the edge of a sandwave in an area of sand ripples. | |
| 70022 | Magnetic | 497097 | 5859655 | A2 | - | - | - | 7 | Small negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70023 | Magnetic | 505096 | 5859429 | A2 | - | - | - | 40 | Distinct asymmetrical dipolar anomaly, possible piece of ferrous, but located on crest of a sandwave, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70024 | Seafloor disturbance | 498418 | 5859302 | A2 | 26 | 3.7 | 0.1 | 19 | Elongated oval shaped area in sand ripples containing at least four short crescent-shaped dark reflectors, possibly partially buried objects. Associated are two magnetic anomalies possibly indicating ferrous material within the seafloor disturbance. | |
| 70025 | Dark reflector | 498638 | 5859111 | A2 | 3.3 | 2.3 | 0 | - | Three parallel short linear anomalies, possibly buried debris. | |
| 70026 | Magnetic | 492881 | 5859097 | A2 | - | - | - | 26 | Small sized dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70027 | Magnetic | 502666 | 5858973 | A2 | - | - | - | 20 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. Slightly to the south of cable visible in magnetic and sidescan sonar data. | |
| 70028 | Dark reflector | 492537 | 5858942 | A2 | 10.1 | 0.8 | 0.1 | - | Two anomalies adjacent to each other which appear partially buried and possibly part of the same feature, a short narrow linear with a sub-rectangular anomaly. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70029 | Magnetic | 494668 | 5858805 | A2 | - | - | - | 36 | Small sized negative dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70030 | Dark reflector | 497304 | 5858631 | A2 | 2.7 | 1.8 | 0.6 | - | Triangular shaped anomaly in scour mark and appears partially buried. | |
| 70031 | Dark reflector | 492935 | 5858549 | A2 | 3.1 | 1.6 | 0.1 | - | Sub-rectangular anomaly with shadow only at one end, possibly a piece of debris. | |
| 70032 | Magnetic | 497868 | 5858486 | A2 | - | - | - | 32 | Distinct small sized dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70033 | Seafloor disturbance | 497923 | 5858432 | A2 | 6.9 | 5.3 | 0 | - | Irregular shaped and complex looking anomaly, possibly debris. | |
| 70034 | Magnetic | 493082 | 5858410 | A2 | - | - | - | 49 | Small asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70035 | Magnetic | 492203 | 5858215 | A2 | - | - | - | 674 | Large asymmetric distinct dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70036 | Dark reflector | 497815 | 5858202 | A2 | 4.2 | 1 | 0.1 | - | Wedge shaped anomaly, possibly partially buried. | |
| 70037 | Dark reflector | 499425 | 5858175 | A2 | 5.1 | 0.3 | 0.1 | - | Narrow linear anomaly, possibly piece of debris. | |
| 70038 | Seafloor disturbance | 494116 | 5858120 | A2 | 3 | 2.9 | 0.5 | - | Approximately circular anomaly, possibly second immediately adjacent but difficult to distinguish, appears partially buried. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70039 | Magnetic | 495993 | 5858052 | A2 | - | - | - | 31 | Small sized positive monopole with weaker asymmetric dipole adjacent, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70040 | Seafloor disturbance | 491024 | 5857988 | A2 | 8.7 | 4.9 | 0.6 | - | Irregular shaped anomaly, mounded area with scour mark, unable to discern any further detail, possibly piece of buried debris. Bathymetry data shows a small depression in an area of sand ripples which corresponds to location of scour, object not visible within it. | |
| 70041 | Dark reflector | 505466 | 5857809 | A2 | 4 | 3.2 | 0.3 | - | Weak approximately rectangular anomaly partially buried in sediment. | |
| 70042 | Seafloor disturbance | 487240 | 5857789 | A2 | 17.9 | 5.7 | 0.7 | - | Strong curvilinear dark reflector, no complex detail suggesting structure seen but large object partially buried in sand ripples. Possibly outline structure of a large object or wreck. In area of mobile sediment and not much more visible. | |
| 70043 | Dark reflector | 490963 | 5857598 | A2 | 2 | 0.5 | 0.3 | - | Short bar shaped anomaly with scour, possibly piece of debris. | |
| 70044 | Dark reflector | 495647 | 5857503 | A2 | 15 | 0.5 | 0 | - | Two anomalies, approximately 15m apart east-west orientation. Smaller is a short narrow linear 5m x 0.5m at edge of range. The larger is an intermittent curvilinear anomaly 11m x 0.5m and possibly length of rope/chain. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70045 | Dark reflector | 495783 | 5857497 | A2 | 35.2 | 0.5 | 0 | - | Three small rectangular anomalies in a linear orientation, possibly all associated and pieces of debris. | |
| 70046 | Magnetic | 487263 | 5857491 | A2 | - | - | - | 24 | Thin and small asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70047 | Debris | 489828 | 5857487 | A2 | 6.9 | 4.9 | 0 | - | Complex looking curvilinear anomaly. | |
| 70048 | Magnetic | 489977 | 5857473 | A2 | - | - | - | 15 | Small but distinct dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70049 | Magnetic | 502862 | 5857341 | A2 | - | - | - | 11 | Distinct small dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70050 | Magnetic | 487263 | 5857272 | A2 | - | - | - | 39 | Narrow and distinct dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70051 | Dark reflector | 498125 | 5857264 | A2 | 15.4 | 0.4 | 0.1 | - | Two small oval shaped anomalies which are possibly opposite ends of single object but buried by sediment in between. | |
| 70052 | Magnetic | 487575 | 5857230 | A2 | - | - | - | 19 | Distinct asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70053 | Dark reflector | 491197 | 5857213 | A2 | 4.1 | 0.7 | 0.2 | - | Short thick linear anomaly with slight curvilinear at one end. Possibly piece of debris. | |
| 70054 | Magnetic | 501273 | 5857103 | A2 | - | - | - | 13 | Narrow positive monopolar anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70055 | Seafloor disturbance | 497740 | 5856926 | A2 | 32.5 | 7 | 0 | - | Irregular shaped area containing a semi-circular dark reflector and several further weak diffuse irregular-shaped dark reflectors. Possibly partially buried or possibly natural. | |
| 70056 | Dark reflector | 505309 | 5856926 | A2 | 9.1 | 0.5 | 0 | - | Short thick linear with weaker curvilinear attached, possibly piece of debris lying on seabed. | |
| 70057 | Magnetic | 495866 | 5856773 | A2 | - | - | - | 62 | Medium distinct asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70058 | Magnetic | 494268 | 5856763 | A1 | - | - | - | 6587 | Very large dipole, possibly wreck anomaly but there is no sidescan sonar or bathymetry anomaly visible at this location and there is not recorded wreck or obstructions at this location. | |
| 70059 | Dark reflector | 492814 | 5856660 | A2 | 7.8 | 2 | 0.1 | - | Irregular shaped anomaly in area of sand ripples, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70060 | Magnetic | 504055 | 5856657 | A2 | - | - | - | 11 | Positive monopolar anomaly, in an area of broader negative anomalies, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70061 | Dark reflector | 485178 | 5856649 | A2 | 5.4 | 3.1 | 0.8 | - | Oval shaped anomaly with tiny circular dark reflectors scattered around it, straight edged shadow, possibly piece of debris. | |
| 70062 | Magnetic | 488589 | 5856545 | A2 | - | - | - | 34 | Small sized asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70063 | Magnetic | 491867 | 5856487 | A2 | - | - | - | 21 | Irregular shaped dipole anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70064 | Seafloor disturbance | 504729 | 5856405 | A2 | 12.4 | 8.8 | 0 | - | Depression orientated approximately north-south and containing numerous small circular dark reflectors, possibly natural in origin but multibeam bathymetry data indicates it is on top of big sandbank, which means more likely to be anthropogenic. | |
| 70065 | Magnetic | 488672 | 5856342 | A2 | - | - | - | 67 | Narrow and distinctive medium dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70066 | Dark reflector | 485119 | 5856280 | A2 | 5.5 | 0.3 | 0.2 | - | Narrow linear anomaly possibly in two pieces and broken up. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70067 | Magnetic | 502260 | 5856204 | A2 | - | - | - | 28 | Asymmetrical dipolar anomaly, stronger anomaly than other on survey line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70068 | Bright reflector | 487554 | 5856136 | A2 | 4.7 | 3.4 | 0.5 | - | Triangular anomaly, difficult to distinguish dark reflector to identify object causing shadow/bright reflector. Scour marks off either side and possibly a piece of debris. Bathymetry anomaly is a possible rounded mound located in an area of sand ripples with associated scour to the north. | |
| 70069 | Magnetic | 505763 | 5856107 | A2 | - | - | - | 13 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70070 | Magnetic | 505161 | 5856080 | A2 | - | - | - | 23 | Irregular looking dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70071 | Rope/chain | 499023 | 5856038 | A2 | 6.3 | 2.8 | 0 | 10 | L-shaped anomaly, slight scour visible off one end. Negative monopolar anomaly at location suggesting presence of ferrous material. | |
| 70072 | Dark reflector | 496642 | 5855951 | A2 | 8 | 0.4 | 0 | - | Curvilinear anomaly with further small circular anomaly nearby, possibly associated. | |
| 70073 | Dark reflector | 500429 | 5855944 | A2 | 6 | 0.4 | 0 | - | Narrow curvilinear anomaly disappearing into the sediment. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70074 | Magnetic | 485967 | 5855913 | A2 | - | - | - | 13 | Distinct and narrow dipolar anomaly possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70075 | Dark reflector | 499246 | 5855881 | A2 | 3.5 | 1.1 | 0.3 | - | Circular shaped anomaly with attached narrow linear in a small hollow in the sediment, scour off one side too. Possibly boulders in depressions. | |
| 70076 | Dark reflector | 484924 | 5855802 | A2 | 13.4 | 3.6 | 0.1 | - | Thick diffuse crescent shaped anomaly and two further, smaller, yet more distinct crescent shaped anomalies in discrete area at edge of range, possibly all associated. | |
| 70077 | Magnetic | 487047 | 5855798 | A2 | - | - | - | 30 | Distinct small sized negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70078 | Magnetic | 489268 | 5855761 | A2 | - | - | - | 24 | Medium sized distinct asymmetric isolated dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70079 | Recorded Obstruction | 485478 | 5855681 | A3 | 2 | 1 | 0.8 | - | An unidentified obstruction, first detected in 1994. Survey data indicates the presence of a very small contact with no associated magnetometric anomaly. The surveyed position of this obstruction is regarded as having an accuracy of 13m. No geophysical anomaly observed in previous zoning assessment or in 2013 data. | 11216 (UKHO) |
| 70080 | Dark reflector | 499103 | 5855643 | A2 | 2.5 | 0.5 | 0.1 | - | Small rectangular anomaly, appears partially buried. | |
| 70081 | Dark reflector | 489787 | 5855640 | A2 | 5.1 | 2.7 | 0.1 | - | Two linear anomalies lying side by side, one slightly larger at 5.1m in length with the second linear 4.1m and appears more intermittent possibly broken up or buried along parts of its length. | |
| 70082 | Magnetic | 489962 | 5855407 | A2 | - | - | - | 18 | Small dipole in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70083 | Dark reflector | 491397 | 5855393 | A2 | 1.1 | 0.2 | 0.2 | - | Short narrow linear. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70084 | Dark reflector | 491241 | 5855392 | A2 | 6.8 | 1.4 | 0 | - | Two oval shaped anomalies lying side by side, at edge of range and when viewed on adjacent line there is an approximately oval shaped bright reflector which was interpreted as part of a sand ripple. Possible oval shaped area of darker reflection but very weak contrast if it is an object here and it does not resemble anomaly on adjacent survey line. | |
| 70085 | Dark reflector | 488532 | 5855336 | A2 | 12.1 | 5.9 | 0 | - | Weak linear dark reflector at different orientation to direction of sand ripples in area. Further small approximate circular anomalies next to it. Possibly piece of debris partially buried. | |
| 70086 | Rope/chain | 490106 | 5855226 | A2 | 67.3 | 0.5 | 0.2 | - | Intermittent short linear dark reflectors in a linear orientation, possibly exposed length or cable. | |
| 70087 | Magnetic | 493570 | 5855185 | A2 | - | - | - | 21 | Small sized asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70088 | Magnetic | 492176 | 5855153 | A2 | - | - | - | 43 | Asymmetric dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70089 | Magnetic | 496642 | 5855051 | A2 | - | - | - | 37 | Distinct narrow dipolar anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70090 | Magnetic | 490850 | 5855047 | A2 | - | - | - | 35 | Small sized negative monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70091 | Bright reflector | 490130 | 5854931 | A2 | 8.5 | 0.5 | 0 | - | Linear anomaly lying across area of sand ripples. | |
| 70092 | Magnetic | 486060 | 5854895 | A2 | - | - | - | 15 | Asymmetric dipole anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70093 | Magnetic | 484178 | 5854884 | A2 | - | - | - | 20 | Small sized, distinct asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70094 | Dark reflector | 493207 | 5854854 | A2 | 25 | 1 | 0.3 | - | Two dark reflectors space approximately 25m apart and possibly associated through their proximity. The larger is a diffuse sub-rectangular shaped anomaly 5.1m x 1m with the second a much smaller triangular anomaly 0.7m x 0.6m x 0.3m. | |
| 70095 | Magnetic | 505371 | 5854790 | A2 | - | - | - | 5 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70096 | Magnetic | 500251 | 5854775 | A2 | - | - | - | 13 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70097 | Rope/chain | 501824 | 5854746 | A2 | 22 | 0.4 | 0 | - | Intermittent curvilinear dark reflector, possibly length of buried rope or chain. | |
| 70098 | Dark reflector | 492205 | 5854602 | A2 | 4.5 | 1.1 | 0 | - | Narrow rectangular anomaly possibly piece of debris. Quite strong return. | |
| 70099 | Magnetic | 488661 | 5854581 | A2 | - | - | - | 9 | Thin and small positive monopole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70100 | Magnetic | 483855 | 5854536 | A2 | - | - | - | 29 | Asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70101 | Dark reflector | 488771 | 5854515 | A2 | 2.1 | 0.7 | 0.4 | - | Short rectangular anomaly with straight edged shadow and slight scour. | |
| 70102 | Magnetic | 503166 | 5854425 | A2 | - | - | - | 11 | Dipolar but possibly similar anomalies along survey line, in an area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70103 | Dark reflector | 484120 | 5854366 | A2 | 3.7 | 0.7 | 0 | - | Curvilinear anomaly at edge of range, in area of sand ripples. | |
| 70104 | Magnetic | 493765 | 5854362 | A2 | - | - | - | 15 | Irregular shaped dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70105 | Dark reflector | 501126 | 5854334 | A2 | 7 | 1.9 | 0.1 | - | Curvilinear anomaly which splits into two linears at one end, possibly piece of debris lying on seabed. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70106 | Magnetic | 489563 | 5854198 | A2 | - | - | - | 33 | Narrow and distinct asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70107 | Magnetic | 493640 | 5854141 | A2 | - | - | - | 9 | Asymmetric dipole in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70108 | Dark reflector | 487600 | 5854137 | A2 | 2 | 0.3 | 0.1 | - | Discrete cluster of three small oval shaped anomalies. | |
| 70109 | Magnetic | 495444 | 5854110 | A2 | - | - | - | 60 | Medium asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70110 | Dark reflector | 487598 | 5854067 | A2 | 11.3 | 3 | 1 | - | Weak semi-circular shaped anomaly with second short curvilinear adjacent and appearing partially buried with weak contrast. | |
| 70111 | Rope/chain | 505646 | 5854054 | A2 | 81.7 | 0.4 | 0 | 15 | Short narrow intermittent linears in a linear orientation, possibly buried cable or seabed scarring. Magnetic anomaly 50m to south-east of a dipolar anomaly, distinct from the larger broader anomalies in the vicinity possibly suggesting presence of ferrous material. | |
| 70112 | Magnetic | 505252 | 5854031 | A2 | - | - | - | 12 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70113 | Magnetic | 501451 | 5853953 | A2 | - | - | - | 12 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70114 | Magnetic | 485244 | 5853882 | A2 | - | - | - | 16 | Small but distinct dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70115 | Debris field | 501902 | 5853766 | A2 | 18.1 | 16.9 | 0.3 | - | One main area containing numerous circular anomalies with two separate larger curvilinear dark reflectors nearby, possible further debris in between. No obvious structure and appears partially buried. Previously recorded as a seafloor disturbance measuring 46m x 32m x 0.3m so the smaller dimensions recorded here possibly show that it has been further buried in sediment since the area was last surveyed. | |
| 70116 | Debris | 495933 | 5853642 | A2 | 6.8 | 0.5 | 0.1 | - | Linear anomaly partially buried in soft sediment, possibly further curvilinear attached could be piece of isolated debris. | |
| 70117 | Magnetic | 495862 | 5853578 | A2 | - | - | - | 36 | Asymmetric dipole in area of noise, possibly natural or possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70118 | Magnetic | 492245 | 5853570 | A2 | - | - | - | 133 | Distinct dipole anomaly, anomaly across two lines, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70119 | Magnetic | 495758 | 5853504 | A2 | - | - | - | 70 | Medium dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70120 | Rope/chain | 492280 | 5853486 | A2 | 119.1 | 0.3 | 0 | | Small intermittent linear dark reflectors in a linear orientation, possibly buried cable. | |
| 70121 | Dark reflector | 487381 | 5853436 | A2 | 4.7 | 4.5 | 0.1 | - | Triangular shaped anomaly with parallel linear dark reflector along one side, partially buried but there is a possibility that the feature is natural. | |
| 70122 | Magnetic | 505966 | 5853429 | A2 | - | - | - | 67 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70123 | Dark reflector | 501789 | 5853412 | A2 | 5.6 | 2.6 | 0 | - | Two oval shaped anomalies side by side. | |
| 70124 | Dark reflector | 494017 | 5853383 | A2 | 4.2 | 3.8 | 0 | - | Irregular shaped anomaly, breaks up the crest of a sand ripple. | |
| 70125 | Dark reflector | 491980 | 5853369 | A2 | 2.3 | 0.7 | 0.1 | - | Sub-oval shaped anomaly with triangular shadow. | |
| 70126 | Magnetic | 501042 | 5853297 | A2 | - | - | - | 12 | Narrow peaked monopolar anomaly, stronger than similar anomalies along survey line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70127 | Magnetic | 486576 | 5853273 | A2 | - | - | - | 33 | Distinct asymmetric small sized dipole, possibly part of a trend but kept due to its strength or possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70128 | Magnetic | 501448 | 5853207 | A2 | - | - | - | 35 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70129 | Dark reflector | 499800 | 5853197 | A2 | 1.8 | 1.7 | 0.4 | - | Oval shaped anomaly, diffuse in appearance with thin narrow linear protruding. | |
| 70130 | Debris | 489326 | 5853090 | A2 | 5.5 | 0.3 | 0.1 | - | Narrow linear anomaly with second separate short linear at one end. | |
| 70131 | Dark reflector | 488985 | 5852970 | A2 | 4 | 0.4 | 0 | - | Narrow, short, slightly curved linear. | |
| 70132 | Dark reflector | 502833 | 5852920 | A2 | 5.1 | 4.1 | 0.8 | - | Partially buried so difficult to see but a linear possibly with second anomaly adjacent whose scour is more prominent. | |
| 70133 | Magnetic | 503572 | 5852838 | A2 | - | - | - | 16 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70134 | Magnetic | 486645 | 5852832 | A2 | - | - | - | 37 | Narrow and distinct dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70135 | Dark reflector | 495005 | 5852802 | A2 | 7 | 3.3 | 0 | - | Curvilinear anomaly, weak and intermittent and appears partially buried, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70136 | Magnetic | 487560 | 5852795 | A2 | - | - | - | 34 | Narrow and distinct asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70137 | Dark reflector | 493518 | 5852779 | A2 | 10.4 | 2.3 | 0.1 | - | Two anomalies adjacent to each other, possibly associated, possibly debris. Circular anomaly and linear narrow anomaly next to it disappearing into the sediment. | |
| 70138 | Dark reflector | 489316 | 5852761 | A2 | 4.9 | 1 | 0 | - | Thick curvilinear anomaly. | |
| 70139 | Dark reflector | 504704 | 5852697 | A2 | 4 | 2.9 | 0.2 | - | Two parallel irregular shaped linears, possibly partially buried debris. | |
| 70140 | Magnetic | 484365 | 5852618 | A2 | - | - | - | 62 | Medium distinct asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70141 | Magnetic | 483846 | 5852465 | A2 | - | - | - | 29 | Small sized possible dipole anomaly, looks more uniform than surrounding data, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70142 | Dark reflector | 503940 | 5852441 | A2 | 1.7 | 0.4 | 0.3 | - | Oval shaped anomaly with rectangular shadow and slight scour. | |
| 70143 | Seafloor disturbance | 487598 | 5852370 | A2 | 12.2 | 7 | 0.3 | - | Semi-circular shaped area of dark reflectors comprising two adjacent curvilinear anomalies. Diffuse with no obvious structure but could be partially buried object, buried at base of sandwave. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70144 | Dark reflector | 487793 | 5852307 | A2 | 3.8 | 0.5 | 0.2 | - | Rectangular anomaly lying on sand ripples. | |
| 70145 | Magnetic | 484434 | 5852277 | A2 | - | - | - | 46 | Distinct asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70146 | Magnetic | 488043 | 5852258 | A2 | - | - | - | 44 | Small sized distinctive asymmetric dipole | |
| 70147 | Magnetic | 491954 | 5852251 | A2 | - | - | - | 218 | Large asymmetric dipole anomaly across adjacent lines, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70148 | Dark reflector | 505075 | 5851991 | A2 | 0.9 | 0.7 | 0.4 | - | Approximately V-shaped anomaly with slight scour, possibly partially buried. Possible extending scour visible as a depression measuring 17.8m x 7.5m x 0.5m in the multibeam bathymetry data. | |
| 70149 | Dark reflector | 489096 | 5851966 | A2 | 2 | 1 | 0.1 | - | Two semi-circular anomalies lying side-by-side. | |
| 70150 | Seafloor disturbance | 492070 | 5851830 | A2 | 13.5 | 12.3 | 0.2 | - | Discrete oval shaped area containing at least three sub-circular dark reflectors, one with height which is measured here. Possibly piece of debris and could indicate further buried debris. Area has harder sediments also compared to surrounding area. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70151 | Magnetic | 503852 | 5851811 | A2 | - | - | - | 8 | Distinct dipolar anomaly in broader area of positive anomalies, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70152 | Magnetic | 492847 | 5851804 | A2 | - | - | - | 28 | Asymmetric dipole, also present on adjacent line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70153 | Dark reflector | 500184 | 5851664 | A2 | 2 | 0.6 | 0.2 | - | Short thick linear, possibly piece of debris. | |
| 70154 | Magnetic | 497146 | 5851631 | A2 | - | - | - | 127 | Medium positive monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70155 | Dark reflector | 500003 | 5851455 | A2 | 4 | 0.4 | 0.1 | - | Strong linear anomaly. | |
| 70156 | Magnetic | 503436 | 5851329 | A2 | - | - | - | 14 | Distinct dipolar anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70157 | Magnetic | 493040 | 5851206 | A2 | - | - | - | 12 | Asymmetric dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70158 | Dark reflector | 490770 | 5851202 | A2 | 2.2 | 0.2 | 0.1 | - | Small, oblong anomaly, isolated. | |
| 70159 | Magnetic | 492545 | 5851167 | A2 | - | - | - | 48 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70160 | Rope/chain | 502675 | 5851160 | A2 | 41.2 | 0.4 | 0 | - | Intermittent linear dark reflector, possibly buried cable or seabed scarring. | |
| 70161 | Dark reflector | 495776 | 5851121 | A2 | 2.5 | 0.3 | 0 | - | Short, narrow linear anomaly. | |
| 70162 | Magnetic | 502739 | 5851034 | A2 | - | - | - | 16 | Negative monopolar anomaly, stonger than other similar anomalies along survey line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70163 | Dark reflector | 493434 | 5851023 | A2 | 3.3 | 0.6 | 0 | - | Curvilinear anomaly, appears partially buried, at edge of range. | |
| 70164 | Magnetic | 485548 | 5850999 | A2 | - | - | - | 34 | Two anomalies approximately 35m apart, asymmetric dipolar anomaly and small sized dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70165 | Rope/chain | 502997 | 5850944 | A2 | 94.2 | 0.6 | 0 | - | Intermittent curvilinear dark reflectors in a curvilinear orientation, possibly buried cable or rope/chain or possibly seabed scarring. | |
| 70166 | Seafloor disturbance | 499790 | 5850889 | A2 | 6.4 | 2.4 | 0.5 | - | Irregular shaped anomaly, possibly piece of debris lying at crest of a sand ripple. | |
| 70167 | Dark reflector | 499228 | 5850858 | A2 | 3.7 | 1.2 | 0.3 | - | Pear drop shaped anomaly with shadow only in the curved part of the anomaly, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70168 | Seafloor disturbance | 501684 | 5850769 | A2 | 13.7 | 13.3 | 0.2 | - | Discrete area containing numerous small circular and short linear dark reflectors, possibly debris but badly degraded and broken up, no structure visible to identify definitely as wreck but possible. | |
| 70169 | Magnetic | 487356 | 5850767 | A2 | - | - | - | 40 | Narrow and distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70170 | Dark reflector | 492800 | 5850749 | A2 | 6.2 | 0.3 | 0 | - | Linear anomaly at different orientation to direction of sand ripples in the area. | |
| 70171 | Dark reflector | 488448 | 5850728 | A2 | 1.9 | 0.5 | 0 | - | Two small circular anomalies lying adjacent to each other. | |
| 70172 | Seafloor disturbance | 492382 | 5850684 | A2 | 33.3 | 20.8 | 0.2 | - | Discrete area in sand ripples containing several circular and curvilinear dark reflectors some with height. Three are possibly in linear orientation. Could indicate buried debris. | |
| 70173 | Dark reflector | 486313 | 5850680 | A2 | 3.8 | 0.3 | 0.3 | - | Narrow, short curvilinear anomaly with uneven height. | |
| 70174 | Dark reflector | 492696 | 5850661 | A2 | 3.2 | 0.6 | 0 | - | Short linear anomaly, possibly partially buried and located approximately 35m to the north-east of debris field anomaly 70176 and possibly further associated debris. | |
| 70175 | Seafloor disturbance | 497297 | 5850658 | A2 | 27.8 | 7.3 | 0 | - | Irregular shaped anomaly that has numerous dark reflectors mostly circular in shape. Possibly object partially or nearly wholly buried. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70176 | Debris field | 492663 | 5850640 | A2 | 16.6 | 12.4 | 0 | - | Irregular shaped discrete area containing several small circular and curvilinear dark reflectors which could be debris on the seabed. | |
| 70177 | Dark reflector | 492580 | 5850624 | A2 | 2.2 | 0.7 | 0.2 | - | Sub-oval shaped anomaly with one part of it exhibiting height. | |
| 70178 | Magnetic | 504025 | 5850596 | A2 | - | - | - | 25 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70179 | Magnetic | 492356 | 5850591 | A2 | - | - | - | 20 | Irregular shaped anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70180 | Dark reflector | 485248 | 5850585 | A2 | 1.1 | 0.6 | 0.2 | - | Small approximately circular anomaly, isolated. | |
| 70181 | Bright reflector | 487994 | 5850520 | A2 | 5.3 | 2.9 | 0 | - | Rectangular anomaly, possibly piece of debris of material such as plastic or rubber or wood. | |
| 70182 | Dark reflector | 497488 | 5850430 | A2 | 2.2 | 0.7 | 0.1 | - | Approximately triangular shaped anomaly partially buried in sediment possibly piece of debris. | |
| 70183 | Magnetic | 500734 | 5850366 | A2 | - | - | - | 46 | Distinct dipolar anomaly, in an area of sand ripples but anomalies responding to those are weaker and follow curvilinear pattern. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70184 | Rope/chain | 492374 | 5850291 | A2 | 40.6 | 0.4 | 0 | - | Intermittent linear dark reflector possibly buried rope/chain or larger object such as cable. | |
| 70185 | Dark reflector | 487927 | 5850289 | A2 | 3.5 | 0.7 | 0.4 | - | Approximately square-shaped anomaly, possibly piece of debris. | |
| 70186 | Magnetic | 502340 | 5850183 | A2 | - | - | - | 20 | Dipolar anomaly, stronger than other dipolar anomalies along survey line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70187 | Debris | 492357 | 5850168 | A2 | 13 | 0.4 | 0 | 65 | Two thick curvilinear anomalies approximately 13m apart. The slightly larger one is 4.4m and the smaller one is 3.7m. A medium magnetic anomaly is associated, indicating ferrous content. | |
| 70188 | Debris | 492166 | 5850155 | A2 | 12.8 | 8.5 | 0 | 20 | Three curvilinear anomalies in a discrete area possibly all part of same object as it looks like the curvilinears disappear into and out of the sediment and therefore partially buried. Approximately 30m to the east is a weak almost triangular dark reflector 3m x 0.7m possibly associated. Magnetic contact therefore possibly debris is ferrous. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70189 | Seafloor disturbance | 484208 | 5850135 | A2 | 22.8 | 8.6 | 0.8 | - | Boomerang shaped dark reflector perpendicular to direction of sand ripples, possibly buried object with height. Second associated narrow linear off one area, full extent unknown as partially buried in sediment, no obvious structure to indicate a wreck but large object nonetheless with scour measuring 7.3m x 5.4m x 1.5m. | |
| 70190 | Dark reflector | 491059 | 5850095 | A2 | 3.3 | 0.4 | 0 | - | Short, weak linear anomaly. | |
| 70191 | Debris field | 502303 | 5850080 | A2 | 14.6 | 2.8 | 0 | - | Discrete area containing at least two objects, weak curvilinear dark reflector 4m x 2.5m and ring shaped dark reflector nearby 1.7m wide, possible further tiny circular dark reflectors are also debris. | |
| 70192 | Dark reflector | 502705 | 5850057 | A2 | 0.9 | 0.7 | 0.2 | - | Approximately circular anomaly in area of sand ripples. | |
| 70193 | Magnetic | 503738 | 5849999 | A2 | - | - | - | 7 | Asymmetrical dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70194 | Dark reflector | 487788 | 5849932 | A2 | 5.1 | 3.1 | 0.4 | - | Approximately rectangular anomaly, possibly with narrow linear coming off one side, appears nearly wholly buried with slight scour. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70195 | Magnetic | 483957 | 5849862 | A2 | - | - | - | 39 | Irregular dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. Two other anomalies are aligned with 70195 in a linear orientation - 70196 and 70198 - they are possibly associated with each other. | |
| 70196 | Magnetic | 483954 | 5849778 | A2 | - | - | - | 37 | Irregular dipole, at the same location as previously identified zoning anomaly. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. Two other anomalies are aligned with 70196 in a linear orientation - 70195 and 70198 - they are possibly associated with each other. | |
| 70197 | Magnetic | 498232 | 5849755 | A2 | - | - | - | 24 | Two adjacent anomalies, a small dipole of 12nT in noisy data and a larger irregular shaped dipole of 24nT. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70198 | Magnetic | 483954 | 5849715 | A2 | - | - | - | 34 | Irregular dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. Two other anomalies are aligned with 70198 in a linear orientation - 70195 and 70196 - they are possibly associated with each other. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70199 | Dark reflector | 490320 | 5849691 | A2 | 18.5 | 1.8 | 0 | - | Diffuse linear anomaly measuring 18.5m x 1.8m and is located approximately 60m to the north-east of debris field anomaly 70202 , possibly associated with it. | |
| 70200 | Magnetic | 502043 | 5849688 | A2 | - | - | - | 10 | Dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70201 | Magnetic | 486621 | 5849687 | A2 | - | - | - | 28 | Small sized asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70202 | Debris field | 490377 | 5849670 | A2 | 25 | 12 | 0.8 | - | Irregular shaped discrete area partially visible in the bathy as an elongated mound overlying sand ripples. Area contains one major curvilinear and several narrow curvilinear dark reflectors but with no obvious structure. Possibly associated is anomaly 70199 approximately 60m to the north-west. | |
| 70203 | Seafloor disturbance | 487053 | 5849457 | A2 | 16 | 5.8 | 0.5 | - | Discrete area containing at least three curvilinear regular spaced dark reflectors with scour coming off each one. No obvious structure therefore not classified as debris or wreck. | |
| 70204 | Dark reflector | 495916 | 5849456 | A2 | 4.1 | 2.2 | 0 | - | Rectilinear anomaly, weak and intermittent, partially buried, possibly piece of debris. | |
| 70205 | Dark reflector | 491997 | 5849437 | A2 | 2.8 | 1.6 | 0.2 | - | Triangular anomaly in area of sand ripples, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70206 | Magnetic | 484545 | 5849367 | A2 | - | - | - | 31 | Distinct wide dipole anomaly in noisy area, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70207 | Magnetic | 490544 | 5849349 | A2 | - | - | - | 37 | Narrow small sized positive monopole in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70208 | Magnetic | 493932 | 5849341 | A2 | - | - | - | 46 | Irregular and wide dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70209 | Magnetic | 484632 | 5849196 | A2 | - | - | - | 41 | Distinct small sized dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70210 | Seafloor disturbance | 487018 | 5849159 | A2 | 24.7 | 4.3 | 0.2 | 13 | Curvilinear diffuse dark reflector, height is a minimum as object at edge of range and data is of average quality, weather noise visible and it appears partially buried. Anomaly has scour and is in an area of slightly raised seabed. Thin and distinctive small negative monopole anomaly indicates possibility of ferrous material. | |
| 70211 | Dark reflector | 493073 | 5849147 | A2 | 3.4 | 0.2 | 0.1 | - | Short thick linear anomaly, possibly piece of debris lying on seabed. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70212 | Dark reflector | 486171 | 5849025 | A2 | 10.3 | 4.9 | 0 | - | Curvilinear dark reflector with further rectangular 'frame' shaped dark reflector attached, possibly piece of debris. | |
| 70213 | Dark reflector | 492690 | 5849012 | A2 | 3.3 | 0.3 | 0.1 | - | Narrow weak linear. | |
| 70214 | Dark reflector | 496592 | 5849011 | A2 | 1.5 | 0.4 | 0 | - | Narrow strong linear, possibly piece of debris lying on seabed. | |
| 70215 | Dark reflector | 491266 | 5848989 | A2 | 5.3 | 0.4 | 0 | - | Short intermittent linear anomaly. | |
| 70216 | Magnetic | 503341 | 5848973 | A2 | - | - | - | 45 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70217 | Magnetic | 496019 | 5848907 | A2 | - | - | - | 10 | Asymmetric distinct dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70218 | Dark reflector | 503180 | 5848758 | A2 | 2.5 | 0.4 | 0.1 | - | Thick short linear with height only at one end. | |
| 70219 | Magnetic | 501631 | 5848736 | A2 | - | - | - | 25 | Positive narrow peaked monopolar anomaly, possibly associated with anomalies 70220 and 70221 making up part of a larger feature. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70220 | Magnetic | 501532 | 5848734 | A2 | - | - | - | 23 | Negative monopolar anomaly, possibly associated with anomalies 70219 and 70221 making up part of a larger feature. Possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70221 | Dark reflector | 501464 | 5848700 | A2 | 6.8 | 0.4 | 0 | - | S-shaped anomaly, possibly length of rope or chain, possibly associated with anomalies 70219 and 70220 making up part of a larger feature. | |
| 70222 | Magnetic | 502144 | 5848683 | A2 | - | - | - | 15 | Dipolar anomaly, stronger than other similar anomalies on survey line. possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70223 | Dark reflector | 491994 | 5848582 | A2 | 25.3 | 0.4 | 0 | - | Three narrow, short intermittent linears measuring between 1.6 to 2.5m in length and 0.3 to 0.4m in width. Only one has height. Possibly linear feature such as a cable but not magnetic contacts associated | |
| 70224 | Dark reflector | 500986 | 5848577 | A2 | 4.2 | 0.3 | 0 | - | Short curvilinear anomaly in area of sand ripples, possibly partially buried. | |
| 70225 | Dark reflector | 500956 | 5848554 | A2 | 4.6 | 0.5 | 0 | - | Narrow linear anomaly, slightly fatter at one end, possibly second tiny linear nearby. | |
| 70226 | Magnetic | 500832 | 5848536 | A2 | - | - | - | 19 | Positive monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70227 | Dark reflector | 486970 | 5848523 | A2 | 3.6 | 0.5 | 0.3 | - | Sub-rectangular anomaly in area of sand ripples, possibly partially buried piece of debris. | |
| 70228 | Magnetic | 500734 | 5848497 | A2 | - | - | - | 34 | Negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70229 | Magnetic | 484020 | 5848428 | A2 | - | - | - | 29 | Small sized positive monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70230 | Debris | 502521 | 5848325 | A2 | 4.3 | 3.6 | 0 | 6 | One linear and one curvilinear anomaly side by side with weak magnetic contact suggesting presence of ferrous material. | |
| 70231 | Magnetic | 498816 | 5848245 | A2 | - | - | - | 42 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70232 | Magnetic | 488544 | 5848226 | A2 | - | - | - | 58 | Asymmetric dipole, very distinctive, could be part of linear alignment, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70233 | Magnetic | 498628 | 5848225 | A2 | - | - | - | 28 | Small sized negative monopole, possibly sandwave but distinct against other anomalies in the area, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70234 | Magnetic | 501630 | 5848215 | A2 | - | - | - | 10 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70235 | Dark reflector | 502685 | 5848184 | A2 | 6.4 | 0.4 | 0 | - | Curvilinear anomaly with one end disappearing into sediment and very weak, possibly piece of partially buried debris. | |
| 70236 | Dark reflector | 494187 | 5848166 | A2 | 3.3 | 0.3 | 0.1 | - | Narrow linear with uneven height. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70237 | Magnetic | 496948 | 5848156 | A2 | - | - | - | 17 | Very distinct, thin symmetric dipole, isolated on one line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70238 | Magnetic | 498933 | 5848154 | A2 | - | - | - | 15 | Negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70239 | Dark reflector | 484465 | 5848117 | A2 | 3.3 | 0.7 | 0 | - | Small rectangular anomaly, in area of sand ripples, is located on the route of a cable but has been kept as it is in a different orientation from the cable anomalies. | |
| 70240 | Dark reflector | 495887 | 5848117 | A2 | 3.9 | 0.3 | 0.3 | - | Narrow linear with large rounded shadow. | |
| 70241 | Magnetic | 488544 | 5848052 | A2 | - | - | - | 71 | Asymmetric dipole, very distinctive, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70242 | Magnetic | 484614 | 5848037 | A2 | - | - | - | 38 | Distinct small sized negative monopole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70243 | Magnetic | 497745 | 5848014 | A2 | - | - | - | 49 | Irregular shaped dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70244 | Dark reflector | 490292 | 5848011 | A2 | 6.3 | 0.5 | 0 | - | Narrow linear lying across sediment. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70245 | Magnetic | 490739 | 5847970 | A2 | - | - | - | 11 | Small asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70246 | Dark reflector | 489010 | 5847966 | A2 | 1.5 | 0.6 | 0.3 | - | Sub-oval shaped small anomaly. | |
| 70247 | Dark reflector | 492329 | 5847948 | A2 | 2.2 | 1.4 | 0.4 | - | Diffuse curvilinear anomaly with several tiny circular anomalies around it. | |
| 70248 | Dark reflector | 496496 | 5847899 | A2 | 1.6 | 1.1 | 0.3 | - | Sub-oval shaped anomaly with slight scour which is possibly a boulder in a depression but due to its locations approximately 60m north-east of wreck 70255 it is potentially inferred as debris. | |
| 70249 | Dark reflector | 487436 | 5847874 | A2 | 9.5 | 3.2 | 0.1 | - | Irregular complex looking anomaly with slight height, possibly piece of debris but there is a possibility that the feature is natural. | |
| 70250 | Debris field | 496455 | 5847872 | A2 | 23.3 | 4.2 | 0.2 | - | At least 5 smaller approximately circular dark reflectors in a discrete area ranging from 0.5m to 2.5m in size and lying approximately 120m from the main wreck area of 70255 . | |
| 70251 | Dark reflector | 484970 | 5847866 | A2 | 8.8 | 6.1 | 1.2 | - | Oval shaped anomaly with weaker, more diffuse irregular shaped area coming off one side. In area of sand ripples. Rectangular 'frame' shaped anomaly with scour obscuring part of the object, in area of sand ripples and appears partially buried, true extent therefore unknown. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70252 | Magnetic | 494540 | 5847865 | A2 | - | - | - | 11 | Small negative monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70253 | Debris | 496470 | 5847849 | A2 | 1.5 | 0.4 | 0.1 | - | Small thick linear dark reflector, possibly associated debris from wreck anomaly 70255 . | |
| 70254 | Dark reflector | 489981 | 5847837 | A2 | 12 | 0.2 | 0.1 | - | Two short, narrow linears one 3m x 0.2m x 0.1m and the second 2.2m x 0.2m x 0.1m. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70256 | Magnetic | 487809 | 5847825 | A2 | - | - | - | 39 | Small sized negative monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70257 | Magnetic | 500622 | 5847810 | A2 | - | - | - | 18 | Distinct dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70258 | Dark reflector | 495584 | 5847766 | A2 | 3.8 | 1.5 | 0 | - | Possibly anthropogenic origin, small oval shaped anomaly at intersection of two orientations of sand ripples. Diffuse and difficult to distinguish shape. | |
| 70259 | Rope/chain | 490067 | 5847758 | A2 | 57.2 | 2.8 | 0 | - | Series of several curvilinear or linear small dark reflectors in a linear orientation. Possibly buried cable causing seafloor disturbance. | |
| 70260 | Magnetic | 486351 | 5847758 | A2 | - | - | - | 18 | Small asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70261 | Debris | 489869 | 5847738 | A2 | 3.8 | 0.5 | 0.1 | 14 | Pointed, sub-oval shaped anomaly with small negative monopole anomaly, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70262 | Wreck | 498353 | 5847680 | A1 | 33.0 | 8.0 | 1.7 | 153 | <p>Discrete area containing several curvilinear and rectilinear dark reflectors 33m x 8m x 1.7m and showing structure of a wreck lying on its side, partially buried in sediment going from sand ripples to coarser sediment. Further small anomalies nearby are debris. Several parallel linear dark reflectors and areas of numerous tiny circular dark reflectors showing nearly wholly buried structure of a wreck, upright, looks like deck structure. Three pieces of potential wreck debris to east and south-east of wreck. Debris ranges in size from 1m x 0.5m x 0.2m to 2.6m x 1.2m and are either oval shaped or square-shaped dark reflectors. Strongest associated magnetic contact at location of wreck is a large negative monopole anomaly. An unknown wreck, first detected in 1994. Survey data indicates that the wreck is small and present in its entirety lying NW/SE, although it is broken up, it measures 30m x 5m x 0.6m. A magnetic anomaly associated with the wreck was also observed. The surveyed position of this wreck is regarded as having an accuracy of 13m.</p> | 11214 (UKHO) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70263 | Debris | 498368 | 5847678 | A2 | 1.1 | 0.6 | 0.2 | - | Small approximately oval shaped dark reflector near wreck 70262 and possibly associated debris. | |
| 70264 | Dark reflector | 486628 | 5847669 | A2 | 6.3 | 1.1 | 0.3 | - | Weak intermittent linear with four separate triangular shadows with overall scour. | |
| 70265 | Debris | 498385 | 5847642 | A2 | 2.6 | 1.2 | 0 | - | Approximately oval shaped dark reflector in vicinity of wreck 70262 and possibly associated. Looks partially buried. | |
| 70266 | Debris | 498770 | 5847617 | A2 | 13.8 | 1.1 | 0.2 | - | Diffuse approximately oval shape with second short narrow linear adjacent and a narrow curvilinear attached, possibly partially buried debris as several anomalies visible in a discrete area. | |
| 70267 | Dark reflector | 491777 | 5847612 | A2 | 2.9 | 0.5 | 0.2 | - | Short bar-shaped anomaly with only a narrow linear shadow at one point, not along full length. | |
| 70268 | Dark reflector | 498171 | 5847533 | A2 | 40 | 3.5 | 0.2 | - | Discrete elongated area containing four anomalies either rectangular in shape or approximately triangular ranging in size from 4.5m x 3.5m x 0.2m to 1.8m x 0.8m x 0.1m. They are all possible associated forming a roughly linear orientation from north to south. | |
| 70269 | Magnetic | 498416 | 5847500 | A2 | - | - | - | 9 | Thin negative small monopole anomaly in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70270 | Magnetic | 501416 | 5847500 | A2 | - | - | - | 22 | Negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70271 | Dark reflector | 501684 | 5847486 | A2 | 7.2 | 0.9 | 0.1 | - | Rectilinear, intermittent anomaly, appears partially buried, possibly piece of debris. | |
| 70272 | Magnetic | 498218 | 5847447 | A2 | - | - | - | 25 | Asymmetric irregular shaped dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70273 | Debris | 485872 | 5847427 | A2 | 16.3 | 5.2 | 0.2 | - | Discrete area on crest of sand ripple containing two curvilinear dark reflectors adjacent to each other with possibly further circular dark reflectors nearby. Possibly further anomalies buried. | |
| 70274 | Magnetic | 489530 | 5847358 | A2 | - | - | - | 39 | Asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70275 | Magnetic | 493723 | 5847351 | A2 | - | - | - | 47 | Asymmetric dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70276 | Magnetic | 501005 | 5847336 | A2 | - | - | - | 16 | Dipolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70277 | Dark reflector | 497835 | 5847280 | A2 | 1.7 | 0.7 | 0.1 | - | Small sub-oval shaped anomaly, appears partially buried. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70278 | Magnetic | 485925 | 5847252 | A2 | - | - | - | 45 | Irregular shaped dipole of 23nT and irregular shaped negative monopole of 45nT, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70279 | Magnetic | 496524 | 5847248 | A2 | - | - | - | 25 | Small sized distinct dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70280 | Magnetic | 501124 | 5847245 | A2 | - | - | - | 33 | Negative monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70281 | Magnetic | 489740 | 5847210 | A2 | - | - | - | 24 | Distinct small sized dipole in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70282 | Debris field | 484776 | 5847154 | A2 | 4.7 | 2.9 | 0.1 | - | Narrow curvilinear, further three very small similar anomalies in immediate vicinity, possibly associated and making up a group of debris. | |
| 70283 | Magnetic | 483815 | 5847110 | A2 | - | - | - | 38 | Small sized possible monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70284 | Dark reflector | 491558 | 5847076 | A2 | 1.3 | 0.7 | 0.1 | - | Two small circular anomalies grouped together, only one has height. | |
| 70285 | Bright reflector | 486522 | 5847068 | A2 | 2.8 | 0.9 | 0 | - | Sub-rectangular anomaly with scour, possibly piece of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70286 | Dark reflector | 495677 | 5847039 | A2 | 3.4 | 1.3 | 0 | - | Adjacent small triangular anomalies, partially buried and possibly a piece of debris. | |
| 70287 | Magnetic | 500212 | 5846982 | A2 | - | - | - | 29 | Negative narrow monopolar anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70288 | Dark reflector | 489235 | 5846982 | A2 | 4.2 | 0.8 | 0 | - | Pointed oval shaped anomaly. | |
| 70289 | Dark reflector | 495462 | 5846968 | A2 | 2.5 | 0.2 | 0 | - | Short narrow linear, in area of sand ribbons. | |
| 70290 | Rope/chain | 496587 | 5846868 | A2 | 130 | 0.9 | 0.1 | - | Intermittent linear bright reflector, possibly seabed scar or buried cable. | |
| 70291 | Magnetic | 489929 | 5846868 | A2 | - | - | - | 67 | Medium negative monopole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70292 | Debris | 489362 | 5846856 | A2 | 1.3 | 0.6 | 0.5 | - | Circular anomaly but with narrow thin, linear, shadow. | |
| 70293 | Dark reflector | 487569 | 5846833 | A2 | 1.5 | 0.4 | 0.3 | - | Circular anomaly with straight edged shadow it is possible debris but could be a boulder | |
| 70294 | Dark reflector | 493264 | 5846790 | A2 | 1.6 | 0.6 | 0 | - | Small pointed oval shaped anomaly, appears partially buried in sediment. | |
| 70295 | Magnetic | 495940 | 5846725 | A2 | - | - | - | 12 | Small but distinct dipole, could be natural or possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70296 | Dark reflector | 491990 | 5846614 | A2 | 2.8 | 0.4 | 0 | - | Narrow rectangular, nearly T-shaped anomaly at edge of range. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70297 | Dark reflector | 492952 | 5846516 | A2 | 5.8 | 3.8 | 0.6 | - | Small sub-oval area of dark reflection and which appears to be partially buried. Possible small shallow areas of scour off either side of object, possibly piece of debris. | |
| 70298 | Dark reflector | 492651 | 5846464 | A2 | 2.7 | 1 | 0.2 | - | Irregular looking oval shaped anomaly, area contains at least three connecting curvilinear dark reflectors, possibly buried object. | |
| 70299 | Dark reflector | 484679 | 5846411 | A2 | 2.4 | 2.2 | 0.3 | - | Square shaped anomaly in area of sand ripples, possibly piece of debris. | |
| 70300 | Dark reflector | 488859 | 5846389 | A2 | 6.3 | 0.6 | 0.1 | - | Strong narrow linear anomaly possibly with weak curvilinear anomaly attached, lying on sediment, possibly piece of debris. | |
| 70301 | Dark reflector | 486924 | 5846351 | A2 | 6.8 | 0.2 | 0.7 | - | Weak narrow linear anomaly in a depression. | |
| 70302 | Magnetic | 495213 | 5846302 | A2 | - | - | - | 37 | Small sized negative monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70303 | Seafloor disturbance | 486469 | 5846205 | A2 | 65 | 11.5 | 1.1 | - | Discrete area measuring 40m x 11.5m x 1m consisting of one larger pointed oval shaped dark reflector with irregular shadow. Main anomaly is surrounded by intermittent curvilinears in no regular order and showing no obvious structure. Appears partially buried with at least one further piece of associated debris 45m to the south-east of the main area in the form of a linear anomaly measuring 6m x 1m x 0.1m. Scour extending immediately north for a distance of up to 50m. Classified as seafloor disturbance as there is no structure visible to confirm it is a wreck. | |
| 70304 | Magnetic | 488007 | 5846204 | A2 | - | - | - | 38 | Small sized negative monopole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70305 | Debris | 488363 | 5846158 | A2 | 5.3 | 4.3 | 0.7 | - | Approximately rectangular frame-shaped anomaly with further linear and circular dark reflector adjacent. | |
| 70306 | Magnetic | 488523 | 5846103 | A2 | - | - | - | 22 | Small and distinct asymmetric dipole, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70307 | Dark reflector | 487339 | 5846089 | A2 | 4.4 | 2.9 | 0 | - | Sub-rectangular, diffuse anomaly, appears partially buried in area of sand ripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70308 | Magnetic | 493406 | 5846085 | A2 | - | - | - | 11 | Distinct small dipole in area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70309 | Magnetic | 491314 | 5846074 | A2 | - | - | - | 16 | Thin asymmetric dipole in a area of noise, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70310 | Dark reflector | 484577 | 5846055 | A2 | 19.6 | 4.3 | 0.9 | - | Elongated depression cutting across sand ripples measuring 10.5m x 7.4m x 0.7m which is a thick bar shaped structure, with narrow linear protruding off shorter end which increases the dimensions of the overall anomaly. Appears partially buried in sediment therefore dimensions are a minimum. | |
| 70311 | Magnetic | 484815 | 5845871 | A2 | - | - | - | 100 | Medium and distinct thin dipole anomaly on one line, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70312 | Debris | 485572 | 5845620 | A2 | 15.5 | 12.5 | 0.4 | - | Irregular shaped discrete area containing a complex anomaly of numerous dark reflectors that suggest structure but weak contrast. Looks broken up and damaged but partially buried so difficult to see full condition. Partially buried therefore true extent unknown. It is situated in trend of high magnetic anomalies and therefore the presence of magnetic material cannot be ruled out. | |
| 70313 | Dark reflector | 488229 | 5845487 | A2 | 3.5 | 2.2 | 0.2 | - | Irregular shaped complex looking anomaly. | |
| 70314 | Magnetic | 484316 | 5845272 | A2 | - | - | - | 90 | Irregular shaped dipole anomaly in noisy area but large magnetic value compared to other anomalies in the area, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70315 | Magnetic | 486921 | 5845260 | A2 | - | - | - | 68 | Distinct dipole anomaly, possibly buried ferrous object as there is no sidescan sonar or bathymetry anomaly visible at this location. | |
| 70316 | Dark reflector | 486968 | 5845181 | A2 | 6.5 | 4.8 | 0.4 | - | Oval shaped anomaly with second but weaker oval anomaly and a narrow curvilinear anomaly adjacent. Appears partially buried in area of sand ripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71480 | Wreck | 503572 | 5848770 | A1 | 64 | 20 | 4.4 | 600 | Wreck of a submarine. Narrow elongated bathymetry anomaly oriented north-east to south-west and measuring 63.2 x 5.8 x 4.m and with an isolated scour to the north-east end. Prominent thick long dark reflector with numerous small linear, curvilinear and circular dark reflectors showing structure of wreck, intact, upright, heavily buried in sediment, disrupts sediment pattern in area with scour of approximately 160m extending to the north-east. Solid large linear dark reflectors showing bulk structure of wreck, possibly on side but looking intact, partially buried in sediment and debris seen scattered in vicinity, potentially more buried. Width of main wreck site is 6m but debris extending from wreck measures up to 20m. Possibly further debris to the south at a distance of approximately 40m from end of wreck shown by two magnetic anomalies | 79542 (UKHO) |



12.7 Appendix VII: Seabed Anomalies of Archaeological Potential in NV West

Co-ordinates are in ETRS89 UTM Zone 31N.

| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71296 | Bright reflector | 470936 | 5876930 | A2 | 5.4 | 4.5 | 0 | - | A large and slightly bulbous bright reflector object located within sandwaves, looks anomalous to the surrounding seabed. | |
| 71297 | Magnetic | 470549 | 5875951 | A1 | - | - | - | 953 | Very large asymmetric dipole identified on more than one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71298 | Debris | 467660 | 5874419 | A2 | 9.6 | 3.6 | 0.5 | - | Large piece of debris, a distinct dark reflector with an irregular shape, has two short and thin curvilinear dark reflectors attached and a bright shadow, isolated on a sandy and even area of the seabed. | |
| 71299 | Magnetic | 471001 | 5874207 | A1 | - | - | - | 1450 | Very large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. Lies approximately 180m west of charted pipeline and not part of linear anomaly associated with it. | |
| 71300 | Dark reflector | 467655 | 5873863 | A2 | 4.4 | 0.7 | 0.2 | - | Small straight object with a bright shadow on a different alignment to sandripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71301 | Debris field | 470711 | 5873567 | A1 | 23.0 | 0.9 | 0.2 | 7022 | Several distinct linear dark reflectors with height identified in an area of megaripples. Features appear to be in a line therefore possibly represent one, partially buried feature such as a possible wreck and, as such, have been grouped together as one. Length measurement represents length of entire feature. Largest individual dark reflector measures 7.6m. Feature has a very large associated magnetic anomaly, indicating ferrous material. | |
| 71302 | Magnetic | 470559 | 5873521 | A2 | - | - | - | 343 | Large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71303 | Dark reflector | 467627 | 5873298 | A2 | 8.1 | 0.9 | 0 | - | A thick linear dark reflector with no shadow, may be geological. | |
| 71304 | Bright reflector | 469341 | 5873168 | A2 | 5.3 | 2.6 | 0 | - | A linear and slightly right angled bright reflector, isolated and distinct feature, in a noisy area. | |
| 71305 | Debris | 467374 | 5872945 | A2 | 4.2 | 2.6 | 0.3 | - | A medium sized piece of possible debris, very distinct square shaped dark reflector with a dull shadow and in a depression, located near sandwaves. | |
| 71306 | Magnetic | 469173 | 5872781 | A2 | - | - | - | 244 | Large negative monopole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71307 | Dark reflector | 464983 | 5872669 | A2 | 7.4 | 1.2 | 0.3 | - | Poorly defined, irregular dark reflector with a shadow at either end. Image possibly distorted by movement of the sonar fish. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71308 | Debris | 471006 | 5872655 | A2 | 3.2 | 1.7 | 0.1 | - | A medium sized oval possible debris feature, distinct dark reflector with a very slight shadow located within sandwaves. | |
| 71309 | Dark reflector | 471069 | 5872611 | A2 | 6.5 | 0.5 | 0 | - | A thick and distinct right angled linear dark reflector with no shadow but in a depression. | |
| 71310 | Magnetic | 470829 | 5872335 | A2 | - | - | - | 33 | Small monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71311 | Bright reflector | 464688 | 5872253 | A2 | 9.3 | 2.3 | 0 | - | Slightly elongated, irregularly shaped, bright reflector. Other, smaller and less distinct bright reflectors possible nearby. | |
| 71312 | Bright reflector | 464545 | 5872107 | A2 | 3.8 | 3.3 | 0 | - | Irregular bright reflector, possibly a shadow but with no discernible contact, close to dark reflector 71313 . | |
| 71313 | Dark reflector | 464549 | 5872098 | A2 | 7.9 | 1.3 | 0.6 | - | Elongated dark reflector with a broad shadow. Identified in an area of megaripples, 8m from bright reflector 71312 . | |
| 71314 | Magnetic | 471077 | 5871919 | A1 | - | - | - | 896 | Large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71315 | Magnetic | 470861 | 5871493 | A2 | - | - | - | 135 | Medium anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71316 | Magnetic | 470505 | 5871285 | A2 | - | - | - | 269 | Large dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71317 | Dark reflector | 466117 | 5871188 | A2 | 6.1 | 4.8 | 0.6 | - | Poorly defined dark reflector with a slight shadow identified in an area of megaripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71318 | Dark reflector | 466214 | 5871180 | A2 | 11.1 | 6.0 | 0 | - | Distinct dark reflector, with a bright reflector at the front section, identified on the crest of a sandwave. Possibly a natural feature however looks quite distinct. | |
| 71319 | Dark reflector | 466065 | 5871119 | A2 | 4.7 | 0.8 | 0.2 | - | Straight dark reflector identified in an area of megaripples. Feature has a slight shadow. | |
| 71320 | Dark reflector | 464647 | 5871067 | A2 | 5.5 | 2.0 | 0 | - | Small, elongated dark reflector identified in an area of megaripples. Feature possibly has a slight shadow. May be a natural feature. | |
| 71321 | Dark reflector | 464666 | 5871039 | A2 | 6.9 | 1.8 | 0.2 | - | Small, elongated dark reflector identified in an area of megaripples. Feature possibly has a slight shadow. May be a natural feature. | |
| 71322 | Magnetic | 470425 | 5871023 | A2 | - | - | - | 230 | Large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. Located 327 north-west of wreck 71334 . | |
| 71323 | Magnetic | 471157 | 5871003 | A1 | - | - | - | 1320 | Very large positive monopole only identified on one survey line. Indicative of possible substantial buried ferrous debris. Located 450m north-east of wreck 71334 . | |
| 71324 | Seafloor disturbance | 466673 | 5870988 | A2 | 14.6 | 10.3 | 0.5 | - | Patch of seafloor disturbance. Comprised of irregularly shaped dark reflectors, some with slight height. One particularly distinct feature in its centre, measuring 4.9 x 0.9m, with a height of 0.5m. Some bright reflectors identified. Possible linear extending across the sandwaves. Observed in the MBES data as an indistinct rounded mound with a slight surrounding build-up (16 x 14 x 0.7m). | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71325 | Magnetic | 470932 | 5870985 | A1 | - | - | - | 1127 | Very large dipolar anomaly only identified on one survey line. Indicative of possible substantial buried ferrous debris. Located 245m north-east of wreck 71334. | |
| 71326 | Magnetic | 470807 | 5870969 | A2 | - | - | - | 92 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. Located 105m north-east of wreck 71334. | |
| 71327 | Dark reflector | 463349 | 5870964 | A2 | 6.4 | 0.6 | 0.5 | - | Thin rounded edge of an object with corresponding bright shadow. | |
| 71328 | Magnetic | 470473 | 5870947 | A2 | - | - | - | 113 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. Located 255m north-west of wreck 71334. | |
| 71329 | Bright reflector | 464869 | 5870908 | A2 | 4.2 | 1.9 | 0 | - | Small, irregular bright reflector identified in an area of megaripples. Possibly a natural feature however looks quite distinct. | |
| 71330 | Magnetic | 465967 | 5870899 | A2 | - | - | - | 67 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71331 | Dark reflector | 463715 | 5870879 | A2 | 2.9 | 0.6 | 0.2 | - | A linear dark reflector, slightly tapered in the centre and with a bright shadow, located on an uneven sandwave rich area of the seabed. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71332 | Debris | 470686 | 5870865 | A1 | 4.6 | 1.8 | 0.3 | - | A long and thick curvilinear dark reflector with a bright shadow, likely debris and possibly related to nearby wreckage. Feature may be ferrous but any magnetic anomaly here is likely to be masked by the very large anomaly associated with the main area of wreckage 71334 . | |
| 71333 | Debris | 470763 | 5870863 | A1 | 5.3 | 0.4 | 0.1 | - | A long, thin and distinct dark reflector with a dull shadow, located at the edge of the range and may be slightly stretched. Possibly part of the wreckage 71334 however, due to the quality of the data it is difficult to discern whether this is the case. | |
| 71334 | Wreck | 470730 | 5870846 | A1 | 54.0 | 41.2 | 0.6 | 5974 | Large spread of debris comprising mainly linear and curvilinear thin dark reflectors with height, longest is 12m, could be highly broken up or partially buried wreckage. Identified as a very large magnetic anomaly on the magnetometer data, indicating a substantial quantity of ferrous material. Magnetic anomaly is noisy and widely spaced, possible slight positioning error between lines of data, or possible indication of buried material extending beyond the boundaries identified on the sonar data. Identified by UKHO as a non-dangerous wreck, well buried, almost flush with the seabed. Observed in MBES data as irregular mound within an area of sandwaves aligned north-east to south-west, measuring 28 x 18m. | 11190 (UKHO) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71335 | Magnetic | 470880 | 5870838 | A2 | - | - | - | 175 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. Located 135m east from wreck 71334 . | |
| 71336 | Debris | 470736 | 5870812 | A1 | 3.6 | 0.2 | 0.2 | - | A long and very thin discreet dark reflector. Feature has a slight shadow and is located in sandwaves, possibly debris related to wreck 71334 (35m to the north). | |
| 71337 | Dark reflector | 465168 | 5870750 | A2 | 7.0 | 0.8 | 0 | - | Slightly curved dark reflector identified in an area of megaripples. No discernible height. Possibly natural however looks a little more distinct. | |
| 71338 | Magnetic | 470732 | 5870708 | A2 | - | - | - | 92 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. Located 120m east of wreck 71334 . | |
| 71339 | Bright reflector | 466335 | 5870354 | A2 | 8.2 | 2.2 | 0 | - | Series of three, slightly oval bright reflectors in a row. Image possibly distorted by movement of the sonar fish. | |
| 71340 | Magnetic | 471050 | 5869966 | A2 | - | - | - | 57 | Medium dipole anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71341 | Dark reflector | 464209 | 5869963 | A2 | 3.0 | 1.2 | 0.1 | - | A distinct rectangular shaped dark reflector with a bright but short shadow. | |
| 71342 | Dark reflector | 469214 | 5869852 | A2 | 4.0 | 2.3 | 0 | - | A medium sized very distinctive rounded dark reflector with no shadow located within sandwaves. | |
| 71343 | Dark reflector | 464015 | 5869754 | A2 | 8.1 | 0.9 | 0.6 | - | A long, thin and curvilinear dark reflector with a large and bright shadow, located in sandwaves and possibly related to nearby dark reflector feature 71344 . | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71344 | Dark reflector | 464025 | 5869733 | A2 | 5.1 | 1.4 | 0.4 | - | A slightly jagged dark reflector with a shadow, located within sandwaves. The full extent may be covered. Possibly related to nearby dark reflector feature 71343. | |
| 71345 | Dark reflector | 461224 | 5869547 | A2 | 6.6 | 1.0 | 0.2 | - | Small thin object with bright shadow, distorted at one end. | |
| 71346 | Dark reflector | 462783 | 5869346 | A2 | 2.7 | 0.5 | 0.1 | - | A long and thin linear dark reflector with a short shadow, indistinct anomaly. | |
| 71347 | Bright reflector | 463783 | 5869207 | A2 | 9.6 | 4.0 | 0 | - | A large bright reflector anomaly, looks anthropogenic with a fanned profile shape, located within sandwaves. | |
| 71348 | Magnetic | 463241 | 5868689 | A2 | - | - | - | 51 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71349 | Bright reflector | 467825 | 5868655 | A2 | 9.2 | 1.7 | 0 | - | Slightly rectangular bright reflector identified in an area of megaripples. Possibly part of a natural formation however looks relatively distinct. | |
| 71350 | Magnetic | 460521 | 5868531 | A2 | - | - | - | 620 | Large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71351 | Dark reflector | 459422 | 5868511 | A2 | 2.7 | 0.3 | 0.3 | - | An indistinct but long and thin dark reflector with a short but bright shadow, may be associated with nearby dark reflector 71352 and debris field 71353. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71352 | Debris | 459417 | 5868507 | A2 | 4.3 | 3.0 | 0 | 84 | An indistinct dark reflector that may be associated or part of debris field on opposite channel 71353 . An irregular shaped feature that may be buried and with no obvious shadow. Identified approximately 10m east south-east of a magnetic anomaly measuring 8nT, however difficult to discern which feature, if any, it is associated to. | |
| 71353 | Debris field | 459393 | 5868497 | A2 | 25.2 | 12.3 | 0.3 | 84 | Possible debris field, with several small dark reflectors with height, identified on two lines. One large piece of debris, a rounded dark reflector with indistinct curvilinear dark reflectors surrounding it, or possibly partially buried pieces, object has some shadow visible, possibly some associated debris on other channel (71352). Identified approximately 10m south-west of a magnetic anomaly measuring 8nT, however difficult to discern which feature, if any, it is associated with. | |
| 71354 | Dark reflector | 469281 | 5868494 | A2 | 7.8 | 2.5 | 0.6 | - | Poorly defined dark reflector, not particularly distinct, with a broad shadow. Identified in an area of megaripples. Possibly a natural feature. | |
| 71355 | Dark reflector | 464179 | 5868285 | A2 | 10.3 | 6.3 | 0.2 | - | Large dark reflector that appears broken up or partially buried by sands. The feature has a thick and distinct curvilinear edge and smaller dark reflectors within and bright shadows, has some possible scouring orientated east and measuring 6m. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71356 | Magnetic | 470801 | 5868241 | A2 | - | - | - | 586 | Large negative monopole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71357 | Dark reflector | 466335 | 5868205 | A2 | 8.9 | 5.5 | 0 | - | Slightly oval dark reflector with a brighter reflector in the centre. Identified in an area of megaripples, possibly a natural feature. | |
| 71358 | Bright reflector | 464400 | 5868104 | A2 | 5.3 | 4.4 | 0 | - | A distinct bulbous bright reflector with a slight dark reflector outline and a possible bright reflector linear object attached, located within sandwaves. | |
| 71359 | Magnetic | 466645 | 5867823 | A2 | - | - | - | 122 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71360 | Dark reflector | 469581 | 5867798 | A2 | 4.3 | 3.1 | 0.3 | - | Poorly defined dark reflector, possibly with a slight shadow. Some possible disturbance to surrounding sediment. Possibly a natural feature however looks a little anomalous. | |
| 71361 | Debris field | 465600 | 5867662 | A2 | 40.8 | 15.3 | 0.6 | - | A large area of partially buried debris features, a structural looking crossed linear dark reflector is visible in parts with bright shadows and smaller possible associated debris in the sands surrounding the feature. Not visible in the bathymetry data. | |
| 71362 | Debris | 465576 | 5867598 | A2 | 20.1 | 0.9 | 0.2 | - | A very long and thin slightly curvilinear shaped dark reflector with a bright, short shadow, located in sandwaves and may be partially buried debris. | |
| 71363 | Bright reflector | 468278 | 5867476 | A2 | 12.3 | 6.0 | 0 | - | Elongated bright reflector, appears to be an 'x' shape. Not particularly distinct. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71364 | Dark reflector | 467225 | 5867314 | A2 | 5.8 | 0.8 | 0.4 | - | Elongated dark reflector with slight height. Not particularly distinct. Identified in an area of megaripples, possibly a natural feature. | |
| 71365 | Dark reflector | 459025 | 5867120 | A2 | 3.0 | 0.7 | 0.4 | - | A distinct crescent shaped dark reflector with a bright shadow, located within sandwaves, isolated feature. | |
| 71366 | Dark reflector | 468502 | 5867011 | A2 | 5.0 | 2.8 | 0.6 | - | Poorly defined dark reflector with an irregular shadow. Feature identified towards the limit of the data therefore hard to discern. | |
| 71367 | Rope/chain | 465416 | 5867008 | A2 | 12.7 | 0.6 | 0.1 | - | A partially buried or broken up thin linear dark reflector with a shadow located within sandwaves. Quite distinct possible rope or chain. | |
| 71368 | Dark reflector | 469839 | 5866908 | A2 | 7.7 | 1.6 | 0.6 | - | Poorly defined, elongated dark reflector with a very slight shadow. Identified in an area of megaripples. | |
| 71369 | Dark reflector | 464095 | 5866854 | A2 | 4.5 | 0.7 | 0.1 | - | A long and thick linear dark reflector with a short and bright shadow, distinct anomaly within large sandwaves. | |
| 71370 | Dark reflector | 466587 | 5866795 | A2 | 2.7 | 0.5 | 0.2 | - | A distinct and slightly curvilinear dark reflector with a bright shadow, located within sandwaves. | |
| 71371 | Magnetic | 469685 | 5866793 | A2 | - | - | - | 218 | Large positive monopole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71372 | Dark reflector | 470665 | 5866788 | A2 | 5.8 | 1.2 | 0 | - | A large and slightly oval shaped distinct dark reflector with no shadow, distinct anomaly within sandwaves. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71373 | Seafloor disturbance | 462025 | 5866580 | A2 | 20.5 | 11.1 | 0 | - | Small patch of disturbed seafloor comprised several dark reflectors. Not particularly distinct however looks a little anomalous. Observed in the MBES data as a small irregular mound within area of sandwaves (18 x 17 x 1.1m). | |
| 71374 | Debris | 463190 | 5866253 | A2 | 16.2 | 0.8 | 0 | - | Straight, linear dark reflector identified in an area of megaripples. Not particularly distinct, possibly a natural feature however appears to be perpendicular to the natural orientation of the ripples. | |
| 71375 | Debris | 457509 | 5866051 | A2 | 7.4 | 1.6 | 0.2 | - | An indistinct possible large piece of debris, a cross shaped dark reflector with shadows in parts, located on the edge of sandwaves. | |
| 71376 | Dark reflector | 466574 | 5865877 | A2 | 2.8 | 0.2 | 0.2 | - | An indistinct linear dark reflector with a bright shadow, situated on a sandwave and may be partially buried. | |
| 71377 | Recorded Obstruction | 467513 | 5865872 | A3 | - | - | - | - | UKHO have a record of an area of foul ground however nothing anthropogenic was identified on the geophysical data. | 11236 (UKHO) |
| 71378 | Seafloor Disturbance | 454526 | 5865807 | A2 | 10.9 | 10.6 | 0 | - | An anomalous area of small bright and dark reflectors. Has a rather speckled appearance. In area of rippled seabed. | |
| 71379 | Dark reflector | 469084 | 5865720 | A2 | 6.9 | 0.2 | 0.1 | - | Straight, narrow dark reflector with a slight shadow. Not particularly distinct. | |
| 71380 | Dark reflector | 462262 | 5865503 | A2 | 6.9 | 2.6 | 0.6 | - | Elongated, irregularly shaped dark reflector with a slight shadow. Possibly a natural feature or item of debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71381 | Magnetic | 456149 | 5865143 | A2 | - | - | - | 62 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71382 | Dark reflector | 464999 | 5865023 | A2 | 7.9 | 0.8 | 0.5 | - | A long and thick linear dark reflector with a large and bright shadow, looks anthropogenic within large sandwaves. | |
| 71383 | Debris | 462861 | 5864962 | A2 | 4.1 | 3.2 | 2.2 | - | Small oval patch of disturbed seafloor around a distinct, angular dark reflector with height in its centre (disturbed seabed measures 20.4 x 7.4m). UKHO describes feature as a low mound, possibly a wellhead however with no associated magnetic anomaly. Observed in the MBES data as a small sub-rounded object (7 x 6 x 1.7m) within a slight depression with some scour to the north-west. No charted wellheads or pipelines here. | 11235 (UKHO) |
| 71384 | Dark reflector | 467186 | 5864794 | A2 | 5.2 | 0.2 | 0.1 | - | A long and thin distinct linear dark reflector with a bright shadow located within sandwaves. | |
| 71385 | Dark reflector | 458836 | 5864552 | A2 | 4.7 | 2.8 | 0 | - | A large, distinct and isolated rectangular shaped dark reflector with no shadow, looks anomalous to the surrounding seabed. | |
| 71386 | Dark reflector | 456581 | 5864541 | A2 | 7.7 | 1.7 | 0.6 | - | Indistinct feature with a clear and bright shadow. Located on a rippled seabed. | |
| 71387 | Dark reflector | 467740 | 5864536 | A2 | 4.8 | 2.2 | 0 | - | A large and distinct oval shaped dark reflector with no shadow, located on the edge of a sandwave. Isolated feature. | |
| 71388 | Magnetic | 459359 | 5864415 | A2 | - | - | - | 34 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71389 | Dark reflector | 459434 | 5864415 | A2 | 2.3 | 0.5 | 0 | - | A linear dark reflector with no shadow, located within sandwaves, isolated and distinct feature. | |
| 71390 | Dark reflector | 462250 | 5863977 | A2 | 11.3 | 0.7 | 0.2 | - | A very long and thin linear dark reflector with a slight shadow visible, lying within sandwaves this looks anthropogenic rather than part of them. | |
| 71391 | Bright reflector | 463556 | 5863945 | A2 | 8.8 | 1.5 | 0 | - | Elongated bright reflector identified in an area of megaripples. Possibly part of a natural feature however looks quite distinct. | |
| 71392 | Bright reflector | 470190 | 5863857 | A2 | 4.6 | 3.2 | 0 | - | 'L' shaped bright reflector, close to other, similar bright reflectors. Possibly part of a natural feature. | |
| 71393 | Dark reflector | 463009 | 5863847 | A2 | 13.9 | 0.8 | 0 | - | Short, slightly bent linear dark reflector. No discernible height. Possibly natural however looks slightly more distinct. | |
| 71394 | Dark reflector | 460449 | 5863844 | A2 | 7.8 | 2.1 | 0.3 | - | Three rounded small dark reflectors aligned with a shadow with a thick linear (5.2m length) dark reflector with no shadow attached to this. | |
| 71395 | Seafloor disturbance | 458042 | 5863627 | A2 | 17.6 | 4.1 | 0.9 | - | A large feature with a very distinct and large area of shadows. The dark reflectors are vaguely visible as thin curvilinear features, there is a main piece with two linears coming off, one bright reflector and one thin dark reflector with a shadow. | |
| 71396 | Dark reflector | 455890 | 5863588 | A2 | 10.5 | 1.5 | 0.4 | - | Elliptical object which appears across sand ripples. Some slight varying bright shadow. | |
| 71397 | Dark reflector | 469886 | 5863181 | A2 | 3.1 | 1.5 | 0.5 | - | Small rounded dark reflector with a broad, irregular shadow. Feature is not particularly distinct. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71398 | Rope/chain | 470616 | 5862905 | A2 | 44.4 | 0.7 | 0 | - | Curvilinear dark reflector, with a bright reflector at the front in the central section. Feature not always particularly distinct. Possible rope or chain. | |
| 71399 | Magnetic | 461333 | 5862863 | A2 | - | - | - | 87 | Distinct medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71400 | Debris | 466420 | 5862227 | A2 | 10.1 | 2.4 | 0.4 | - | A large possible piece of debris, a rounded and hollow dark reflector with a linear piece attached to this, has a bright reflector shadow and possibly in a depression. Located within sandwaves. | |
| 71401 | Magnetic | 463131 | 5862213 | A2 | - | - | - | 480 | Large asymmetric dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71402 | Dark reflector | 465775 | 5862092 | A2 | 7.1 | 0.4 | 0.1 | - | Small, slightly curved elongated dark reflector with a slight shadow. | |
| 71403 | Magnetic | 463049 | 5862063 | A2 | - | - | - | 44 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71404 | Dark reflector | 465137 | 5862030 | A2 | 15.0 | 1.5 | 0.6 | - | Slightly wavy linear dark reflector with a broad shadow. Identified in an area of megaripples. | |
| 71405 | Debris field | 465303 | 5861937 | A2 | 23.7 | 16.9 | 0.5 | - | Small patch of possible debris features comprising several dark reflectors of different shapes with height. Identified in an area of megaripples. | |
| 71406 | Magnetic | 462347 | 5861921 | A2 | - | - | - | 58 | Medium distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71407 | Dark reflector | 470782 | 5861681 | A2 | 3.8 | 2.3 | 0.5 | - | Poorly defined dark reflector with a relatively distinct, irregular shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71408 | Dark reflector | 469247 | 5861598 | A2 | 5.8 | 2.8 | 0.5 | - | An indistinct large dark reflector with a shadow in parts, appears broken up or partially buried by sands, appears to have a rounded dark reflector with smaller anomalies joined to this. | |
| 71409 | Seafloor disturbance | 459980 | 5861546 | A2 | 22.0 | 10.2 | 0.6 | - | Discrete area of small dark reflectors of varying shapes with varying height shadows. | |
| 71410 | Dark reflector | 456808 | 5861509 | A2 | 4.2 | 0.3 | 0.1 | - | Distinct linear object with height in area of irregular seabed. | |
| 71411 | Dark reflector | 458062 | 5861390 | A2 | 2.6 | 0.9 | 0.3 | - | Rather indistinct feature with height and scour. | |
| 71412 | Debris field | 462554 | 5861336 | A2 | 22.2 | 9.8 | 0.5 | 26 | Large spread of possible debris located within sandwaves, approximately 9 dark reflectors of various shapes and sizes, the largest measures 3.8 x 2m. The full extent of this debris may be buried by sands. Identified on the magnetic data as a small dipole indicating some ferrous material. | |
| 71413 | Dark reflector | 470441 | 5861228 | A2 | 4.7 | 1.0 | 0.2 | - | Poorly defined straight, elongated dark reflector with a very faint shadow. Identified in an area of megaipples. | |
| 71414 | Dark reflector | 459229 | 5860911 | A2 | 31.2 | 0.8 | 0 | - | A long, thin and slightly curvilinear dark reflector with no shadow. At far extent of data. | |
| 71415 | Magnetic | 457611 | 5860895 | A2 | - | - | - | 107 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71416 | Seafloor disturbance | 458624 | 5860621 | A2 | 11.6 | 10.5 | 0.4 | - | Sub-rounded area of dark and bright reflectors. Appears indistinct with corresponding rounded bright shadow. | |
| 71417 | Dark reflector | 465118 | 5860542 | A2 | 4.8 | 1.6 | 0 | - | Elongated dark reflector, poorly defined. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71418 | Debris field | 463437 | 5860495 | A2 | 40.1 | 8.2 | 0.3 | - | A group of parallel curvilinear dark reflectors with bright shadows in a triangular alignment, approximately six at the widest point though very indistinct, possibly buried by sandwaves. | |
| 71419 | Dark reflector | 456525 | 5860463 | A2 | 4.9 | 0.8 | 0.4 | - | Small linear item with height near 71420. In an area of sandwaves. | |
| 71420 | Dark reflector | 456530 | 5860457 | A2 | 4.8 | 0.5 | 0.6 | - | Rather indistinct small linear feature with height in area of small sandwaves, close to dark reflector 71419 | |
| 71421 | Debris field | 463311 | 5859642 | A2 | 17.5 | 6.2 | 0.3 | - | Large spread of possible debris, including an irregular oval shaped dark reflector hollow anomaly. Features don't look joined up so may be partially buried by sands, some have shadows and some not. Looks to be situated in an area of disturbed seabed. | |
| 71422 | Dark reflector | 463323 | 5859580 | A2 | 3.5 | 1.8 | 0.2 | - | A medium sized dark reflector with a small shadow that does not appear to be solid, may be slightly buried by sands or broken up. | |
| 71423 | Dark reflector | 457700 | 5859220 | A2 | 6.6 | 0.6 | 0 | - | A thin curvilinear dark reflector feature, isolated object. | |
| 71424 | Dark reflector | 467511 | 5859031 | A2 | 10.2 | 3.1 | 0.6 | - | Slightly rectangular dark reflector with a bright reflector in the centre and a broad shadow. Identified in an area of megaripples. | |
| 71425 | Debris | 463547 | 5859014 | A2 | 5.7 | 0.7 | 0.3 | - | A distinct long and thin linear dark reflector with a dull shadow, distinct feature lying perpendicular to the sandwaves. | |
| 71426 | Debris | 458485 | 5858743 | A2 | 5.4 | 0.7 | 0.2 | - | Distinct linear dark reflector with height. Possibly slightly stretched data here. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71427 | Seafloor disturbance | 459917 | 5858607 | A2 | 21.1 | 8.0 | 0 | - | Oval shaped area of disturbed seabed. Possibly contains some debris. | |
| 71428 | Debris field | 459669 | 5858243 | A2 | 41.7 | 9.6 | 0.7 | - | A large debris field. Contains mostly linear debris. In area of rippled seabed. Some bright reflectors. | |
| 71429 | Dark reflector | 467349 | 5858041 | A2 | 6.4 | 1.0 | 0.4 | - | Elongated dark reflector, bent round in a slight 'v' shape, with a distinct shadow. Identified in an area of megaripples. | |
| 71430 | Dark reflector | 463366 | 5857745 | A2 | 4.9 | 0.6 | 0.4 | - | A long thin and slightly curvilinear dark reflector with a bright shadow, located at the edge of a sandwave. | |
| 71431 | Dark reflector | 459404 | 5857717 | A2 | 5.1 | 0.8 | 0 | - | Two small dark reflectors situated next to each other. | |
| 71432 | Dark reflector | 468081 | 5857433 | A2 | 3.8 | 1.5 | 0.5 | - | Small round dark reflector with a bright reflector in its centre. Feature appears to extend out. Contact has a distinct, relatively broad shadow, identified in an area of megaripples. | |
| 71433 | Debris field | 463740 | 5857305 | A2 | 12.6 | 3.1 | 0.3 | - | A large spread of small dark reflectors, some with shadows, close together within sandwaves, possible debris field. | |
| 71434 | Seafloor Disturbance | 460065 | 5857241 | A2 | 7.1 | 2.8 | 0 | - | Depression or scour containing possible debris. Bright reflector on the near side, backed by a dark reflector. | |
| 71435 | Magnetic | 469435 | 5857207 | A2 | - | - | - | 120 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71436 | Dark reflector | 458818 | 5857042 | A2 | 5.4 | 1.2 | 0 | - | Rather indistinct elongate feature. Possible scouring around one end. In area of rippled seabed. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71437 | Seafloor disturbance | 459385 | 5856973 | A2 | 20.5 | 10.2 | 0 | - | Irregularly shaped area of bright and dark reflectors. Appears situated at one end of a patch of coarser sediment. Possibly contains debris. | |
| 71438 | Dark reflector | 462846 | 5856794 | A2 | 3.8 | 0.5 | 0.2 | - | A very distinct thick linear dark reflector with a bright shadow lying perpendicular to the sandwaves. | |
| 71439 | Bright reflector | 464942 | 5856502 | A2 | 4.3 | 0.2 | 0 | - | Small straight thin object with no obvious dark reflector or shadow. | |
| 71440 | Dark reflector | 459416 | 5856382 | A2 | 4.2 | 0.3 | 0.2 | - | Small and thin linear feature with height. Possible debris. Isolated object on rippled seabed. | |
| 71441 | Bright reflector | 460814 | 5856368 | A2 | 6.5 | 1.0 | 0 | - | Linear bright reflector feature with no apparent object in front. Seabed is irregular with ripples and shadows nearby but this one looks anomalous. | |
| 71442 | Dark reflector | 470099 | 5856157 | A2 | 5.5 | 0.7 | 0.3 | - | An indistinct linear dark reflector with a large pointed shadow, located within sandwaves. | |
| 71443 | Magnetic | 469821 | 5856125 | A2 | - | - | - | 51 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71444 | Seafloor Disturbance | 461437 | 5855625 | A2 | 28.5 | 18.2 | 0 | - | Possible area of seafloor disturbance, may just be a localised area of irregular seabed but it is anomalous here. Consists of many small bright reflectors and some dark reflectors. | |
| 71445 | Magnetic | 462945 | 5855147 | A2 | - | - | - | 177 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71446 | Dark reflector | 463880 | 5855077 | A2 | 4.4 | 0.4 | 0.2 | - | A long, thin and distinct linear dark reflector with a bright shadow, lying perpendicular to sandwaves. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71447 | Seafloor disturbance | 467803 | 5854603 | A2 | 20.2 | 5.9 | 0.3 | - | Elliptical area of dark and small reflectors. Seems off the angle of sandwaves. | |
| 71448 | Dark reflector | 460687 | 5854541 | A2 | 3.4 | 0.6 | 0.2 | - | Linear feature with possible height located on an uneven area of the seabed and 6m from 71449. | |
| 71449 | Dark reflector | 460690 | 5854535 | A2 | 4.5 | 0.8 | 0.3 | - | An elongate object with height, located 6m from 71448. | |
| 71450 | Bright reflector | 460711 | 5854518 | A2 | 3.7 | 1.0 | 0 | - | An elongate bright reflector feature with no obvious object in front. | |
| 71451 | Dark reflector | 469491 | 5854489 | A2 | 3.6 | 2.0 | 0.6 | - | Dark reflector with a relatively broad shadow. | |
| 71452 | Debris | 464769 | 5854398 | A2 | 11.9 | 4.5 | 0.9 | - | A large piece of possible debris, an irregular triangle shaped dark reflector with a bright, pointed shadow, isolated object within sandwaves, has some slight scouring orientated north and measuring 9m. Observed in the MBES data as a small sub-rounded object within a slight depression to the south-west of a possible cable. | |
| 71453 | Debris field | 463732 | 5854346 | A2 | 33.5 | 17.1 | 0.3 | 239 | A large scatter of potential debris, approximately 10 dark reflector anomalies, some with shadows, rounded, linear and square objects visible within an area of sandwaves and further anomalies may be buried. The largest is 4.1 x 2.5m. Has a large magnetic anomaly associated indicating ferrous debris. Observed as an irregular mound (26 x 10 x 0.5m) in the MBES data. | |
| 71454 | Dark reflector | 460370 | 5854342 | A2 | 3.4 | 1.0 | 0.5 | - | An elongate dark reflector with variable height indicated by shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71455 | Debris | 463706 | 5854335 | A2 | 1.7 | 0.5 | 1.1 | 239 | Possible piece of debris, very thin and long dark reflector with a bright distinct shadow, located 27m south-west from possible debris field 71453 and may be related. Has a large magnetic anomaly associated indicating ferrous debris. Observed as a small round mound in the MBES data measuring 3 x 3 x 0.2m. | |
| 71456 | Debris | 463481 | 5853862 | A2 | 2.9 | 1.3 | 0.4 | 38 | A rectangular shaped dark reflector with a bright and tapered shadow, isolated and distinct feature on a sandwave rich area of the seabed. Has a small magnetic anomaly associated indicating ferrous debris. | |
| 71457 | Magnetic | 463503 | 5853825 | A2 | - | - | - | 43 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71458 | Mound | 465194 | 5853745 | A2 | 21.3 | 7.0 | 0.5 | - | A large object visible as a slightly curvilinear dark reflector that is wider but more indistinct at one end than the other with a large dull shadow. Observed in the MBES data as a long tapering mound of sloping height, aligned north-west to south-east, within sandwaves but on a different alignment. | |
| 71459 | Dark reflector | 465987 | 5853739 | A2 | 3.0 | 0.7 | 0.2 | - | A distinct dark reflector, appears as a rounded dark reflector with a shadow and a very thin linear dark reflector attached to this, located in sandwaves and isolated. | |
| 71460 | Magnetic | 465955 | 5853643 | A2 | - | - | - | 220 | Large dipole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71461 | Magnetic | 462057 | 5853581 | A2 | - | - | - | 91 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71462 | Debris | 461860 | 5853426 | A2 | 6.7 | 0.7 | 0.2 | - | Curvilinear object with height in area of rippled seabed. | |
| 71463 | Seafloor disturbance | 470959 | 5853148 | A2 | 14.4 | 8.3 | 0 | - | Medium sized, mottled patch of disturbed seafloor identified in an area of megaripples. Possibly a natural feature however looks a little anomalous. | |
| 71464 | Seafloor disturbance | 470963 | 5853127 | A2 | 20.5 | 7.3 | 1.1 | - | Large and slightly oval shaped area of disturbed seafloor identified in an area of megaripples. Possibly a natural feature however looks anomalous to the surrounding seabed. | |
| 71465 | Debris | 464915 | 5852959 | A2 | 5.2 | 0.8 | 0.3 | - | A linear alignment of four possible objects close together, only has a shadow at one end of the feature and possibly in a slight depression within an area of sandwaves, possible debris. | |
| 71466 | Dark reflector | 470286 | 5852755 | A2 | 5.5 | 5.2 | 0.4 | - | Angular bent object with slight shadow. Follows sand ripples so could be part of natural feature but looks anomalous. | |
| 71467 | Dark reflector | 470245 | 5852729 | A2 | 9.4 | 6.1 | 0.4 | - | Sub rounded object which looks dappled and some rounded bright reflector. | |
| 71468 | Dark reflector | 470244 | 5852718 | A2 | 3.4 | 2.5 | 0.3 | - | Small angular object with corresponding bright shadow. | |
| 71469 | Debris | 462289 | 5852648 | A2 | 12.5 | 2.8 | 0 | - | A curvilinear feature with no height and possible scouring around it. Located within sandwaves. | |
| 71470 | Dark reflector | 462472 | 5852549 | A2 | 4.4 | 0.4 | 0.3 | - | Long and thin linear object with height, possibly associated with nearby debris field 71471 . | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71471 | Debris field | 462479 | 5852515 | A2 | 15.7 | 9.0 | 2.4 | - | Area containing several objects with height. Some linear and some more blocky. Identified by UKHO as a possible cable with anchor attached. Observed in the MBES data as a small sub-rounded mound within a possible larger seafloor disturbance. The nearest magnetic survey line is located 47m away and this may explain why, if it is an anchor, there is no magnetic anomaly associated with this feature. | 11246 (UKHO) |
| 71472 | Debris field | 461988 | 5852355 | A2 | 11.8 | 7.8 | 0 | - | Medium sized area containing dark reflectors, some of which are linear. Bright reflectors indicate height or scouring. | |
| 71473 | Dark reflector | 470419 | 5852141 | A2 | 2.5 | 1.7 | 0.9 | - | Irregular dark reflector with a distinct shadow and some possible associated scour. | |
| 71474 | Dark reflector | 470335 | 5852008 | A2 | 7.5 | 2.4 | 0.6 | - | Irregular object, possibly in stretched data, with some bright angular shadow. | |
| 71475 | Debris field | 466763 | 5851999 | A2 | 6.8 | 4.3 | 0.3 | - | An irregular shaped dark reflector with shadows in parts, large object that appears to be broken up or partially buried by sediment, appears to be two crossed linear features and some small, rounded dark reflectors. | |
| 71476 | Magnetic | 470359 | 5851917 | A2 | - | - | - | 52 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71477 | Debris | 469565 | 5851813 | A2 | 5.5 | 2.0 | 0.5 | - | Dark reflector identified within sandwaves, a very distinct curvilinear thick dark reflector with a bright shadow and possibly in a slight depression. Possible non-ferrous item of debris. | |
| 71478 | Debris field | 467849 | 5851714 | A2 | 11.5 | 10.7 | 1.2 | - | Large spread of possible debris located within large sandwaves and possibly partially buried. Small but distinct dark reflectors with shadows, largest is 1.5 x 0.7m. Observed in the MBES data as an indistinct mound with an apex (50 x 20 x 1m) aligned north-east to south-west. | |
| 71479 | Magnetic | 464147 | 5851155 | A1 | - | - | - | 4455 | Very large dipole identified on more than one survey line. Indicative of possible substantial buried ferrous debris. | |



12.8 Appendix VIII: Seabed Anomalies of Archaeological Potential in the provisional Offshore Cable Corridor

Co-ordinates are in ETRS89 UTM Zone 31N.

| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70317 | Debris | 483654 | 5850867 | A2 | 6.0 | 1.3 | 0.6 | - | Observed in 2012 OFTO data. Weakly contrasting and diffuse narrow rectangular anomaly in depression, possibly piece of debris. Associated multibeam bathymetry beam showing slight mound amongst sandwaves but no associated magnetic contact. Not observed in the most recent 2016 dataset and may have since been buried | |
| 70318 | Seafloor disturbance | 483569 | 5847632 | A2 | 9.2 | 4.0 | 0.7 | - | Observed in 2012 OFTO data. Weak, larger diffuse irregular shaped anomaly with height, possibly natural but larger in size than other natural features in area. Distinct depression with mound to the south visible on the multibeam bathymetry. Located approximately 25m north of 70319 . No associated magnetic contact. Not observed in the most recent 2016 dataset and may have since been buried. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70319 | Mound | 483557 | 5847594 | A2 | 9.0 | 7.0 | 0.6 | - | Observed originally in 2012 OFTO data. Weak, larger diffuse irregular shaped anomaly with height, possibly natural but larger in size than other natural features in area. Distinct mound on quiet seafloor with two adjacent depressions separated by central barrier orientated north - south. Larger depression is located to the west of the mound. Located approx. 25m south of 70318 . No associated magnetic contact. In the 2016 bathymetry data this is visible as a small mound within natural features/possible dredging scars. | |
| 70320 | Debris | 483355 | 5847396 | A2 | 8.0 | 6.0 | 0.3 | - | Observed originally in 2012 OFTO data. Diffuse, large curvilinear anomaly, appears partially buried and with scour, possibly piece of debris. A distinct depression is visible on the multibeam bathymetry. No associated magnetic contact. In the 2016 bathymetry data this is visible as a large object within a depression, slightly rounded shaped feature, has scouring orientated north measuring 25 m. The depression measures 8 m x 6 m | |
| 70321 | Dark reflector | 483255 | 5848355 | A2 | 8.2 | 1.7 | 0 | - | A large dark reflector with no shadow, distinct and irregular shaped anomaly | |
| 70322 | Debris field | 483134 | 5848791 | A2 | 38.3 | 6.0 | 0.2 | - | A very large oval shaped area of possible debris. Indistinct group of bright and dark reflectors that appear to be partially buried by sands. It has a long rope or chain coming off the feature orientated to the north. Not visible in bathymetry data. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70323 | Debris | 483073 | 5848816 | A2 | 6.5 | 2.1 | 0.2 | - | Observed in 2012 OFTO data. Approximately oval shaped anomaly with three short linear dark reflectors on the outer edge with an inner area of curvilinear bright reflector, possibly non-ferrous piece of debris as there is no associated magnetic contact. Not observed in the most recent 2016 dataset and may have since been buried | |
| 70324 | Magnetic | 483028 | 5855129 | A2 | - | - | - | 27 | Observed in 2012 OFTO data. Small distinct anomaly located amongst sandwaves. No associated multibeam bathymetry or side scan sonar contact. Not observed in the most recent 2016 dataset however retained given magnetometer line spacing. | |
| 70325 | Magnetic | 482987 | 5849995 | A2 | - | - | - | 39 | Small anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70326 | Magnetic | 482932 | 5851879 | A2 | - | - | - | 157 | Observed in 2012 OFTO data. Medium sized distinct negative anomaly located amongst sandwaves. No associated multibeam bathymetry or side scan sonar contact. Not observed in the most recent 2016 dataset however retained given magnetometer line spacing. | |
| 70327 | Dark Reflector | 482777 | 5846618 | A2 | 7.2 | 2.3 | 0 | - | Observed in 2012 OFTO data. Weak, partially buried oval shaped anomaly. No associated magnetic contact. Not observed in the most recent 2016 dataset and may have since been buried | |
| 70328 | Dark reflector | 482605 | 5852302 | A2 | 4.2 | 0.4 | 0.2 | - | A long and thin distinct dark reflector with a dull tapered shadow, located on an area of sandwaves | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70329 | Debris | 482491 | 5849286 | A2 | 2.5 | 1.4 | 0 | - | A triangular shaped bright reflector, located in an area of sandwaves small and very distinct anomaly, possibly debris | |
| 70330 | Magnetic | 482393 | 5851869 | A2 | - | - | - | 33 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70331 | Bright reflector | 482374 | 5848830 | A2 | 7.2 | 1.9 | 0 | - | Large oval shaped bright reflector, distinct anomaly. | |
| 70332 | Bright reflector | 482368 | 5849369 | A2 | 5.6 | 1.1 | 0 | - | Slightly tapered linear shaped bright reflector, possibly part of sandwaves though looks to be quite isolated from them. | |
| 70333 | Magnetic | 482302 | 5849420 | A2 | - | - | - | 62 | Observed in 2012 OFTO data. Distinct dipole anomaly located amongst sandwaves. No associated multibeam bathymetry or side scan sonar contact. Not observed in the most recent 2016 dataset however retained given magnetometer line spacing. | |
| 70334 | Dark reflector | 482146 | 5850322 | A2 | 7.8 | 2.0 | 0.7 | - | One or possibly two dark reflectors directly next to one another with very bright shadows. Very distinctive anomaly located within sandwaves. | |
| 70335 | Debris field | 482142 | 5850334 | A2 | 8.6 | 5.5 | 0.3 | - | A medium sized possible debris field located within sandwaves. The anomaly comprises indistinct dark reflectors with bright shadows, located on the crest of a sandwave. Possible area of gravel | |
| 70336 | Debris field | 482107 | 5848737 | A2 | 9.1 | 4.1 | 0.2 | - | A possible area of debris or perhaps partially buried debris. A half butterfly shaped dark reflector with bright shadows situated in a depression. The full extent is possibly buried, may just be natural | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70337 | Magnetic | 481997 | 5848895 | A2 | - | - | - | 41 | Observed in 2012 OFTO data. Distinct dipole anomaly located amongst sandwaves. No associated multibeam bathymetry or side scan sonar contact. Not observed in the most recent 2016 dataset however retained given magnetometer line spacing. | |
| 70338 | Magnetic | 481631 | 5849897 | A2 | - | - | - | 29 | Observed in 2012 OFTO data. A broad irregular magnetic anomaly. No associated multibeam bathymetry or side scan sonar contact. Not observed in the most recent 2016 dataset however retained given magnetometer line spacing. | |
| 70339 | Magnetic | 480753 | 5849174 | A2 | - | - | - | 52 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70340 | Mound | 480053 | 5849399 | A2 | 4.2 | 3.8 | 0.7 | - | A large oval shaped hollow dark reflector with a large but dull shadow, located in sandwaves and the full extent may be hidden, there is some scouring visible. Identified in the bathymetry data as a small but distinct mound | |
| 70341 | Dark reflector | 477907 | 5849684 | A2 | 7.3 | 0.8 | 0 | - | A long, thin and curvilinear dark reflector with no shadow. Looks slightly more anthropogenic than part of a sandwave | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70342 | Wreck | 477521 | 5849048 | A1 | 33.0 | 14.0 | 1.0 | 50 | Very indistinct area of wreckage. An oval shaped area of bright and dark reflectors, some with shadows and some without, lying perpendicular to sandwaves. There is very little detail visible to identify this as a wreck. In the bathymetry data a long and thick linear mound is visible, lying slightly perpendicular to the large sandwaves and may be masked by sediment, it is aligned north-east to south-west and has faint scouring orientated north and measuring 50m. Has a medium magnetic anomaly associated, though nearest mag line is 27m away. Associated with UKHO record (11091) of Golden Oriole (possibly), a British trawler Sunk 22/01/1915. Previously observed in 2014 as well broken-up with dimensions of 26m x 8.3m x 1.4m. | 11091 (UKHO) |
| 70343 | Magnetic | 477288 | 5849286 | A2 | - | - | - | 28 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70344 | Debris field | 477130 | 5848283 | A2 | 5.4 | 0.8 | 0.2 | - | Three small dark reflectors with shadow located on the edge of a sandwave, largest measures 1.9 m x 0.7 m. Possibly rocks though not many seen in this area of the seabed. | |
| 70345 | Dark reflector | 474764 | 5848339 | A2 | 8.6 | 0.5 | 0.2 | - | A very long and thin linear dark reflector with a bright shadow, feature looks slightly disjointed. Located within sandwaves and full extent may be partially buried | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70346 | Debris field | 473868 | 5847907 | A2 | 11.7 | 0.8 | 0.4 | - | A spread of possible debris comprising three very thin linear dark reflectors with shadows, possibly broken up single piece of debris, full extent may be buried by fine sediments | |
| 70347 | Debris | 473461 | 5847936 | A2 | 4.3 | 0.9 | 0 | - | Medium sized rectangular shaped bright reflector located in between sandwaves, distinctive possible debris feature. | |
| 70348 | Debris field | 472271 | 5848199 | A2 | 11.0 | 3.7 | 0.5 | - | Possible debris field comprising 5+ medium sized dark reflectors with shadows. Curvilinear and linear features, the largest measures 0.4 m x 3.3 m. Located in sandwaves and full extent may be buried. Not visible in bathymetry data. | |
| 70349 | Magnetic | 472004 | 5849266 | A2 | - | - | - | 42 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70350 | Bright reflector | 471930 | 5848358 | A2 | 7.3 | 3.1 | 0 | - | A large half circular shaped bright reflector, located on the edge of a sandwave and may be part of it, though looks larger and more distinctive than surrounding seabed. | |
| 70351 | Magnetic | 471821 | 5849407 | A2 | - | - | - | 22 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70352 | Magnetic | 471771 | 5848989 | A2 | - | - | - | 36 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70353 | Dark reflector | 471589 | 5847886 | A2 | 2.1 | 0.7 | 2.1 | - | A small/medium sized rectangular shaped dark reflector with a large, bright and bulbous shadow, very similar to 70354 which is 5 m away | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70354 | Dark reflector | 471584 | 5847884 | A2 | 1.4 | 0.7 | 2.1 | - | A small rectangular shaped dark reflector with a very long, thin and bright shadow, located within sandwaves, very similar to 70353 which is 5 m away | |
| 70355 | Debris | 471567 | 5847880 | A2 | 7.1 | 1.5 | 1.9 | - | A long and thick linear dark reflector with a large shadow, very distinctive feature in an area of sandwaves, possible debris | |
| 70356 | Bright reflector | 471561 | 5850060 | A2 | 8.7 | 1.8 | 0 | - | A large and distinctive bright reflector, appears as two semi-circles aligned, looks highly anthropogenic. | |
| 70357 | Debris | 470982 | 5848241 | A2 | 8.9 | 0.5 | 0 | - | A long and thick linear bright reflector anomaly, looks too straight to be a sandwave, possible debris. | |
| 70358 | Dark reflector | 469971 | 5847765 | A2 | 3.0 | 0.4 | 0 | - | A thin and distinct dark reflector with no shadow, located on the edge of a sandwave. | |
| 70359 | Magnetic | 467009 | 5847525 | A2 | - | - | - | 15 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70360 | Wreck | 466386 | 5846784 | A1 | 54.0 | 11.0 | 4.0 | 15867 | An area of wreck debris consisting of a large spread of linear, curvilinear and smaller dark reflectors with shadows located within sandwaves. The full extent of the wreck may be buried. The largest piece measures 5.8m x 1.4m. The wreck is relatively broken up and in poor condition. Large amount of scour visible. Not seen in full in sidescan data as towfish went over the top and not good quality data. In the bathymetry data the wreck is aligned north-east to south-west, it possibly has some debris or broken structure situated directly to the north-east end of the vessel (70361). The wreck stands upright prominently within large sandwaves and has a large amount of scouring orientated north to south and measuring over 300m visible. Very high magnetic anomaly associated. Some possible debris associated. Associated with UKHO record (11093) of HMS <i>Dunoon</i> (possibly), a British minesweeper with original dimensions 70.4m x 8.5m x 2.1m. Sunk by a mine on 30/05/1940. Last observed as relatively intact but damaged in the bows with a length of 62m and a recorded height of 5.2m. | 11093 (UKHO) |
| 70361 | Debris | 466368 | 5846827 | A2 | 6.4 | 1.9 | 0.2 | - | A thick linear dark reflector with a shadow on a rough and uneven area of the seabed. Large piece of possible debris associated with wreck 70360 situated 47 m to the south-east. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70362 | Magnetic | 465809 | 5847281 | A2 | - | - | - | 52 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70363 | Magnetic | 465267 | 5847174 | A2 | - | - | - | 14 | Small anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70364 | Magnetic | 464769 | 5846759 | A2 | - | - | - | 6 | Small but distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70365 | Debris | 464150 | 5846800 | A2 | 8.7 | 3.6 | 1.2 | - | A large piece of possible debris, very solid and distinct dark reflector with a short but bright shadow, has some scour associated orientated north and measuring 24 m | |
| 70366 | Magnetic | 464076 | 5846817 | A2 | - | - | - | 31 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70367 | Magnetic | 463601 | 5846121 | A2 | - | - | - | 29 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70368 | Dark reflector | 463238 | 5845318 | A2 | 3.6 | 0.6 | 0.4 | - | A long and thin distinct dark reflector with a large but dull shadow, very distinct anomaly on a rough and uneven area of the seabed, possibly in a slight depression | |
| 70369 | Dark reflector | 463126 | 5845352 | A2 | 3.2 | 2.2 | 0.3 | - | A very distinctive rectangular shaped dark reflector with a dull shadow, feature possibly has some scouring orientated north and measuring 40 m | |
| 70370 | Magnetic | 462912 | 5845478 | A2 | - | - | - | 18 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70371 | Magnetic | 462780 | 5845538 | A2 | - | - | - | 11 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70372 | Dark reflector | 462763 | 5846108 | A2 | 3.8 | 0.7 | 0.5 | - | A medium sized rectangular shaped dark reflector with a bright and tapered shadow, possibly broken in two and located on a sandwave rich are of the seabed | |
| 70373 | Magnetic | 462342 | 5844954 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70374 | Debris field | 462243 | 5846617 | A2 | 8.4 | 3.8 | 0.7 | - | A medium sized possible area of debris. Three very distinct and aligned circular dark reflectors with bright, bulbous shadows, with some scouring. The full extent of the features may be buried by sandwaves | |
| 70375 | Dark reflector | 461996 | 5850153 | A2 | 4.2 | 1.3 | 0.6 | - | A distinct medium sized curvilinear shaped dark reflector with a bright, tapered shadow, isolated anomaly with scouring orientated north-west and measuring 50 m | |
| 70376 | Debris | 461852 | 5846402 | A2 | 3.6 | 0.6 | 0.3 | - | A very distinct long and curvilinear shaped dark reflector with a bright shadow, has some slight scour or sediment build up to the north measuring 4.5 m | |
| 70377 | Debris | 461821 | 5845391 | A2 | 8.5 | 0.5 | 0.2 | - | A long and thin linear dark reflector with a bright shadow and situated in a slight depression, located on the edge of a sandwave, possibly debris | |
| 70378 | Magnetic | 461635 | 5851612 | A2 | - | - | - | 9 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70379 | Debris field | 461596 | 5850052 | A2 | 29.0 | 11.0 | 0.5 | - | A large spread of debris comprising six dark reflectors, five of which have shadows. The largest is a long and thin curvilinear feature with dimensions of 22.6 m x 1 m, located in an area of sandwaves and the full extent may be buried. In the bathymetry data this is visible as a large and distinct mound with little height in an area of small sandwaves. Oval shaped and anomalous to the surrounding seabed, there is a slight depression within the mound's centre | |
| 70380 | Debris | 461555 | 5851073 | A2 | 8.8 | 1.6 | 0.1 | - | A curved dark reflector with corresponding curvilinear shadow. Has scouring associated orientated north-west and measuring 32.5 m, possible debris | |
| 70381 | Dark reflector | 461439 | 5851955 | A2 | 12.3 | 1.2 | 0.6 | - | A medium sized curvilinear shaped dark reflector with a bright triangular shaped shadow. Some faint possible scouring orientated north-west and measuring 5.4 m is associated. | |
| 70382 | Magnetic | 461374 | 5850385 | A2 | - | - | - | 23 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70383 | Debris | 461351 | 5850856 | A2 | 5.8 | 0.4 | 0.2 | - | A very distinct, long curvilinear dark reflector with a short but bright shadow and situated in a depression, possible item of debris | |
| 70384 | Dark reflector | 461287 | 5846389 | A2 | 9.0 | 0.5 | 0 | - | A very long and thick linear dark reflector with no shadow. Distinct feature located within sandwaves, looks more anthropogenic than natural. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70385 | Bright reflector | 461270 | 5850984 | A2 | 17.7 | 2.1 | 0 | - | Possible wide curvilinear shaped bright reflector in poor quality data, does not look like a sandwave. Not visible in bathymetry data. | |
| 70386 | Dark reflector | 461051 | 5847518 | A2 | 2.6 | 0.5 | 0.2 | - | An indistinct thin linear dark reflector with a bright shadow. Isolated anomaly in noisy data | |
| 70387 | Dark reflector | 460834 | 5844988 | A2 | 12.8 | 0.5 | 0 | - | Long and thin linear dark reflector with no shadow, possibly in a slight depression. Not visible in bathymetry data. | |
| 70388 | Magnetic | 460694 | 5847360 | A2 | - | - | - | 37 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70389 | Debris | 460582 | 5851838 | A2 | 5.8 | 0.8 | 0.3 | - | Very distinct dark reflector with a bright shadow, a curvilinear feature distinct and isolated on a sandy and even area of the seabed. Possibly debris | |
| 70390 | Magnetic | 460421 | 5847701 | A2 | - | - | - | 43 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70391 | Dark reflector | 460364 | 5846227 | A2 | 2.4 | 1.2 | 0.3 | - | A small dark reflector with a very bright shadow and sediment build up around its extent. Possibly natural though distinct on a sandy area of the seabed | |
| 70392 | Dark reflector | 460345 | 5851503 | A2 | 6.1 | 1.5 | 0.7 | - | A right angled dark reflector with bright triangular shadow, possibly natural though distinctive and isolated on a sandy area of the seabed | |
| 70393 | Dark reflector | 460314 | 5848410 | A2 | 3.7 | 1.1 | 0.5 | - | A distinct long and curvilinear shaped dark reflector with a bright shadow and situated in a depression, located within sandwaves | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70394 | Dark reflector | 460279 | 5851418 | A2 | 2.4 | 1.5 | 0.3 | - | A distinct rounded dark reflector with a bright shadow. Possibly large rock though quite infrequent on this area of the seabed. Located within sandwaves. | |
| 70395 | Magnetic | 460265 | 5846817 | A2 | - | - | - | 41 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70396 | Debris field | 460236 | 5854038 | A2 | 28.8 | 11.9 | 1.1 | - | Large spread of possible debris. It appears to be a hollow oval shaped indistinct dark reflector with two long and thin curvilinear ropes/chain coming off it, located on a gravelly area of the seabed. | |
| 70397 | Dark reflector | 459916 | 5844318 | A2 | 3.9 | 0.3 | 0.3 | - | A very distinct curvilinear dark reflector with a bright shadow, possibly slightly stretched in data, isolated feature | |
| 70398 | Magnetic | 459845 | 5848062 | A2 | - | - | - | 189 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70399 | Debris field | 459385 | 5845426 | A2 | 9.5 | 8.0 | 2.5 | - | A large, but indistinct spread of possible debris. Thick curvilinear shaped dark reflector with a very large and bright shadow. The feature is situated within sandwaves and may be partially buried. There is some scouring to the south and possible scour or a smaller scatter of debris to the north measuring 14 m. In the bathymetry data this is visible as a medium sized distinct rounded mound with height situated in a depression and with associated scouring 2 m deep, orientated north and measuring 100 m | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70400 | Debris | 459354 | 5845416 | A2 | 3.8 | 2.1 | 0.6 | - | A medium sized angular shaped dark reflector with a thin bright shadow, situated in a depression with scouring orientated to the north and measuring 7.7 m. | |
| 70401 | Magnetic | 457715 | 5844963 | A2 | - | - | - | 57 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70402 | Magnetic | 457658 | 5844953 | A2 | - | - | - | 266 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70403 | Magnetic | 457049 | 5844090 | A2 | - | - | - | 13 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70404 | Magnetic | 456701 | 5844519 | A2 | - | - | - | 64 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70405 | Magnetic | 456350 | 5843541 | A2 | - | - | - | 90 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70406 | Magnetic | 455205 | 5843522 | A2 | - | - | - | 38 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70407 | Bright reflector | 455075 | 5844256 | A2 | 4.0 | 2.7 | 0 | - | A medium sized circular bright reflector feature located on the edge of a sandwave, anomalous to the surrounding seabed. | |
| 70408 | Dark reflector | 454424 | 5844932 | A2 | 2.8 | 0.7 | 0 | - | A long and thick linear dark reflector with no shadow, very distinct feature located within sandwaves | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70409 | Debris field | 454152 | 5844749 | A2 | 23.0 | 12.0 | 1.0 | - | A large area of possible debris, appears as a scattering of tiny dark reflectors. Possibly partially covered by sands, feature is distinct and anomalous to the surrounding seabed, located within sandwaves which may be disguising the full extent. In the bathymetry this is visible as a large and distinct oval shaped mound situated within small sandwaves. Very distinct and isolated feature. | |
| 70410 | Debris | 454044 | 5844958 | A2 | 3.8 | 1.1 | 0.3 | - | A long and thick curvilinear dark reflector with a shadow. Very distinct feature in an area of sandwaves, possible debris | |
| 70411 | Magnetic | 453482 | 5843765 | A2 | - | - | - | 6 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70412 | Magnetic | 453207 | 5843922 | A2 | - | - | - | 18 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70413 | Debris | 452921 | 5843296 | A2 | 17.8 | 0.8 | 0.0 | - | Broken up or disjointed linear shaped bright reflector feature, large and indistinct anomaly on a sandy area of the seabed, isolated possible debris feature. Not visible in bathymetry data. | |
| 70414 | Magnetic | 452700 | 5844836 | A2 | - | - | - | 44 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70415 | Magnetic | 452631 | 5844717 | A2 | - | - | - | 10 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70416 | Magnetic | 452252 | 5843213 | A2 | - | - | - | 6 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70417 | Debris | 452221 | 5842953 | A2 | 4.6 | 0.4 | 0.1 | - | A long and thin distinct linear dark reflector with a bright shadow, isolated possible debris | |
| 70418 | Magnetic | 451919 | 5843240 | A2 | - | - | - | 7 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70419 | Debris field | 450816 | 5843285 | A2 | 19.9 | 17.2 | 0.3 | - | Possible group of debris made up of distinct dark reflectors with shadows, some small circular (1 m x 0.4 m) and larger linear (5 m x 0.4 m) anomalies, approximately 15 in total over a large area. Nothing visible in bathymetry data. | |
| 70420 | Dark reflector | 450806 | 5842974 | A2 | 5.3 | 1.7 | 0.2 | - | An oval shaped dark reflector/circular group of small dark reflectors with shadows, may be a gravel patch or rocks | |
| 70421 | Debris | 450787 | 5842981 | A2 | 4.4 | 0.3 | 0.2 | - | A long and thin linear dark reflector with a bright shadow, located in between sandwaves, possibly linear debris | |
| 70422 | Dark reflector | 450781 | 5842606 | A2 | 3.3 | 1.4 | 0.1 | - | Very distinctive dark reflector with a bright shadow located in between sandwaves, possibly broken in two parts or partially buried in its centre. Rectangular shaped feature | |
| 70423 | Dark reflector | 450781 | 5842981 | A2 | 1.8 | 1.3 | 0.3 | - | A disjointed or partially broken up distinct dark reflector with a bright shadow. Located in between sandwaves, may be natural | |
| 70424 | Magnetic | 450644 | 5842687 | A2 | - | - | - | 79 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70425 | Magnetic | 450469 | 5843104 | A2 | - | - | - | 30 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70426 | Magnetic | 450459 | 5842806 | A2 | - | - | - | 19 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70427 | Magnetic | 450457 | 5843861 | A2 | - | - | - | 365 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70428 | Magnetic | 450450 | 5843838 | A2 | - | - | - | 11 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70429 | Magnetic | 450445 | 5844334 | A2 | - | - | - | 9 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70430 | Dark reflector | 450175 | 5844259 | A2 | 2.8 | 0.3 | 0.2 | - | A long and thin linear dark reflector with a dull shadow, situated at the edge of a sandwave but does not look part of them | |
| 70431 | Magnetic | 450129 | 5843224 | A2 | - | - | - | 108 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70432 | Magnetic | 450096 | 5843177 | A2 | - | - | - | 45 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70433 | Magnetic | 450066 | 5843086 | A2 | - | - | - | 58 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70434 | Dark reflector | 450064 | 5842559 | A2 | 3.0 | 0.9 | 0.2 | - | A long and thick rectangular dark reflector with a bright shadow, located in between sandwaves, very distinct feature | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70435 | Dark reflector | 450060 | 5843704 | A2 | 3.5 | 0.8 | 0.3 | - | A long and thin linear dark reflector with a bright shadow, distinct feature located in between sandwaves, tagged mainly due to length, lots of similar but smaller features on this area of the seabed | |
| 70436 | Magnetic | 449995 | 5843028 | A2 | - | - | - | 37 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70437 | Dark reflector | 449882 | 5844269 | A2 | 4.5 | 1.0 | 0.4 | - | A very thin slightly curvilinear dark reflector with a right angled end. Feature has a very bright shadow and is distinct within an area of sandwaves | |
| 70438 | Dark reflector | 449840 | 5844210 | A2 | 3.8 | 0.5 | 1.3 | - | A large curvilinear shaped dark reflector with a bright shadow. Distinct anomaly located within sandwaves - does not look to be part of them | |
| 70439 | Dark reflector | 449615 | 5843736 | A2 | 8.2 | 1.9 | 0.1 | - | An indistinct curvilinear dark reflector with a shadow in parts. Feature looks disjointed or partially buried between sandwaves | |
| 70440 | Magnetic | 449571 | 5842924 | A2 | - | - | - | 79 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70441 | Magnetic | 449427 | 5842568 | A2 | - | - | - | 28 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70442 | Magnetic | 449401 | 5842568 | A2 | - | - | - | 35 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70443 | Magnetic | 449391 | 5843836 | A2 | - | - | - | 16 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70444 | Magnetic | 449156 | 5843838 | A2 | - | - | - | 30 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70445 | Magnetic | 448908 | 5842930 | A2 | - | - | - | 145 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70446 | Dark reflector | 448792 | 5843781 | A2 | 4.0 | 0.8 | 0 | - | A long and thin linear dark reflector with no shadow, possibly in a slight depression. Looks more anthropogenic than surrounding seabed features. | |
| 70447 | Magnetic | 448669 | 5844394 | A2 | - | - | - | 14 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70448 | Magnetic | 448632 | 5844142 | A2 | - | - | - | 17 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70449 | Debris | 448556 | 5843957 | A2 | 7.4 | 1.0 | 0.3 | - | Possible object with rope or chain attached. An indistinct dark reflector measuring 1m x 0.6 m with a dull shadow and possible rope orientated to the north visible as a very indistinct curvilinear thin dark reflector | |
| 70450 | Magnetic | 447837 | 5842659 | A2 | - | - | - | 20 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70451 | Dark reflector | 447615 | 5844361 | A2 | 3.4 | 0.4 | 0.2 | - | A distinctive irregular shaped linear dark reflector with a dull shadow, located in between sandwaves and looks to be an object rather than part of them | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70452 | Magnetic | 447578 | 5843824 | A2 | - | - | - | 20 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70453 | Magnetic | 447236 | 5844040 | A2 | - | - | - | 48 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70454 | Magnetic | 447062 | 5844336 | A2 | - | - | - | 49 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70455 | Debris | 446424 | 5843694 | A2 | 4.9 | 2.8 | 0.2 | 277 | A distinct but thin right angled linear dark reflector with a bright shadow. Has a large magnetic anomaly associated indicating ferrous debris | |
| 70456 | Debris field | 446339 | 5844375 | A2 | 25.8 | 18.1 | 0.9 | - | A large spread of possible debris, 250 m from wreck 70459. Approximately nine small irregularly shaped dark reflectors, some with shadows, some without. The debris field is located on an area of sandwaves and the full extent may be buried. Largest feature measures 2.7 m x 1.8 m | |
| 70457 | Magnetic | 446199 | 5843670 | A2 | - | - | - | 287 | Large symmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70458 | Magnetic | 446154 | 5843670 | A2 | - | - | - | 299 | Large symmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70459 | Wreck | 446041 | 5844450 | A1 | 88.0 | 40.0 | 10.0 | 775 | A wreck broken in two. In the sidescan data a large spread of highly dispersed wreck debris is visible, with some structure and possible deck planking discernible as parallel dark reflectors with shadows. The stern and hull are not clear and the full extent of the wreck is likely buried by the large sandwaves in the area. In the bathymetry data the wreck is clearly lying in two parts 17m from one another with both sections orientated north-west to south-east. There is a large amount of scouring visible orientated north-west to south-east and measuring over 100m. The individual dimensions of the northern section are 41m x 23m x 10m and the southern section are 44m x 19m x 8m. The wreck has a large magnetic anomaly associated indicating a ferrous composition. In the UKHO database this is recorded as Phillip M, a steam ship with dimensions of 80.5m x 11.9m x 7m which was torpedoed and sunk in 1944. The wreck is described as lying in two parts on the seabed, probably inverted, with measurements of 55m x 30m x 7.7m last observed in 1999. | 11092 (UKHO) |
| 70460 | Debris | 446039 | 5844401 | A1 | 1.6 | 0.2 | 0.2 | - | Small piece of possible wreck debris, a thin curvilinear dark reflector with a shadow located within sandwaves and situated 27 m south-west of wreck 70459 | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70461 | Bright reflector | 445715 | 5844227 | A2 | 7.3 | 1.1 | 0 | - | A large and thick curvilinear bright reflector, one end appears to fork, very distinct anomaly on a rough and uneven area of the seabed, situated within sandwaves. | |
| 70462 | Magnetic | 445598 | 5844152 | A2 | - | - | - | 208 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70463 | Magnetic | 445231 | 5843920 | A2 | - | - | - | 40 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70464 | Magnetic | 445145 | 5843920 | A2 | - | - | - | 140 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70465 | Magnetic | 444825 | 5844171 | A2 | - | - | - | 125 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70466 | Magnetic | 444242 | 5843639 | A2 | - | - | - | 66 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70467 | Magnetic | 444149 | 5843070 | A2 | - | - | - | 61 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70468 | Magnetic | 443703 | 5844186 | A2 | - | - | - | 42 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70469 | Magnetic | 443609 | 5843618 | A2 | - | - | - | 26 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70470 | Debris | 443566 | 5844007 | A2 | 2.5 | 1.0 | 0 | - | Possible rounded dark reflector object with no shadow (0.9 x 0.7 m) with a rope or chain attached, again with no shadow. Located within an area of large sandwaves. | |
| 70471 | Magnetic | 443536 | 5843665 | A2 | - | - | - | 45 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70472 | Magnetic | 443387 | 5843746 | A2 | - | - | - | 146 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70473 | Dark reflector | 443201 | 5842896 | A2 | 3.8 | 0.7 | 0 | - | A long and thin dark reflector with no shadow. Isolated and distinct feature on a sandy area of the seabed. | |
| 70474 | Debris | 442829 | 5844132 | A2 | 5.7 | 0.6 | 0.0 | 126 | A distinct horseshoe shaped curvilinear dark reflector with no shadow, located within sandwaves. Looks slightly broken up or buried in parts. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 70475 | Magnetic | 442811 | 5844082 | A2 | - | - | - | 40 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70476 | Magnetic | 442688 | 5844458 | A2 | - | - | - | 16 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70477 | Magnetic | 442487 | 5844254 | A2 | - | - | - | 21 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70478 | Magnetic | 442445 | 5842572 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70479 | Magnetic | 441841 | 5842994 | A2 | - | - | - | 180 | Medium anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70480 | Magnetic | 441531 | 5842566 | A2 | - | - | - | 107 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70481 | Magnetic | 441178 | 5844460 | A2 | - | - | - | 50 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70482 | Magnetic | 439306 | 5842926 | A2 | - | - | - | 17 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70483 | Magnetic | 438749 | 5842360 | A2 | - | - | - | 23 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70484 | Magnetic | 438624 | 5842364 | A2 | - | - | - | 22 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70485 | Magnetic | 438618 | 5843790 | A2 | - | - | - | 14 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70486 | Magnetic | 438489 | 5844374 | A2 | - | - | - | 10 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70487 | Magnetic | 438324 | 5844140 | A2 | - | - | - | 65 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70488 | Magnetic | 438199 | 5842052 | A2 | - | - | - | 26 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70489 | Magnetic | 437503 | 5844509 | A2 | - | - | - | 58 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70490 | Magnetic | 437457 | 5844446 | A2 | - | - | - | 45 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70491 | Dark reflector | 436891 | 5843933 | A2 | 2.4 | 0.6 | 0.1 | - | An irregularly shaped dark reflector with a bright shadow. It appears to be a thin linear feature with a rounded dark reflector at one end. Located within sandwaves, possibly natural. | |
| 70492 | Rope/chain | 436750 | 5841279 | A2 | 14.2 | 0.3 | 1.0 | - | Short, curvilinear dark reflector possibly with a slight shadow. Feature is not particularly distinct, possibly short length of rope or chain. | |
| 70493 | Rope/chain | 436598 | 5841819 | A2 | 42.7 | 0.4 | 0 | - | A long length of rope or chain, visible as a slightly curvilinear dark reflector with no shadow, possibly in a slight depression, the feature is located perpendicular to sandwaves. | |
| 70494 | Bright reflector | 436386 | 5841067 | A2 | 7.3 | 5.3 | 0 | - | Rounded bright reflector with a slightly darker reflector in the centre. Identified in an area of textured seafloor. | |
| 70495 | Bright reflector | 436136 | 5841143 | A2 | 4.9 | 0.9 | 0 | - | Straight, elongated bright reflector that appears to be quite isolated. | |
| 70496 | Magnetic | 436117 | 5841464 | A2 | - | - | - | 45 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70497 | Magnetic | 435895 | 5841784 | A2 | - | - | - | 48 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70498 | Magnetic | 435847 | 5841261 | A2 | - | - | - | 64 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70499 | Magnetic | 435847 | 5841877 | A2 | - | - | - | 61 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70500 | Magnetic | 435826 | 5841150 | A2 | - | - | - | 253 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70501 | Magnetic | 435764 | 5842595 | A2 | - | - | - | 73 | Medium symmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70502 | Magnetic | 435704 | 5842886 | A2 | - | - | - | 241 | Large anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70503 | Rope/chain | 435606 | 5842596 | A2 | 7.2 | 0.5 | 0 | - | Bright curvilinear item of debris in a 'C' shape. Possible disturbance to surrounding sediment. Not particularly distinct, possible short length of rope or chain. | |
| 70504 | Magnetic | 435552 | 5843199 | A2 | - | - | - | 63 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70505 | Magnetic | 435469 | 5843891 | A2 | - | - | - | 69 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70506 | Magnetic | 435186 | 5843596 | A2 | - | - | - | 263 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70507 | Magnetic | 434933 | 5842138 | A2 | - | - | - | 249 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70508 | Magnetic | 434576 | 5843899 | A2 | - | - | - | 255 | Large distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70509 | Magnetic | 434464 | 5840546 | A2 | - | - | - | 111 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70510 | Magnetic | 434448 | 5843370 | A2 | - | - | - | 70 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70511 | Magnetic | 434424 | 5844278 | A2 | - | - | - | 156 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70512 | Magnetic | 434420 | 5843727 | A2 | - | - | - | 294 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70513 | Magnetic | 434410 | 5840860 | A2 | - | - | - | 36 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70514 | Magnetic | 434405 | 5841204 | A2 | - | - | - | 44 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70515 | Magnetic | 434324 | 5844467 | A2 | - | - | - | 446 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70516 | Magnetic | 434307 | 5844495 | A2 | - | - | - | 132 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70517 | Dark reflector | 434300 | 5844354 | A2 | 3.2 | 0.4 | 0.3 | - | Elongated dark reflector with slight shadow | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70518 | Magnetic | 434221 | 5840653 | A2 | - | - | - | 20 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70519 | Dark reflector | 434155 | 5843628 | A2 | 2.9 | 0.7 | 1.7 | - | Relatively indistinct dark reflector with a triangular shadow. Close to similar anomaly 70520 | |
| 70520 | Bright reflector | 434147 | 5843636 | A2 | 8.0 | 3.7 | 0 | - | Slightly rectangular bright reflector with indistinct thin linear dark reflectors within this. Possibly shadows. Not particularly distinct but looks relatively anomalous. Similar contact nearby (70519). | |
| 70521 | Magnetic | 433962 | 5841796 | A2 | - | - | - | 33 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70522 | Magnetic | 433853 | 5843190 | A2 | - | - | - | 71 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70523 | Magnetic | 433852 | 5841313 | A2 | - | - | - | 37 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70524 | Magnetic | 433829 | 5840434 | A2 | - | - | - | 43 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70525 | Debris | 433768 | 5841827 | A2 | 11.8 | 3.8 | 1.0 | - | Large, irregular dark reflector, not particularly well defined but with a distinct shadow, possibly debris identified in an area of megaripples. | |
| 70527 | Magnetic | 433658 | 5845726 | A2 | - | - | - | 501 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70528 | Magnetic | 433425 | 5846588 | A2 | - | - | - | 38 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70529 | Magnetic | 433375 | 5844958 | A2 | - | - | - | 98 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70530 | Magnetic | 433316 | 5842340 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70531 | Magnetic | 433261 | 5845178 | A2 | - | - | - | 224 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70532 | Magnetic | 433196 | 5843381 | A2 | - | - | - | 32 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70533 | Magnetic | 433049 | 5841825 | A2 | - | - | - | 14 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70534 | Magnetic | 433032 | 5842317 | A2 | - | - | - | 19 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70535 | Dark reflector | 432926 | 5845457 | A2 | 3.4 | 0.4 | 0.4 | - | Small, elongated dark reflector with a broad bright reflector. Quite distinct. | |
| 70536 | Magnetic | 432891 | 5845147 | A2 | - | - | - | 37 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70537 | Magnetic | 432838 | 5845047 | A2 | - | - | - | 33 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70538 | Magnetic | 432787 | 5847169 | A2 | - | - | - | 86 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70539 | Magnetic | 432560 | 5846510 | A2 | - | - | - | 136 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70540 | Magnetic | 432506 | 5842643 | A2 | - | - | - | 57 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70541 | Magnetic | 432504 | 5840940 | A2 | - | - | - | 62 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70542 | Magnetic | 432142 | 5846243 | A2 | - | - | - | 79 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70543 | Dark reflector | 432002 | 5847855 | A2 | 19.0 | 2.1 | 0 | - | Curvilinear dark reflector with no discernible height, in an elongated 'c' shape. | |
| 70544 | Magnetic | 431993 | 5847927 | A2 | - | - | - | 94 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70545 | Magnetic | 431965 | 5848728 | A2 | - | - | - | 38 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70546 | Magnetic | 431910 | 5848089 | A2 | - | - | - | 105 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70547 | Bright reflector | 431845 | 5847684 | A2 | 2.8 | 1.6 | 0 | - | Small bright reflector, with darker reflector around rim. Possibly a natural feature. | |
| 70548 | Magnetic | 431842 | 5844213 | A2 | - | - | - | 31 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70549 | Magnetic | 431708 | 5848772 | A2 | - | - | - | 121 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70550 | Magnetic | 431696 | 5844740 | A2 | - | - | - | 78 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70551 | Magnetic | 431658 | 5842024 | A2 | - | - | - | 44 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70552 | Dark reflector | 431645 | 5846233 | A2 | 7.2 | 0.5 | 0.5 | - | Long, straight and narrow dark reflector with a broad, distinct shadow. Identified in an area of textured seafloor. | |
| 70553 | Magnetic | 431620 | 5845127 | A2 | - | - | - | 68 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70554 | Magnetic | 431616 | 5844790 | A2 | - | - | - | 79 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70555 | Dark reflector | 431549 | 5847373 | A2 | 4.4 | 0.4 | 0.3 | - | Curved elongated dark reflector with an irregular shadow identified in an area of megaripples. | |
| 70556 | Dark reflector | 431534 | 5846342 | A2 | 6.3 | 2.0 | 0.4 | - | Straight elongated dark reflector with a larger dark contact at the front. Slight shadow and some possible disturbance to surrounding sediment. | |
| 70557 | Bright reflector | 431519 | 5847683 | A2 | 4.6 | 1.3 | 0 | - | Distinct, curved bright reflector. Possibly a shadow but with no discernible contact. Identified in an area of textured seafloor, may be part of a natural formation. | |
| 70558 | Magnetic | 431504 | 5842911 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70559 | Magnetic | 431484 | 5841571 | A2 | - | - | - | 59 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70560 | Dark reflector | 431458 | 5848228 | A2 | 2.3 | 0.6 | 0.2 | - | Small dark reflector with a slightly angular shadow. Identified in an area of ripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 70561 | Dark reflector | 431428 | 5844360 | A2 | 4.0 | 0.5 | 0.2 | - | Straight, short dark reflector with a very slight shadow. Feature is not particularly distinct. | |
| 70562 | Dark reflector | 431412 | 5846495 | A2 | 3.4 | 0.3 | 0.2 | - | Short, straight dark reflector with a slightly rounded shadow. | |
| 70563 | Dark reflector | 431386 | 5848806 | A2 | 3.5 | 0.3 | 0.2 | - | Small, slightly elongated dark reflector with a slight shadow. | |
| 70564 | Magnetic | 431261 | 5848896 | A2 | - | - | - | 122 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70565 | Wreck | 431217 | 5841986 | A1 | 70.0 | 31.0 | 6.3 | 200 | A possible area of dispersed wreck, visible in the sidescan data as several dark reflectors that are not always distinct, with broad shadows. An elongated dark reflector with some possible associated scour and a distinct, rounded shadow is also visible which may be part of some vessel structure. In the bathymetry data this is visible as a large wreck situated within sandwaves and partially buried by sediments. The wreck appears to be broken up with large sections disjointed from the main structure of the wreck. There is some scouring coming from the wreck orientated south-east and measuring approximately 50m. A large magnetic anomaly is associated indicating some ferrous content. In the UKHO record this is an unknown wreck described as being broken up and almost buried by sandwaves with debris in the wrecks vicinity, likely boilers and engine. | 10722 (UKHO); 892268 (NRHE) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70566 | Magnetic | 431129 | 5844010 | A2 | - | - | - | 40 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70567 | Magnetic | 431088 | 5843109 | A2 | - | - | - | 22 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70568 | Bright reflector | 431067 | 5848781 | A2 | 2.6 | 1.0 | 0 | - | Two short, straight bright reflectors close to each other. Image possibly distorted by movement of the sonar fish. | |
| 70569 | Magnetic | 431048 | 5843905 | A2 | - | - | - | 58 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70570 | Magnetic | 431035 | 5848341 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70571 | Magnetic | 431007 | 5847422 | A2 | - | - | - | 305 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70572 | Magnetic | 430952 | 5842480 | A2 | - | - | - | 225 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70573 | Dark reflector | 430914 | 5845897 | A2 | 4.1 | 0.2 | 0.2 | - | Slightly curved elongated dark reflector with a very slight shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70574 | Debris field | 430902 | 5848141 | A2 | 31.0 | 13.0 | 1.3 | 106 | Large area of possible debris, some slightly darker reflectors and bright reflectors, some of which appear to be relatively straight. Not particularly distinct. In the bathymetry data this is visible as a large oval mound, located on a rough and sandwave rich area of the seabed. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 70575 | Dark reflector | 430895 | 5845895 | A2 | 6.0 | 0.3 | 0.3 | - | Small, relatively straight dark reflector with a slight shadow. In line with another similar contact, possibly part of the same, partially buried feature. | |
| 70576 | Debris | 430895 | 5848188 | A2 | 4.8 | 1.9 | 0.9 | 158 | A distinct but poorly defined dark reflector with height identified in an area of megaripples. Some disturbance to surrounding sediment. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 70577 | Magnetic | 430893 | 5843903 | A2 | - | - | - | 58 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70578 | Magnetic | 430888 | 5847340 | A2 | - | - | - | 55 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70579 | Dark reflector | 430872 | 5843755 | A2 | 2.5 | 0.2 | 0.2 | - | Straight, narrow dark reflector with a very slight shadow. Not particularly distinct | |
| 70580 | Magnetic | 430872 | 5847034 | A2 | - | - | - | 99 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70581 | Dark reflector | 430804 | 5848049 | A2 | 3.0 | 0.6 | 0.2 | - | Small, distinct dark reflector with a very slight shadow. Identified in an area of megaripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70582 | Dark reflector | 430756 | 5846123 | A2 | 3.0 | 0.2 | 0.1 | - | Short, straight distinct dark reflector with a very slight shadow | |
| 70583 | Dark reflector | 430721 | 5844754 | A2 | 6.9 | 0.8 | 0.6 | - | Straight, narrow dark reflector with a distinct but irregular shadow. Feature is identified in an area of, and perpendicular to, megaripples. | |
| 70584 | Magnetic | 430668 | 5843112 | A2 | - | - | - | 61 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70585 | Magnetic | 430619 | 5843102 | A2 | - | - | - | 31 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70586 | Magnetic | 430610 | 5848511 | A2 | - | - | - | 92 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70587 | Magnetic | 430609 | 5844209 | A2 | - | - | - | 364 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70588 | Magnetic | 430606 | 5848846 | A2 | - | - | - | 94 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70589 | Magnetic | 430520 | 5848897 | A2 | - | - | - | 45 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70590 | Magnetic | 430503 | 5847230 | A2 | - | - | - | 151 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70591 | Magnetic | 430494 | 5848400 | A2 | - | - | - | 39 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70592 | Magnetic | 430456 | 5847097 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70593 | Magnetic | 430444 | 5845598 | A2 | - | - | - | 67 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70594 | Magnetic | 430412 | 5848557 | A2 | - | - | - | 23 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70595 | Magnetic | 430409 | 5848055 | A2 | - | - | - | 594 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70596 | Magnetic | 430362 | 5847371 | A2 | - | - | - | 663 | Large anomaly monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70597 | Dark reflector | 430308 | 5845494 | A2 | 6.9 | 2.0 | 1.7 | - | Two dark reflectors or one broken up dark reflector with a distinct, irregular shadow. Feature identified in an area of textured seafloor. | |
| 70598 | Bright reflector | 430297 | 5848546 | A2 | 5.4 | 3.3 | 0 | - | Triangular bright reflector with a small dark reflector at front. In an area of textured seafloor, looks anomalous. | |
| 70599 | Magnetic | 430290 | 5845592 | A2 | - | - | - | 92 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70600 | Magnetic | 430260 | 5845299 | A2 | - | - | - | 79 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70601 | Seafloor disturbance | 430166 | 5847846 | A2 | 10.7 | 6.3 | 0.3 | - | Possible 'X' shaped seafloor disturbance, comprised of some bright reflectors and some dark reflectors, possibly with height. | |
| 70602 | Magnetic | 430144 | 5845429 | A2 | - | - | - | 841 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70603 | Magnetic | 430137 | 5849410 | A2 | - | - | - | 428 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70604 | Magnetic | 430137 | 5848871 | A2 | - | - | - | 44 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70605 | Magnetic | 430128 | 5849097 | A2 | - | - | - | 428 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70606 | Magnetic | 430106 | 5846681 | A2 | - | - | - | 28 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70607 | Magnetic | 430095 | 5848288 | A2 | - | - | - | 225 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70608 | Magnetic | 430033 | 5847568 | A2 | - | - | - | 294 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70609 | Magnetic | 429987 | 5846807 | A2 | - | - | - | 60 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70610 | Dark reflector | 429842 | 5849672 | A2 | 1.4 | 0.6 | 0.8 | - | Small dark reflector with a distinct but tapered shadow. Identified in an area of megaripples, appears quite distinct. | |
| 70611 | Magnetic | 429816 | 5845514 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70612 | Magnetic | 429794 | 5848360 | A2 | - | - | - | 99 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70613 | Magnetic | 429783 | 5849881 | A2 | - | - | - | 130 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70614 | Magnetic | 429772 | 5847316 | A2 | - | - | - | 52 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70615 | Magnetic | 429652 | 5846468 | A1 | - | - | - | 1697 | Very large negative monopole only identified on one survey line. Indicative of possible substantial buried ferrous debris. | |
| 70616 | Debris | 429625 | 5848286 | A2 | 3.0 | 1.6 | 0.4 | - | Slightly square object, not particularly distinct. Comprises four, short, straight, parallel dark reflectors with a slight shadow, possibly debris | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|--------------------------------|
| 70617 | Wreck | 429617 | 5846348 | A1 | 56.7 | 47.0 | 6.4 | 6367 | Large wreck possibly in two parts, lying perpendicular to one another. Identified as distinct dark reflectors with broad shadows. The wreck appears to be intact in its two parts, with the majority of the hull intact and with deck structure visible as some straight, slatted features. In the bathymetry data the wreck is clearly broken in two parts with some standing structure visible. The two parts measure 77m in length when added together in the bathymetry data, close to the original recorded dimensions (73.2m). There is a very large magnetic anomaly associated indicating a ferrous construction. The UKHO records this as the <i>Rye</i> , a steamship lying in two parts at right angles, sunk in 1941 by torpedo fire. Original dimensions were 73.2m x 10.4m x 4.6m. Last observed in 2014 with dimensions 40m x 40m x 6m. | 10544 (UKHO); 907459 (NRHE) |
| 70618 | Debris | 429562 | 5846957 | A1 | 3.1 | 2.5 | 2.0 | 1182 | Distinct dark reflector with a broad shadow. Feature identified in an area of textured seafloor. Has a very large magnetic anomaly associated indicating ferrous debris | |
| 70619 | Dark reflector | 429554 | 5848941 | A2 | 7.0 | 2.4 | 1.0 | - | Irregularly shaped dark reflector with a broad, slightly irregular shadow. Identified as two rounded dark reflectors connected in the centre | |
| 70620 | Debris | 429512 | 5846995 | A2 | 3.4 | 1.9 | 2.0 | 67 | Distinct dark reflector with a broad shadow. Feature identified in an area of textured seafloor. Has a medium magnetic anomaly associated indicating ferrous debris | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70621 | Magnetic | 429501 | 5845892 | A2 | - | - | - | 129 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70622 | Magnetic | 429492 | 5846128 | A2 | - | - | - | 45 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70623 | Magnetic | 429458 | 5847054 | A2 | - | - | - | 515 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70624 | Debris | 429364 | 5847229 | A2 | 4.1 | 2.2 | 1.4 | 202 | Distinct dark reflector with a broad shadow. Feature identified in an area of textured seafloor. Has a large magnetic anomaly associated indicating ferrous debris | |
| 70625 | Magnetic | 429359 | 5848209 | A2 | - | - | - | 133 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70626 | Magnetic | 429316 | 5847322 | A2 | - | - | - | 270 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70627 | Magnetic | 429254 | 5847128 | A2 | - | - | - | 72 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70628 | Magnetic | 429137 | 5849801 | A2 | - | - | - | 43 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70629 | Magnetic | 429095 | 5848900 | A2 | - | - | - | 212 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70630 | Magnetic | 429074 | 5845972 | A2 | - | - | - | 66 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70631 | Magnetic | 429062 | 5847041 | A2 | - | - | - | 27 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70632 | Magnetic | 429055 | 5846006 | A2 | - | - | - | 51 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70633 | Dark reflector | 429036 | 5846962 | A2 | 4.4 | 0.4 | 0.3 | - | Very narrow, straight dark reflector with a slight shadow. Not particularly distinct. | |
| 70634 | Magnetic | 429030 | 5848829 | A2 | - | - | - | 81 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70635 | Magnetic | 429026 | 5849810 | A2 | - | - | - | 48 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70636 | Magnetic | 428994 | 5847172 | A2 | - | - | - | 55 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70637 | Magnetic | 428946 | 5849408 | A2 | - | - | - | 113 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70638 | Magnetic | 428889 | 5849291 | A2 | - | - | - | 58 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 70639 | Wreck | 428802 | 5847632 | A1 | 146.4 | 46.6 | 11.7 | 818 | Large dispersed wreck. Possibly two sections of wreck visible. A thick slightly curvilinear dark reflector, possibly the hull edge, is discernible in the sidescan sonar data. The wreck is comprised of numerous straight dark reflectors with shadows. The wreck is orientated north-west to south-east and lies perpendicular to the large sandwaves. The full extent and detail is likely covered by sands. The wreck has a possible associated piece of debris at its northern end (70640) which is a long, thin and indistinct linear dark reflector with a broad shadow and dimensions of 20.5m x 1.1m x 3.3m. In the bathymetry data the wreck appears upright and with some structure visible. There is a large magnetic anomaly associated with the wreck indicating a ferrous construction. The UKHO records this wreck as the Trevethoe, a motor vessel built in 1940 and sunk in 1941, with original dimensions of 131.8m x 17.1m x 7.5m. Last observed in 2014 as upright but collapsed and in two parts with dimensions 140m x 25m x 5m. | 10546 (UKHO); 907460 (NRHE) |
| 70640 | Debris | 428758 | 5847714 | A1 | 20.5 | 1.1 | 3.3 | - | A long, thin and indistinct linear dark reflector, with a long, broad shadow. Possible wreck debris located 9 m to the north-west of wreck 70639 | |
| 70641 | Magnetic | 428647 | 5848054 | A2 | - | - | - | 45 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70642 | Dark reflector | 428588 | 5848570 | A2 | 11.3 | 0.4 | 0.1 | - | Long and thin curvilinear dark reflector with a slight but distinct shadow. | |
| 70643 | Magnetic | 428505 | 5849281 | A2 | - | - | - | 676 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70644 | Magnetic | 428419 | 5849889 | A2 | - | - | - | 28 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70645 | Wreck | 428283 | 5848091 | A1 | 24.0 | 8.5 | 5.4 | 52 | Medium sized wreck, visible as a distinct dark reflector outline that is likely the hull, with some dark reflectors in its centre. The wreck has a broad, irregular and distinct shadow and has been identified in an area of megaripples. There is a possible broken off linear piece of debris extending from the wreck in one of the sidescan sonar images. The wreck is orientated north-east to south-west. In the bathymetry data this is visible as a large and distinct wreck lying in between large sandwaves. The wreck is intact and upright with some slight scouring orientated north-east to south-west and measuring 16m either side. There is a medium magnetic anomaly associated with this wreck indicating some ferrous debris, though the nearest line of data is 25m from the wrecks location. In the UKHO record this is an unknown wreck that is largely intact and partially buried, previously observed in 2016 with dimensions of 24m x 10m x 4m. | 82114 (UKHO) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70646 | Dark reflector | 428180 | 5849375 | A2 | 2.6 | 0.3 | 0.1 | - | Short, straight narrow dark reflector with a slight but distinct shadow. | |
| 70647 | Dark reflector | 428169 | 5849394 | A2 | 5.4 | 0.4 | 0.1 | - | Short, straight narrow dark reflector with a slight but distinct shadow. Feature is not particularly distinct. | |
| 70648 | Magnetic | 428107 | 5849613 | A2 | - | - | - | 93 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70649 | Magnetic | 428061 | 5848208 | A2 | - | - | - | 56 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70650 | Magnetic | 428002 | 5849599 | A2 | - | - | - | 78 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70651 | Debris field | 427880 | 5849577 | A2 | 16.4 | 6.9 | 0.6 | - | A medium sized spread of possible debris comprising approximately eight dark reflectors with height. Possibly natural however looks a little anomalous. Possible debris field. | |
| 70652 | Dark reflector | 427831 | 5848600 | A2 | 2.9 | 0.4 | 0.2 | - | Short, straight dark reflector with slight height. | |
| 70653 | Magnetic | 427682 | 5849792 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70654 | Dark reflector | 427667 | 5848061 | A2 | 2.6 | 0.3 | 0.6 | - | Straight, narrow dark reflector with a broad shadow. Numerous similar but smaller contacts identified nearby | |
| 70655 | Magnetic | 427658 | 5850018 | A2 | - | - | - | 29 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70656 | Magnetic | 427425 | 5849416 | A2 | - | - | - | 136 | Medium and distinctive dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70657 | Magnetic | 427326 | 5848829 | A2 | - | - | - | 38 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70658 | Dark reflector | 427033 | 5850434 | A2 | 4.6 | 0.4 | 0.3 | - | Small, short, straight dark reflector with a slight shadow. | |
| 70659 | Wreck | 426967 | 5850445 | A1 | 56.0 | 22.0 | 6.7 | 9466 | Large wreck that appears to be intact though possibly partially buried by sandwaves. It is possibly listing slightly to the starboard side and has a broad shadow. Some elongated straight dark reflectors are visible. The wreck is orientated east to west with a large amount of scouring orientated north-west to south-east. In the bathymetry data the wreck appears to cut through a megaripple. There is a very large magnetic anomaly associated indicating a ferrous construction. The UKHO record (10849) gives this as an unknown wreck lying in two parts, last observed in 2014 with dimensions of 50m x 10m x 5.1m. | 10849 (UKHO) |
| 70660 | Magnetic | 426880 | 5849236 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70661 | Dark reflector | 426817 | 5850012 | A2 | 6.9 | 0.9 | 0.3 | - | Narrow dark reflector with a broad shadow. A distinct 's' shaped dark reflector identified in front of the contact. Feature looks a little anomalous. | |
| 70662 | Magnetic | 426787 | 5848935 | A2 | - | - | - | 18 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70663 | Magnetic | 426760 | 5850126 | A2 | - | - | - | 340 | Large anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70665 | Debris field | 426553 | 5849978 | A2 | 24.7 | 14.0 | 3.2 | 194 | An indistinct possible debris field comprising an area of numerous small dark reflectors, some of which appear to be slightly slatted, with distinct, irregular shadows. Located on a very rough and uneven area of the seabed with sandwaves. The full extent is possibly buried by sands. In the bathymetry data this is visible as an indistinct medium sized triangular mound that appears to be largely covered by sediment. The orientation is unclear, possibly north-east to south-west. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 70666 | Magnetic | 426493 | 5850084 | A2 | - | - | - | 26 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70667 | Magnetic | 426488 | 5849307 | A2 | - | - | - | 16 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70668 | Magnetic | 426435 | 5849675 | A2 | - | - | - | 57 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70669 | Magnetic | 426319 | 5848674 | A2 | - | - | - | 27 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70670 | Rope/chain | 426220 | 5849495 | A2 | 55.0 | 0.2 | 0.2 | - | Straight , narrow linear item with a very slight shadow. Identified in an area of megaripples. Feature appears to be slightly intermittent suggesting partial burial by mobile sediments. Possible rope or chain. | |
| 70671 | Magnetic | 426213 | 5850327 | A2 | - | - | - | 15 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70672 | Dark reflector | 426185 | 5850409 | A2 | 2.8 | 0.9 | 0.4 | - | Short, straight dark reflector in an patch of disturbed seafloor in an area of megaripples, looks distinct | |
| 70673 | Magnetic | 426145 | 5849832 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70674 | Magnetic | 426063 | 5850154 | A2 | - | - | - | 40 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70675 | Magnetic | 426015 | 5849775 | A2 | - | - | - | 19 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70676 | Magnetic | 425970 | 5850552 | A2 | - | - | - | 54 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70677 | Magnetic | 425963 | 5849551 | A2 | - | - | - | 15 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70678 | Magnetic | 425937 | 5850353 | A2 | - | - | - | 24 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70679 | Magnetic | 425884 | 5850357 | A2 | - | - | - | 61 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70680 | Magnetic | 425702 | 5850101 | A2 | - | - | - | 41 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70681 | Magnetic | 425643 | 5849614 | A2 | - | - | - | 14 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70682 | Magnetic | 425500 | 5849633 | A2 | - | - | - | 11 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70683 | Magnetic | 425489 | 5850285 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70684 | Magnetic | 425148 | 5850043 | A2 | - | - | - | 20 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70685 | Magnetic | 425089 | 5850228 | A2 | - | - | - | 42 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70686 | Magnetic | 424644 | 5850275 | A2 | - | - | - | 55 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70687 | Magnetic | 424444 | 5848813 | A2 | - | - | - | 33 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70688 | Magnetic | 424071 | 5848790 | A2 | - | - | - | 42 | Small irregular anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70689 | Magnetic | 424052 | 5849094 | A2 | - | - | - | 33 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70690 | Magnetic | 423728 | 5850769 | A2 | - | - | - | 47 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70691 | Magnetic | 423713 | 5849164 | A2 | - | - | - | 139 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70692 | Bright reflector | 423667 | 5849174 | A2 | 4.4 | 3.0 | 0 | - | Circular bright reflector with a dark reflector in the centre. Identified within an area of megaripples, possibly a natural feature. | |
| 70693 | Magnetic | 423262 | 5850476 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70694 | Magnetic | 423235 | 5849551 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70695 | Magnetic | 423207 | 5849185 | A2 | - | - | - | 85 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70696 | Magnetic | 423104 | 5850773 | A2 | - | - | - | 16 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70697 | Magnetic | 422908 | 5850623 | A2 | - | - | - | 31 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70698 | Magnetic | 422890 | 5849463 | A2 | - | - | - | 15 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70699 | Magnetic | 422784 | 5849039 | A2 | - | - | - | 109 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70700 | Magnetic | 422571 | 5849429 | A2 | - | - | - | 224 | Large and distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70701 | Magnetic | 422490 | 5849054 | A2 | - | - | - | 28 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70702 | Magnetic | 422435 | 5849009 | A2 | - | - | - | 19 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70703 | Magnetic | 422290 | 5849776 | A2 | - | - | - | 22 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70704 | Wreck | 422267 | 5849082 | A1 | 26.0 | 7.0 | 2.0 | 117 | Wreckage of an unknown sailing vessel. Appears on the sonar data to be relatively intact though partially buried. Numerous short, straight dark reflectors with height. A medium sized wreck that is located within large sandwaves and thus difficult to distinguish in the bathymetry data. Appears to be aligned north-east to south-west and very little detail is visible - the wreck is mostly buried by sediments and the hull edge is difficult to see. Has a medium magnetic anomaly associated indicating a ferrous construction. This is an unknown wreck in the UKHO record which was last observed in 2014 as intact, mainly covered by a sandwave and measuring 46m x 8m x 2m. | 10545 (UKHO) |
| 70705 | Magnetic | 422091 | 5849938 | A2 | - | - | - | 42 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70706 | Magnetic | 422088 | 5849332 | A2 | - | - | - | 43 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70707 | Magnetic | 421931 | 5849407 | A2 | - | - | - | 40 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|-----------------------------|
| 70708 | Magnetic | 421831 | 5849489 | A2 | - | - | - | 58 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70709 | Wreck | 421671 | 5849182 | A1 | 153.0 | 38.0 | 10.2 | 10244 | Wreckage of steamship <i>Montferlan</i> . Identified on the bathymetry data as a distinct mound aligned north-east to south-west with scour to the south-west of the wreck. Bathymetry detail suggests that the wreck is upright with some debris to the north-east. Appears on the sonar data to be partially disintegrated, possibly broken up into sections, with a long distinct shadow. Numerous straight, sometimes slatted, sometimes square, dark reflectors identified. Feature has a very large associated magnetic anomaly. UKHO record states the original length was 128m. Last observed in 2014 with measurements of 160m x 34m x 7.7m. | 10549 (UKHO); 907461 (NRHE) |
| 70710 | Magnetic | 421494 | 5850694 | A2 | - | - | - | 59 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70711 | Magnetic | 421409 | 5849573 | A2 | - | - | - | 44 | Small symmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70712 | Magnetic | 421381 | 5850683 | A2 | - | - | - | 49 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70713 | Magnetic | 421210 | 5850816 | A2 | - | - | - | 77 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70714 | Magnetic | 421207 | 5849111 | A2 | - | - | - | 64 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70715 | Debris field | 421173 | 5849391 | A2 | 20.0 | 17.0 | 2.9 | 178 | A broad, elongated dark reflector with several straight dark reflectors jutting out from its edge. Feature appears to be partially buried. In the bathymetry data this is visible as a large and distinct mound that has a slight circular profile with one side steeper than the other. Identified on the magnetometer data as a medium asymmetric dipole indicating ferrous material. Possibly a debris field or a small, partially buried wreck. | |
| 70716 | Mound | 420995 | 5849159 | A2 | 18.5 | 7.0 | 0.6 | - | A medium sized mound within a depression, the depression measures 16m x 7m x -0.5m in the bathymetry data. In the sidescan data the feature is visible as a broad, slightly rounded dark reflector with a distinct, tapered shadow, with possible associated scour. Contact possibly sits within a slight depression. | |
| 70717 | Magnetic | 420991 | 5850668 | A2 | - | - | - | 41 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70718 | Magnetic | 420969 | 5850103 | A2 | - | - | - | 146 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70719 | Dark reflector | 420943 | 5849672 | A2 | 2.4 | 0.5 | 0.4 | - | Distinct but irregular dark reflector with height, appears to be in a slight zigzag. Object identified in an area of megaripples. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70720 | Magnetic | 420940 | 5850715 | A2 | - | - | - | 87 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70721 | Magnetic | 420927 | 5850593 | A2 | - | - | - | 51 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70722 | Magnetic | 420807 | 5849404 | A2 | - | - | - | 495 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70723 | Magnetic | 420768 | 5850761 | A2 | - | - | - | 100 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70724 | Magnetic | 420764 | 5850468 | A2 | - | - | - | 287 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70725 | Magnetic | 420754 | 5849207 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70726 | Magnetic | 420737 | 5850735 | A2 | - | - | - | 24 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70727 | Dark reflector | 420735 | 5850102 | A2 | 0.7 | 0.2 | 0.1 | - | Short, straight dark reflector with a very slight shadow. Identified in an area of megaripples. | |
| 70728 | Magnetic | 420530 | 5849111 | A2 | - | - | - | 112 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70729 | Magnetic | 420396 | 5849951 | A2 | - | - | - | 55 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70730 | Magnetic | 420316 | 5850327 | A2 | - | - | - | 56 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70731 | Magnetic | 420224 | 5849195 | A2 | - | - | - | 185 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70732 | Magnetic | 420032 | 5849147 | A2 | - | - | - | 41 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70733 | Magnetic | 419991 | 5850091 | A2 | - | - | - | 83 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70734 | Magnetic | 419974 | 5849184 | A2 | - | - | - | 238 | Large dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70735 | Debris field | 419825 | 5849775 | A2 | 26.0 | 12.0 | 2.5 | - | A large group of small dark reflectors with a distinct, jagged shadow. Identified in an area of megaripples and the full extent may be buried. In the bathymetry data this is visible as a large and distinct mound with scour to the east and north-east of the target. Possible debris field. | |
| 70736 | Magnetic | 419809 | 5849809 | A2 | - | - | - | 95 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70737 | Magnetic | 419665 | 5850149 | A2 | - | - | - | 72 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70738 | Magnetic | 419647 | 5850360 | A2 | - | - | - | 76 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|--------------------------------|
| 70739 | Magnetic | 419573 | 5850705 | A2 | - | - | - | 23 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70740 | Magnetic | 419534 | 5850533 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70741 | Magnetic | 419329 | 5850307 | A2 | - | - | - | 775 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70742 | Dark reflector | 419321 | 5849324 | A2 | 0.8 | 0.7 | 0.2 | - | Small round dark reflector with a short but distinct shadow. Possibly natural however looks anomalously round. | |
| 70743 | Magnetic | 419320 | 5850103 | A2 | - | - | - | 331 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70744 | Wreck | 419288 | 5849507 | A1 | 68.0 | 11.3 | 6.0 | 10181 | Large wreck that appears in the sonar data to be partially broken up with numerous straight dark reflectors and some slatted items. In the bathymetry data the wreck is visible as intact and lying upright on the edge of a large sandwave. The wreck is orientated north-east to south-west with scouring measuring 30m and orientated to the south-east. Associated wreck debris may be buried by sands. Wreck is identified on the magnetometer data as a very large magnetic anomaly indicating ferrous material. Associated UKHO record of an unknown wreck, last observed in 2014 measuring 60m x 10m x 4.1m. | 10548 (UKHO); 892271 (NRHE) |
| 70745 | Magnetic | 419265 | 5849383 | A2 | - | - | - | 25 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70746 | Magnetic | 419150 | 5849325 | A2 | - | - | - | 138 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70747 | Magnetic | 419125 | 5851125 | A2 | - | - | - | 24 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70748 | Magnetic | 419071 | 5850689 | A2 | - | - | - | 84 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70749 | Magnetic | 419066 | 5851187 | A2 | - | - | - | 37 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70750 | Dark reflector | 419064 | 5850541 | A2 | 1.8 | 0.3 | 0.2 | - | Elongated dark reflector with a distinct shadow. | |
| 70751 | Magnetic | 419015 | 5849935 | A2 | - | - | - | 75 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70752 | Magnetic | 419009 | 5849664 | A2 | - | - | - | 146 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70753 | Dark reflector | 418931 | 5849803 | A2 | 0.9 | 0.2 | 0.2 | - | Small, dark reflector with a distinct shadow which appears to extend out beyond the contact. Some possible associated scour. | |
| 70754 | Dark reflector | 418930 | 5849791 | A2 | 2.0 | 0.4 | 0.4 | - | Small dark reflector with a distinct, rounded, relatively broad shadow. Some possible associated scour. | |
| 70755 | Magnetic | 418916 | 5850637 | A2 | - | - | - | 63 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70756 | Magnetic | 418884 | 5849422 | A2 | - | - | - | 24 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70757 | Magnetic | 418523 | 5850069 | A2 | - | - | - | 41 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70758 | Magnetic | 418379 | 5850671 | A2 | - | - | - | 250 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70759 | Magnetic | 418305 | 5850967 | A2 | - | - | - | 382 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70760 | Magnetic | 418276 | 5850891 | A2 | - | - | - | 38 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70761 | Magnetic | 418101 | 5850986 | A2 | - | - | - | 184 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70762 | Magnetic | 418059 | 5850991 | A2 | - | - | - | 236 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70763 | Magnetic | 417939 | 5849439 | A2 | - | - | - | 49 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70764 | Magnetic | 417769 | 5849397 | A2 | - | - | - | 32 | Small anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70765 | Magnetic | 417414 | 5851081 | A2 | - | - | - | 105 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70766 | Magnetic | 417339 | 5850021 | A2 | - | - | - | 55 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70767 | Magnetic | 416973 | 5850755 | A2 | - | - | - | 91 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70768 | Magnetic | 416881 | 5849985 | A2 | - | - | - | 11 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70769 | Magnetic | 416815 | 5849811 | A2 | - | - | - | 71 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70770 | Magnetic | 416536 | 5851027 | A2 | - | - | - | 143 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70771 | Magnetic | 416273 | 5849462 | A2 | - | - | - | 26 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70772 | Magnetic | 416270 | 5849491 | A2 | - | - | - | 30 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70773 | Magnetic | 416231 | 5851312 | A2 | - | - | - | 799 | Large dipole anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70774 | Magnetic | 416223 | 5849757 | A2 | - | - | - | 96 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70775 | Magnetic | 416096 | 5851067 | A2 | - | - | - | 35 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70776 | Magnetic | 416077 | 5851249 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70777 | Magnetic | 415948 | 5851087 | A2 | - | - | - | 15 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70778 | Magnetic | 415790 | 5851270 | A2 | - | - | - | 29 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70779 | Magnetic | 415763 | 5849825 | A2 | - | - | - | 48 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70780 | Dark reflector | 415670 | 5850820 | A2 | 1.2 | 0.3 | 0.2 | - | Elongated dark reflector with a distinct, slightly irregular shadow. | |
| 70781 | Magnetic | 415655 | 5850729 | A2 | - | - | - | 36 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70782 | Debris field | 415394 | 5849528 | A2 | 9.9 | 0.4 | 1.1 | 260 | Small patch of disturbed seafloor. Possibly several small objects with height piled up. Interpreted as being a small debris field. Associated large magnetic anomaly suggests ferrous debris. | |
| 70783 | Magnetic | 415373 | 5851454 | A2 | - | - | - | 60 | Medium negative monopole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70784 | Debris | 415366 | 5849564 | A1 | 0.8 | 0.6 | 0.8 | 1113 | Distinct dark reflector with an irregular shadow. Other similar but smaller contacts identified nearby. Possibly part of nearby debris field (70785). Has a very large magnetic contact associated indicating ferrous debris | |
| 70785 | Debris field | 415354 | 5849572 | A1 | 10.8 | 2.4 | 1.3 | 1113 | Small patch of disturbed seafloor comprised numerous dark reflectors with height. Very large monopole identified on the magnetometer data indicating ferrous material. Possible small debris field. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70786 | Magnetic | 415318 | 5850961 | A2 | - | - | - | 71 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70787 | Magnetic | 415303 | 5851388 | A2 | - | - | - | 78 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70788 | Magnetic | 415281 | 5851195 | A2 | - | - | - | 36 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70789 | Magnetic | 415184 | 5849952 | A2 | - | - | - | 184 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70790 | Magnetic | 415045 | 5850663 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70791 | Mound | 415020 | 5849973 | A2 | 9.1 | 1.1 | 1.2 | - | Small patch of dark reflector, not particularly distinct, but with a clear shadow and some possible scour. Possibly natural however looks a little anomalous. Identified as a small mound on the bathymetry data. | |
| 70792 | Magnetic | 414893 | 5850619 | A2 | - | - | - | 40 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70793 | Magnetic | 414871 | 5850387 | A2 | - | - | - | 22 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70794 | Dark reflector | 414866 | 5849913 | A2 | 1.8 | 1.6 | 0.7 | - | Broad, slightly irregular dark reflector with a distinct shadow. Possibly several objects close together. May be a natural feature. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70795 | Magnetic | 414746 | 5850304 | A2 | - | - | - | 35 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70796 | Magnetic | 414654 | 5850537 | A2 | - | - | - | 58 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70797 | Magnetic | 414371 | 5850803 | A2 | - | - | - | 76 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70798 | Dark reflector | 414339 | 5850340 | A2 | 1.0 | 0.1 | 0.3 | - | Small dark reflector with a distinct shadow. Bright reflector at the front of the contact, possibly related. | |
| 70799 | Magnetic | 414289 | 5850975 | A2 | - | - | - | 53 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70800 | Magnetic | 414188 | 5850981 | A2 | - | - | - | 20 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70801 | Magnetic | 414181 | 5849933 | A2 | - | - | - | 172 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70802 | Magnetic | 414007 | 5851075 | A2 | - | - | - | 217 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70803 | Magnetic | 413984 | 5851304 | A2 | - | - | - | 97 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70804 | Magnetic | 413882 | 5851313 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 70805 | Magnetic | 413875 | 5851575 | A2 | - | - | - | 15 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70806 | Magnetic | 413857 | 5849835 | A2 | - | - | - | 51 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70807 | Magnetic | 413733 | 5851587 | A2 | - | - | - | 11 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70808 | Magnetic | 413700 | 5851069 | A2 | - | - | - | 79 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70809 | Wreck | 413550 | 5850143 | A1 | 47.0 | 18.0 | 7.6 | 1779 | Wreck of steam paddle schooner <i>Seagull</i> . The wreck is orientated in a NW - SE direction. Wreck appears to be partially disintegrated on the sonar data with numerous straight dark reflectors and a broad, irregular shadow. In the bathymetry data the wreck appears intact and upright on a sandwave rich area of the seabed, again some superstructure is discernible in the data. Wreck is identified on the magnetometer data as a large asymmetrical dipole. The UKHO record states that the original dimensions were 52.1m x 7m. This wreck was last observed in 1994 by divers, who measured the length as 40m and the height as 8.6m. | 10550 (UKHO); 892272 (NRHE) |
| 70810 | Debris field | 413518 | 5850156 | A1 | 8.0 | 3.3 | 0.4 | - | Small patch of disturbed seafloor with some possible straight features with height, however nothing is clearly discernible. Possible debris associated with the wreck 70809 | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70811 | Magnetic | 413517 | 5850235 | A2 | - | - | - | 81 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70812 | Magnetic | 413491 | 5851668 | A2 | - | - | - | 110 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70813 | Magnetic | 413294 | 5851181 | A2 | - | - | - | 74 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70814 | Magnetic | 413256 | 5849895 | A2 | - | - | - | 69 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70815 | Magnetic | 413243 | 5849961 | A2 | - | - | - | 75 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70816 | Debris | 413210 | 5850774 | A2 | 8.3 | 0.4 | 0.1 | - | Short curvilinear dark reflector with a slight shadow. Possible item of debris however not particularly distinct. | |
| 70817 | Magnetic | 413169 | 5849901 | A2 | - | - | - | 67 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70818 | Dark reflector | 412926 | 5850034 | A2 | 0.8 | 0.7 | 0.5 | - | Relatively indistinct, straight dark reflector with a relatively broad shadow. Possibly a natural feature. | |
| 70819 | Magnetic | 412731 | 5850815 | A2 | - | - | - | 36 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70820 | Magnetic | 412715 | 5851475 | A2 | - | - | - | 301 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70821 | Magnetic | 412714 | 5851035 | A2 | - | - | - | 30 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70822 | Magnetic | 412605 | 5849769 | A2 | - | - | - | 69 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70823 | Debris | 412557 | 5850455 | A2 | 82.7 | 0.9 | 0.4 | 110 | Long, straight linear item of debris with height identified on the sonar data. Feature correlates with a medium asymmetric dipole identified on the magnetometer data indicating ferrous debris. | |
| 70824 | Magnetic | 412502 | 5850689 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70825 | Magnetic | 412445 | 5851504 | A2 | - | - | - | 158 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70826 | Magnetic | 412413 | 5849863 | A2 | - | - | - | 36 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70827 | Magnetic | 412322 | 5850037 | A2 | - | - | - | 53 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70828 | Magnetic | 412261 | 5850645 | A2 | - | - | - | 52 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70829 | Dark reflector | 412242 | 5849928 | A2 | 2.7 | 0.1 | 0.2 | - | Faint, straight, elongated dark reflector with a slight shadow. | |
| 70830 | Magnetic | 412230 | 5850469 | A2 | - | - | - | 88 | Medium distinct negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70831 | Dark reflector | 412223 | 5849946 | A2 | 2.3 | 0.8 | 0.3 | - | Distinct, straight elongated dark reflector with a broad shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|-----------------------------|
| 70832 | Debris | 412148 | 5850351 | A1 | 1.6 | 0.3 | 0.5 | - | Small dark reflector, not particularly distinct, identified towards the bow of wreck 70834. Likely to be items of debris associated with wreck. | |
| 70833 | Debris | 412143 | 5850353 | A1 | 0.9 | 0.6 | 0.6 | - | Small dark reflector identified at the bow of a wreck. Partially obscured by the wreck shadow. Possible similar debris identified nearby (70832). Likely to be items of debris associated to wreck 70834. | |
| 70834 | Wreck | 412105 | 5850354 | A1 | 66.0 | 12.8 | 6.4 | 147 | Wreck of the steam screw barque <i>Xanthe</i> (UKHO) sunk in 1869. Identified on the sonar data as a distinct, upright wreck. Wreck appears to be relatively intact, with some possible straight deck features and some associated items of debris. In the bathymetry data the wreck consists of one distinct target aligned east to west, lying on the seabed at a depth of 29m. Wreck is identified on the magnetometer data as a medium magnetic anomaly. UKHO record states that the original dimensions were 62.2m x 8.5m x 4.9m and that the wreck was last observed in 2002, with dimensions of 55m x 10m x 7m. | 10660 (UKHO); 892273 (NRHE) |
| 70835 | Magnetic | 411891 | 5850871 | A2 | - | - | - | 66 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70836 | Magnetic | 411629 | 5850952 | A2 | - | - | - | 49 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70837 | Rope/chain | 411622 | 5850101 | A2 | 67.1 | 1.1 | 0.3 | 64 | Long and reasonably straight linear dark reflector with slight height. Possible rope or chain. Has a medium magnetic anomaly associated indicating ferrous debris. | |
| 70838 | Rope/chain | 411607 | 5850260 | A2 | 128.2 | 0.4 | 0.4 | - | Long and thin curvilinear dark reflector with slight height. Possible rope/chain, feature curves round in a loop at one end. | |
| 70839 | Rope/chain | 411475 | 5850313 | A2 | 105.3 | 0.5 | 0.5 | 35 | A long, thin and curvilinear dark reflector with a slight shadow, likely long length of rope or chain. Has a small magnetic anomaly associated indicating ferrous debris. | |
| 70840 | Magnetic | 411359 | 5850463 | A2 | - | - | - | 308 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70841 | Magnetic | 411189 | 5850739 | A2 | - | - | - | 327 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70842 | Magnetic | 411177 | 5850603 | A2 | - | - | - | 662 | Large negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70843 | Magnetic | 411154 | 5850789 | A2 | - | - | - | 40 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70844 | Debris | 411081 | 5851344 | A2 | 7.1 | 0.4 | 0 | - | Short, narrow curvilinear bright reflector identified in an area of rippled seabed. | |
| 70845 | Magnetic | 410999 | 5851831 | A2 | - | - | - | 44 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70846 | Magnetic | 410993 | 5850260 | A2 | - | - | - | 39 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70847 | Debris | 410940 | 5851086 | A2 | 35.3 | 0.4 | 0.4 | - | Relatively straight linear item of debris, orientated east - west, with an irregular, intermittent shadow. Identified in an area of textured seafloor. | |
| 70848 | Magnetic | 410900 | 5850242 | A2 | - | - | - | 63 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70849 | Magnetic | 410851 | 5851515 | A2 | - | - | - | 33 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70850 | Magnetic | 410795 | 5851571 | A2 | - | - | - | 38 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70851 | Magnetic | 410762 | 5850475 | A2 | - | - | - | 95 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70852 | Magnetic | 410694 | 5849930 | A2 | - | - | - | 40 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70853 | Magnetic | 410575 | 5851709 | A2 | - | - | - | 48 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70854 | Magnetic | 410573 | 5851587 | A2 | - | - | - | 61 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70855 | Magnetic | 410464 | 5851920 | A2 | - | - | - | 67 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70856 | Rope/chain | 410452 | 5851174 | A2 | 43.4 | 0.3 | 0.2 | 94 | Long length of a slightly curvilinear dark reflector with a slight shadow. Possible rope or chain. Has a medium magnetic anomaly associated indicating ferrous debris. | |
| 70857 | Magnetic | 410399 | 5851420 | A2 | - | - | - | 46 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70858 | Magnetic | 410367 | 5850127 | A2 | - | - | - | 206 | Large dipolar anomaly only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 70859 | Magnetic | 410341 | 5851681 | A2 | - | - | - | 43 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70860 | Magnetic | 410327 | 5849961 | A2 | - | - | - | 134 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 70861 | Magnetic | 410266 | 5850427 | A2 | - | - | - | 26 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 70862 | Magnetic | 410254 | 5851569 | A2 | - | - | - | 62 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70863 | Debris field | 410221 | 5851797 | A2 | 29.9 | 12.8 | 0.9 | 40 | Small patch of disturbed seafloor. Appears to be slightly darker reflector with some objects with height. Has a small magnetic anomaly associated indicating ferrous debris. | |
| 70864 | Magnetic | 410145 | 5850132 | A2 | - | - | - | 84 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70865 | Magnetic | 410080 | 5850090 | A2 | - | - | - | 79 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70866 | Magnetic | 410048 | 5851912 | A2 | - | - | - | 70 | Medium anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70867 | Magnetic | 409983 | 5851893 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70868 | Magnetic | 409858 | 5851319 | A2 | - | - | - | 170 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70869 | Magnetic | 409809 | 5850446 | A2 | - | - | - | 198 | Medium asymmetric dipole Identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70870 | Magnetic | 409231 | 5851189 | A2 | - | - | - | 415 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70871 | Rope/chain | 409224 | 5851490 | A2 | 27.9 | 0.3 | 0.2 | - | Short, relatively straight linear item of debris possibly with a slight shadow. Not particularly distinct. | |
| 70872 | Magnetic | 409102 | 5850383 | A2 | - | - | - | 81 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70873 | Magnetic | 408920 | 5850554 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70874 | Rope/chain | 408842 | 5850853 | A2 | 71.8 | 0.2 | 0.2 | - | Curvilinear item of debris with a slight shadow. Possible rope or chain. | |
| 70875 | Dark reflector | 408818 | 5851046 | A2 | 3.7 | 1.5 | 0.4 | - | Small round dark reflector with a brighter reflector in the centre and a distinct, irregular shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70876 | Magnetic | 408780 | 5850544 | A2 | - | - | - | 48 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70877 | Magnetic | 408775 | 5851203 | A2 | - | - | - | 154 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70878 | Magnetic | 408658 | 5852225 | A2 | - | - | - | 25 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70879 | Magnetic | 408520 | 5852354 | A2 | - | - | - | 37 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70880 | Magnetic | 408487 | 5852290 | A2 | - | - | - | 114 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 70881 | Debris | 408481 | 5850795 | A2 | 2.5 | 1.9 | 0.5 | 241 | Small, circular dark reflector with a bright reflector in the centre with a broad distinct shadow. Has a large magnetic anomaly associated indicating ferrous debris | |
| 70882 | Magnetic | 408463 | 5852212 | A2 | - | - | - | 29 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70883 | Debris | 408450 | 5850815 | A2 | 8.1 | 0.2 | 0.2 | - | Short, straight linear item of debris curved round in a 'v', or possibly two objects close together. | |
| 70884 | Dark reflector | 408420 | 5850627 | A2 | 3.1 | 2.4 | 0.6 | - | Dark circular dark reflector with a bright reflector in the centre and a distinct shadow. Some slight disturbance to surrounding sediment. | |
| 70885 | Magnetic | 408400 | 5850489 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70886 | Magnetic | 408392 | 5851348 | A2 | - | - | - | 33 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70887 | Magnetic | 408380 | 5851461 | A2 | - | - | - | 87 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70888 | Debris | 408377 | 5851568 | A2 | 1.8 | 1.7 | 0.5 | 54 | Small, round dark reflector with a bright reflector in the centre in a depression. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 70889 | Magnetic | 408357 | 5850798 | A2 | - | - | - | 53 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70890 | Magnetic | 408348 | 5851600 | A2 | - | - | - | 77 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70891 | Magnetic | 408329 | 5852368 | A2 | - | - | - | 90 | Medium distinctive dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70892 | Dark reflector | 408288 | 5851095 | A2 | 7.8 | 1.2 | 0.5 | - | Narrow dark reflector in a 'V' shape with a slight shadow. Looks a little irregular, may also be a slightly triangular object. | |
| 70893 | Dark reflector | 408269 | 5850876 | A2 | 5.8 | 0.9 | 0.8 | - | Straight dark reflector with a broad, distinct shadow. Object appears to be slightly rectangular | |
| 70894 | Magnetic | 408265 | 5852699 | A2 | - | - | - | 692 | Large dipole anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70895 | Magnetic | 408253 | 5850701 | A2 | - | - | - | 46 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70896 | Magnetic | 408216 | 5850658 | A2 | - | - | - | 238 | Large asymmetric dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70897 | Mound | 408208 | 5851780 | A2 | 5.0 | 3.4 | 1.4 | - | Distinct dark reflector within a slight depression with a relatively broad shadow. Visible in the bathymetry as a distinct mound in the centre of a slight depression or scour measuring 17 m x 14 m x 0.6 m. | |
| 70898 | Magnetic | 408186 | 5850687 | A2 | - | - | - | 313 | Large asymmetric dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70899 | Dark reflector | 408170 | 5850847 | A2 | 4.4 | 1.9 | 1.1 | - | Distinct, 'v' shape dark reflector with a distinct, tapered shadow. Some disturbance to surrounding seabed. | |
| 70900 | Debris | 408162 | 5850457 | A2 | 8.7 | 1.7 | 1.2 | - | A broken up or partially buried piece of debris, the feature has two distinct circular dark reflectors with shadows and a short curvilinear linear dark reflector with height coming from this. | |
| 70901 | Dark reflector | 408137 | 5851136 | A2 | 3.3 | 0.9 | 0.7 | - | Distinct dark reflector with a broad, slightly angular shadow. | |
| 70902 | Magnetic | 408094 | 5852138 | A2 | - | - | - | 34 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70903 | Magnetic | 408061 | 5851869 | A2 | - | - | - | 103 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70904 | Magnetic | 408025 | 5851490 | A2 | - | - | - | 220 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70905 | Dark reflector | 408005 | 5851031 | A2 | 1.6 | 1.5 | 0.3 | - | Small, circular dark reflector with a bright reflector in the centre with a distinct curved shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70906 | Magnetic | 407965 | 5852058 | A2 | - | - | - | 26 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70907 | Magnetic | 407771 | 5851284 | A2 | - | - | - | 42 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70908 | Magnetic | 407756 | 5852353 | A2 | - | - | - | 54 | Medium distinctive dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70909 | Magnetic | 407724 | 5850649 | A2 | - | - | - | 45 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70910 | Magnetic | 407667 | 5852948 | A2 | - | - | - | 57 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70911 | Magnetic | 407640 | 5853077 | A2 | - | - | - | 92 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70912 | Magnetic | 407639 | 5851465 | A2 | - | - | - | 41 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70913 | Rope/chain | 407630 | 5853193 | A2 | 92.7 | 0.8 | 0.4 | 305 | Curvilinear dark reflector with slight height possibly split apart or partially buried across its extent. Possible rope or chain orientated north-west to south-east on a relatively flat and even area of the seabed. Has a large magnetic anomaly associated indicating ferrous debris. | |
| 70914 | Magnetic | 407630 | 5852981 | A2 | - | - | - | 117 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70915 | Mound | 407613 | 5852594 | A2 | 16.0 | 15.0 | 1.9 | 128 | Large, rounded, poorly defined dark reflector with a broad, long shadow. In the bathymetry data this is visible as a large circular mound. Has a large medium magnetic anomaly associated indicating ferrous debris is contained | |
| 70916 | Dark reflector | 407518 | 5851012 | A2 | 2.6 | 0.7 | 0.6 | - | An irregularly shaped thin dark reflector, relatively straight and with a fairly broad shadow. | |
| 70917 | Magnetic | 407474 | 5853234 | A2 | - | - | - | 54 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70918 | Magnetic | 407469 | 5852212 | A2 | - | - | - | 154 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70919 | Dark reflector | 407440 | 5851807 | A2 | 4.1 | 0.5 | 0.5 | - | Dark reflector with a broad, distinct shadow. Looks quite large however image likely distorted by movement of sonar fish. | |
| 70920 | Magnetic | 407407 | 5850803 | A2 | - | - | - | 37 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70921 | Rope/chain | 407326 | 5851962 | A2 | 69.9 | 0.5 | 0.1 | 31 | Faint linear dark reflector, curved into a 'v' shape with a rounded joint, with a slight shadow, possibly rope or chain. Has a small magnetic anomaly associated indicating ferrous debris. | |
| 70922 | Magnetic | 407291 | 5851104 | A2 | - | - | - | 193 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 70923 | Dark reflector | 407269 | 5851868 | A2 | 1.8 | 1.5 | 0.4 | - | Small, circular dark reflector with a bright reflector in the centre with a distinct shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70924 | Magnetic | 407269 | 5851069 | A2 | - | - | - | 43 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70925 | Dark reflector | 407266 | 5851035 | A2 | 2.4 | 0.9 | 0.6 | - | Faint dark reflector with a distinct, broad shadow. | |
| 70926 | Magnetic | 407211 | 5853274 | A2 | - | - | - | 25 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70927 | Magnetic | 407206 | 5850855 | A2 | - | - | - | 228 | Large positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70928 | Dark reflector | 407187 | 5851658 | A2 | 6.4 | 1.5 | 0.4 | - | Narrow elongated dark reflector with a broad distinct shadow. Object extends out with a very slight shadow. | |
| 70930 | Magnetic | 407157 | 5851175 | A2 | - | - | - | 22 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70931 | Magnetic | 407156 | 5851314 | A2 | - | - | - | 26 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70932 | Rope/chain | 407100 | 5851063 | A2 | 9.3 | 0.5 | 0.2 | - | Relatively short linear dark reflector with a slight shadow. Possible rope or chain identified in a relatively featureless area of seafloor. | |
| 70933 | Magnetic | 407047 | 5852501 | A2 | - | - | - | 161 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|--------------------------------|
| 70934 | Wreck | 406929 | 5852021 | A1 | 105.0 | 46.4 | 1.9 | 1056 | Large wreck visible as numerous small objects with height, some of which are quite straight. No distinguishable structural elements are visible and it appears badly degraded, though still with some height. The wreck is orientated north to south on a relatively flat and even area of the seabed. In the bathymetry data this wreck is visible as mostly buried and broken up and situated in a depression. Has a very large magnetic anomaly associated indicating a ferrous construction. UKHO record 10554 states this is the <i>Sheaf Water</i> , a steamship torpedoed by a German E-Boat in 1942 with original dimensions of 97.5m x 13.1m. Previously identified in 2002 with dimensions as 110m x 25m x 2m. | 10554 (UKHO); 907463 (NRHE) |
| 70935 | Debris | 406866 | 5852138 | A2 | 4.3 | 3.3 | 1.4 | - | A triangular dark reflector with a distinct dark reflector at the front with a distinct, narrow shadow. Possible debris, located 80 m from dispersed wreck (70934) | |
| 70936 | Bright reflector | 406791 | 5851618 | A2 | 7.1 | 0.1 | 0 | - | Straight, elongated bright reflector. Possibly a shadow with no discernible contact. | |
| 70937 | Dark reflector | 406764 | 5852637 | A2 | 4.7 | 0.5 | 0.3 | - | Short straight distinct dark reflector with a broad shadow. | |
| 70938 | Magnetic | 406737 | 5852583 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70939 | Dark reflector | 406699 | 5852290 | A2 | 4.2 | 0.9 | 0.4 | - | Straight, distinct dark reflector, which bends round slightly at one end, with a broad shadow. Object possibly distorted by movement of the sonar fish. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70940 | Magnetic | 406685 | 5851341 | A2 | - | - | - | 86 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70941 | Bright reflector | 406611 | 5852664 | A2 | 6.5 | 0.7 | 0 | - | Short, straight narrow bright reflector identified in an isolated area of seafloor. | |
| 70942 | Magnetic | 406605 | 5852642 | A2 | - | - | - | 358 | Large anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70943 | Dark reflector | 406587 | 5852212 | A2 | 4.3 | 1.4 | 0.3 | - | Small, circular dark reflector with a bright reflector in the centre and a distinct shadow. | |
| 70944 | Magnetic | 406561 | 5851181 | A2 | - | - | - | 38 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70945 | Magnetic | 406516 | 5851497 | A2 | - | - | - | 37 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70946 | Rope/chain | 406463 | 5853677 | A2 | 65.1 | 0.4 | 0.3 | - | Relatively straight linear dark reflector with a shadow on a flat and even area of the seabed, possible rope or chain. | |
| 70947 | Magnetic | 406445 | 5851623 | A2 | - | - | - | 59 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70948 | Debris field | 406424 | 5852262 | A2 | 31.0 | 31.0 | -0.7 | 386 | Slightly diamond shaped debris field comprising bright reflectors with a dark reflector running through the centre. Possible scour. In the bathymetry data this is visible as a large depression with slight mound in the centre. Has a large magnetic anomaly associated indicating ferrous debris. | |
| 70949 | Seafloor disturbance | 406349 | 5851117 | A2 | 7.5 | 6.5 | 0.5 | - | A few short, straight dark reflectors with a slight shadow, possibly partially buried by sandy sediments. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 70950 | Magnetic | 406261 | 5851245 | A2 | - | - | - | 45 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70951 | Magnetic | 406216 | 5852461 | A2 | - | - | - | 51 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70952 | Rope/chain | 406176 | 5852858 | A2 | 98.2 | 0.6 | 0.3 | - | A long straight and narrow linear dark reflector with a slight shadow, possible rope or chain associated or caught on wreck (70962). | |
| 70953 | Magnetic | 406141 | 5851570 | A2 | - | - | - | 65 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70954 | Wreck | 406125 | 5853694 | A1 | 73.2 | 29.6 | 5.1 | 12104 | Large wreck that appears to be mostly intact. It has numerous dark reflectors, some of which are quite straight and have long, distinct shadows. These may be deck structure visible in the sidescan sonar data. The vessel has a large height measurement and is orientated north-east to south-west on a relatively flat and even area of the seabed. In the bathymetry data this wreck appears upright with a distinct area of scour orientated south-east and a depth of 1m below the seabed. There does not appear to be any outlying debris visible. There is a very large magnetic anomaly associated indicating a ferrous construction. Associated with UKHO record 10680 of unknown wreck. Last observed with dimensions 80m x 20m x 4m in 1983. | 10680 (UKHO); 892279 (NRHE) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70955 | Rope/chain | 406125 | 5852888 | A2 | 14.2 | 0.6 | 0.1 | - | Short and straight curvilinear item of debris with slight height, possibly a rope or chain. Identified close to similar linear feature and wreck (70962). | |
| 70956 | Rope/chain | 406096 | 5852907 | A2 | 82.9 | 1.1 | 0.2 | - | Very long, relatively straight and narrow dark reflector with slight height. Possibly fishing gear attached to wreck 70962. | |
| 70957 | Magnetic | 406089 | 5853496 | A2 | - | - | - | 12 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70958 | Debris field | 406085 | 5852987 | A1 | 44.4 | 19.2 | 0.2 | - | Large patch of a dispersed dark reflectors with height. Approximately four anomalies, one thin linear dark reflector and smaller anomalies. Located directly next to wreck 70962 and likely associated debris | |
| 70959 | Rope/chain | 406077 | 5853046 | A2 | 33.1 | 0.4 | 0.3 | - | Faint curvilinear dark reflector with slight height, possible rope or chain associated with nearby wreck (70962). | |
| 70960 | Rope/chain | 406070 | 5853720 | A2 | 70.1 | 0.4 | 0.1 | - | Long and thin linear dark reflector identified close to wreck. Possibly related rope or chain or modern material snagged on the wreck (70954). | |
| 70961 | Magnetic | 406069 | 5851369 | A2 | - | - | - | 168 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|--------------------------------|
| 70962 | Wreck | 406058 | 5852977 | A1 | 107.0 | 43.5 | 4.0 | 30656 | A large area of dispersed wreck, visible as numerous dark reflectors, some of which are quite straight, with distinct broad shadows which may be deck structure. Parts of the hull outer edge appear intact. The wreck has a debris field (70958) and possible rope or chain features in close proximity (70952, 70955, 70956 and 70959). The wreck is orientated north to south. In the bathymetry data this wreck is recorded with a general seabed depth of 14m and is visible as one distinct target with one high point at the northern end. Has a large magnetic anomaly associated indicating a ferrous construction. In the UKHO database this is recorded as <i>Fulgens</i> , a steamship built in 1912 with dimensions of 93.1m x 12.9m and sunk in 1915 by torpedo. | 10556 (UKHO); 907465 (NRHE) |
| 70963 | Magnetic | 406046 | 5851855 | A2 | - | - | - | 109 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70964 | Magnetic | 406037 | 5852080 | A2 | - | - | - | 29 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70965 | Debris field | 405986 | 5853162 | A2 | 29.0 | 15.0 | 0.7 | 345 | Small patch of objects with height with distinct shadows, possible debris field. In the bathymetry data this is visible as a depression (-0.8 m) with slight mound in the centre on a slope. Has a large magnetic anomaly associated indicating ferrous debris | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70966 | Magnetic | 405904 | 5854081 | A2 | - | - | - | 56 | Medium symmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70967 | Dark reflector | 405903 | 5851454 | A2 | 7.8 | 0.4 | 0.2 | - | Straight, narrow, distinct dark reflector with slightly curved shadow. | |
| 70968 | Magnetic | 405841 | 5852185 | A2 | - | - | - | 58 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70969 | Rope/chain | 405828 | 5852225 | A2 | 67.2 | 0.4 | 0.2 | - | A long, thin and faint linear dark reflector with associated dark reflector. Feature appears to be in a relatively broad 'v' shape. Object on end of possible rope or chain measures 2.3m x 1.8m x 0.8m. | |
| 70970 | Magnetic | 405824 | 5851595 | A2 | - | - | - | 131 | Medium distinctive dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70971 | Dark reflector | 405778 | 5851519 | A2 | 12.4 | 0.7 | 0.4 | - | Long, thin and straight, poorly defined dark reflector with a distinct shadow. | |
| 70972 | Rope/chain | 405726 | 5851715 | A2 | 56.7 | 0.3 | 0.4 | - | Linear dark reflector with a very slight shadow, possibly rope or chain although may just be a scar. Has a UKHO record (10553 - British fishing vessel <i>Nikki</i>) 13m to the north-east but no visible remains. | 10553 (UKHO) |
| 70973 | Magnetic | 405678 | 5852003 | A2 | - | - | - | 28 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70974 | Rope/chain | 405662 | 5853148 | A2 | 46.0 | 0.7 | 0.3 | - | Straight, linear item of debris with a slight shadow identified in a relatively featureless area of seafloor, possible rope or chain. | |
| 70975 | Magnetic | 405458 | 5852406 | A2 | - | - | - | 615 | Large anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70976 | Dark reflector | 405441 | 5851506 | A2 | 3.1 | 0.2 | 0.2 | - | Very slight dark reflector, not particularly distinct, with a broad shadow. | |
| 70977 | Magnetic | 405438 | 5852011 | A2 | - | - | - | 107 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70978 | Debris | 405427 | 5851976 | A2 | 4.8 | 2.5 | 1.6 | 34 | Straight, but relatively indistinct dark reflector but with a clearly defined shadow. Shadow appears to be slightly square with a dark reflector in the centre. Has a small magnetic anomaly associated indicating ferrous debris | |
| 70979 | Dark reflector | 405401 | 5852664 | A2 | 4.1 | 0.9 | 0.7 | - | Distinct long and slightly curvilinear dark reflector with a distinct jagged shadow. Other, smaller objects identified in the surrounding area. | |
| 70980 | Magnetic | 405370 | 5851605 | A2 | - | - | - | 36 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70981 | Debris field | 405293 | 5852497 | A2 | 22.7 | 11.9 | 1.0 | - | Distinct slightly rounded dark reflector with a broad shadow within a small debris field or seafloor disturbance with some large objects with height. In the bathymetry data this is visible as three slightly distinct mounds in a circular arrangement on a relatively flat and even area of the seabed, slightly more distinct than surrounding features | |
| 70982 | Magnetic | 405215 | 5853665 | A2 | - | - | - | 25 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70983 | Magnetic | 405183 | 5851919 | A2 | - | - | - | 64 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 70984 | Dark reflector | 405155 | 5851768 | A2 | 1.9 | 1.8 | 0.8 | - | Straight dark reflector, slightly triangular with a long, narrow shadow. | |
| 70985 | Dark reflector | 405133 | 5851794 | A2 | 2.0 | 1.7 | 0.8 | - | Faint dark reflector, slightly triangular, with a long, narrow shadow. | |
| 70986 | Dark reflector | 405110 | 5851766 | A2 | 6.5 | 0.4 | 0.2 | - | Long and straight dark reflector, not particularly distinct, with a slight shadow. | |
| 70987 | Bright reflector | 405062 | 5852152 | A2 | 5.7 | 0.5 | 0 | - | Straight and narrow bright reflector. Not particularly distinct feature. | |
| 70988 | Rope/chain | 405057 | 5853805 | A2 | 31.9 | 0.3 | 0.2 | - | Short, slightly angular linear item of debris with height. Similar linear feature identified nearby. Possibly joined and partially buried, or split in two parts, may be rope or chain. Individually features measure 13.6m x 5.5m. | |
| 70989 | Rope/chain | 405000 | 5852448 | A2 | 38.0 | 0.3 | 0.2 | - | Dark, linear feature with a slight shadow. Possible rope or chain. | |
| 70990 | Bright reflector | 404986 | 5851814 | A2 | 3.8 | 2.1 | 0 | - | Bright, straight 'V' shaped object identified. | |
| 70991 | Magnetic | 404900 | 5852184 | A2 | - | - | - | 27 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70992 | Magnetic | 404887 | 5853971 | A2 | - | - | - | 42 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70993 | Rope/chain | 404788 | 5851740 | A2 | 64.8 | 0.3 | 0.1 | 157 | Faint, narrow linear item of debris with a very slight shadow. Possible rope or chain. Has a medium dipole anomaly associated indicating a ferrous composition. | |
| 70994 | Magnetic | 404787 | 5853518 | A2 | - | - | - | 39 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 70995 | Debris | 404710 | 5851809 | A2 | 5.6 | 0.2 | 0 | 88 | Small narrow, but relatively distinct dark reflector with no discernible height. Feature appears to have some slight associated scour. Has a medium dipole anomaly associated indicating ferrous debris | |
| 70996 | Magnetic | 404661 | 5854180 | A2 | - | - | - | 75 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 70997 | Dark reflector | 404657 | 5852481 | A2 | 6.8 | 0.4 | 0.3 | - | Straight dark reflector with a distinct shadow. | |
| 70998 | Dark reflector | 404649 | 5852896 | A2 | 6.1 | 0.4 | 0.2 | - | Straight narrow dark reflector with a distinct, relatively broad shadow. Similar feature identified nearby, possibly part of a longer, partially buried, linear feature (70999). | |
| 70999 | Dark reflector | 404635 | 5852909 | A2 | 9.9 | 0.2 | 0.2 | - | Straight narrow dark reflector with a distinct, relatively broad shadow. Similar feature identified nearby, possibly a longer, partially buried, linear feature (70998). | |
| 71000 | Dark reflector | 404575 | 5853973 | A2 | 3.6 | 3.1 | 1.7 | - | Slightly triangular dark reflector, not particularly distinct, with a long, narrow and bright shadow. | |
| 71001 | Seafloor disturbance | 404559 | 5852372 | A2 | 22.0 | 5.0 | 1.1 | - | Elongated seafloor disturbance with irregular shadows or numerous objects with height close together in a line. In the bathymetry data this is visible as a linear alignment of small mounds, slightly more distinct than surrounding seabed features, aligned east to west. | |
| 71002 | Dark reflector | 404548 | 5853642 | A2 | 0.4 | 0.3 | 0.4 | - | Distinct, relatively straight dark reflector with a broad shadow. | |
| 71003 | Magnetic | 404541 | 5851825 | A2 | - | - | - | 402 | Large dipolar anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71004 | Magnetic | 404512 | 5852601 | A2 | - | - | - | 191 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71005 | Magnetic | 404498 | 5853434 | A2 | - | - | - | 83 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71006 | Magnetic | 404490 | 5853306 | A2 | - | - | - | 28 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71007 | Dark reflector | 404399 | 5851916 | A2 | 18.1 | 1.1 | 0.6 | - | Elongated, relatively straight dark reflector with a slightly irregular jagged shadow. | |
| 71008 | Debris | 404365 | 5852692 | A2 | 5.0 | 2.5 | 1.1 | 77 | Dark reflector with a broad, slightly jagged shadow, distinct feature with a medium magnetic anomaly associated indicating ferrous debris | |
| 71009 | Debris | 404352 | 5852638 | A2 | 7.0 | 5.2 | 3.0 | - | A large dark reflector with a distinct, broad shadow, appears to be broken up or partially buried and looks particularly distinct. Possibly debris. Visible in the bathymetry data as a pointed mound with a circular profile. Close to a debris field 71011 | |
| 71010 | Dark reflector | 404340 | 5852252 | A2 | 2.6 | 0.5 | 0.4 | - | Two dark reflector objects with a broad shadow with other bright reflectors surrounding them | |
| 71011 | Debris field | 404337 | 5852642 | A2 | 23.2 | 5.1 | 1.8 | - | A large patch of dark reflectors with a long, distinct jagged shadow. Possibly debris field, feature looks particularly distinct compared to surrounding sediment. Visible in the bathymetry data as an irregular shaped large oval mound close to another smaller mound, More distinct than surrounding seabed features. Is close to a piece of debris 71009. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71012 | Magnetic | 404310 | 5852174 | A2 | - | - | - | 24 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71013 | Magnetic | 404296 | 5854168 | A2 | - | - | - | 38 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71014 | Magnetic | 404232 | 5851985 | A2 | - | - | - | 136 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71015 | Dark reflector | 404182 | 5853087 | A2 | 10.6 | 0.5 | 0.3 | - | Elongated, slightly curved dark reflector with a distinct shadow. | |
| 71016 | Dark reflector | 404136 | 5852961 | A2 | 8.0 | 0.3 | 0.3 | - | Straight, slight, dark reflector with a distinct shadow. | |
| 71017 | Debris | 404133 | 5852674 | A2 | 3.5 | 1.7 | 1.1 | 55 | Dark reflector with a distinct, slightly irregular shadow. Shadow appears to extend beyond the limits of dark reflector, has a medium magnetic anomaly associated indicating ferrous debris | |
| 71018 | Magnetic | 404133 | 5853090 | A2 | - | - | - | 130 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71019 | Rope/chain | 404118 | 5853471 | A2 | 20.9 | 0.3 | 0.3 | - | Slight linear item, not particularly distinct, with a faint shadow. Very long and thin possible rope or chain feature. | |
| 71020 | Magnetic | 404088 | 5855253 | A2 | - | - | - | 72 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71021 | Debris | 404054 | 5852315 | A2 | 5.6 | 1.9 | 0.7 | - | Elongated, irregularly shaped dark reflector with a distinct shadow with some slight scour, possibly debris | |
| 71022 | Dark reflector | 404029 | 5853119 | A2 | 9.0 | 0.3 | 0.3 | - | Long, thin and straight dark reflector with a distinct shadow. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71023 | Mound | 404025 | 5854891 | A2 | 36.7 | 22.0 | 3.0 | - | Mound with a distinct, broad shadow, comprised of small, dark reflectors with height. Visible in the bathymetry as a distinct and large circular mound. | |
| 71024 | Rope/chain | 404024 | 5854631 | A2 | 22.6 | 0.1 | 0.1 | - | Faint, curvilinear dark reflector identified with slight shadow, possible length of rope or chain. | |
| 71025 | Magnetic | 404022 | 5854153 | A2 | - | - | - | 56 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71026 | Mound | 404016 | 5855180 | A2 | 21.0 | 20.0 | 1.3 | - | Small mound with a distinct, irregular shadow, possibly comprising small objects with height. In the bathymetry data this is visible as an irregular mound near the southern end of a natural depression. | |
| 71027 | Debris field | 404000 | 5852417 | A2 | 54.0 | 16.0 | 0.8 | - | Possible debris field comprising over ten dark and bright reflectors, some long thin and distinct linear dark reflectors with shadows visible (8.2m x 0.8m x 0.7m maximum). | |
| 71028 | Magnetic | 403995 | 5851922 | A2 | - | - | - | 120 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71029 | Debris | 403994 | 5854060 | A2 | 1.9 | 0.2 | 1.6 | 32 | Dark reflector with a long, narrow shadow. Has a small magnetic anomaly associated indicating ferrous debris | |
| 71030 | Dark reflector | 403954 | 5852726 | A2 | 4.4 | 1.0 | 0.4 | - | Straight dark reflector with a broad shadow. Feature looks fairly straight however may just be distorted by movement of sonar fish. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71031 | Debris | 403929 | 5853910 | A2 | 2.1 | 0.5 | 0.9 | 226 | Indistinct slightly irregular dark reflector with a long shadow. Full extent is possibly covered by sandy sediments. Has a large magnetic anomaly associated indicating ferrous debris. | |
| 71032 | Magnetic | 403915 | 5854331 | A2 | - | - | - | 73 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71033 | Magnetic | 403858 | 5851976 | A2 | - | - | - | 108 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71034 | Rope/chain | 403849 | 5854418 | A2 | 13.6 | 0.3 | 0.1 | - | Faint, slightly curved linear dark reflector with a slight shadow, possibly rope or chain. | |
| 71035 | Magnetic | 403849 | 5853353 | A2 | - | - | - | 31 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71036 | Rope/chain | 403842 | 5854306 | A2 | 24.8 | 0.2 | 0.4 | 37 | Distinct, relatively straight linear dark reflector with height. Feature bends round at an angle at one end. Possible rope or chain on an otherwise featureless area of the seabed. Has a small negative monopole associated indicating some ferrous content. | |
| 71037 | Rope/chain | 403840 | 5853945 | A2 | 25.5 | 0.8 | 0.3 | - | Long and thin linear item of debris with a slight shadow. Identified in a relatively featureless area of seafloor, possible rope or chain feature. | |
| 71038 | Dark reflector | 403837 | 5853230 | A2 | 8.8 | 0.2 | 0.3 | - | A long and straight, slight, dark reflector with a distinct shadow. Identified in an area of megaripples however appears to be perpendicular to the orientation of the natural features. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71039 | Magnetic | 403835 | 5852029 | A2 | - | - | - | 199 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71040 | Magnetic | 403822 | 5852844 | A2 | - | - | - | 54 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71041 | Debris | 403761 | 5854672 | A2 | 1.0 | 0.9 | 0.5 | 103 | Dark reflector with broad slightly irregular shadow. Possibly related to a linear dark reflector 4 m away (71042). Identified in a relatively featureless area of seabed. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71042 | Dark reflector | 403758 | 5854662 | A2 | 19.2 | 0.3 | 0.3 | - | Long, thin and slightly curvilinear dark reflector with height. Possibly associated with ferrous debris object (71041) | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71043 | Wreck | 403723 | 5852349 | A1 | 60.0 | 56.0 | 1.9 | 322 | <p>A large wreck broken into two sections, that appear to be in a poorly preserved condition lying at right angles one another. The larger section is to the north and orientated east to west with dimensions of 52m x 17m x 0.5m. The wreck has straight edges along its length and the deck appears to be intact showing some superstructure. The boundaries of the wreck are not always discernible in the data. There is slight scouring orientated north-west to south-east. The second section of the wreck has dimensions of 37m x 14m x 1.9m and is orientated north-east to south-west. This section of the wreck appears more degraded in the sidescan sonar data with little detail other than the hull edge discernible. The complete dimensions of the wreck site are 60m x 56m x 1.9m. This wreck has a large magnetic anomaly measuring 322 nT associated, indicating a ferrous construction or cargo. In the bathymetry data this is visible as a large wreck split in two parts that appears to be very degraded and poorly preserved with little height off the seabed. Overall the wreck appears to be poorly preserved and as it is located within large sandwaves, there is potential for associated debris to be buried in the vicinity. UKHO record 86378 is associated with this wreck. It is unknown and described as being split into two pieces, one measuring 50m and the other 35m long.</p> | 86378 (UKHO) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71044 | Magnetic | 403709 | 5853753 | A2 | - | - | - | 253 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71045 | Dark reflector | 403707 | 5853319 | A2 | 6.6 | 0.6 | 0.2 | - | Straight, slight, dark reflector with a distinct shadow in an area of relatively featureless seabed. | |
| 71046 | Debris | 403698 | 5852274 | A2 | 2.5 | 0.3 | 0.5 | 109 | Small straight object within a depression and some irregular bright shadow. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71047 | Dark reflector | 403652 | 5852168 | A2 | 5.1 | 2.7 | 0.6 | - | Rounded object with possible irregular object or sediment build up adjacent | |
| 71048 | Magnetic | 403647 | 5853542 | A2 | - | - | - | 362 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71049 | Magnetic | 403611 | 5852965 | A2 | - | - | - | 79 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71050 | Magnetic | 403595 | 5855307 | A2 | - | - | - | 40 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71051 | Debris | 403587 | 5855192 | A2 | 3.2 | 0.4 | 0.2 | 27 | Short and straight dark reflector with a distinct, slightly broad shadow. Has a small magnetic anomaly associated indicating ferrous debris | |
| 71052 | Rope/chain | 403563 | 5854315 | A2 | 92.5 | 0.3 | 0.1 | - | A long and thin linear dark reflector in a broad 'v' shape with a slight shadow, or a linear split in two/partially buried in its centre . Very long and distinct possible rope or chain, appears to be covered by sediment in parts. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71053 | Magnetic | 403518 | 5852408 | A2 | - | - | - | 148 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71055 | Magnetic | 403491 | 5854782 | A2 | - | - | - | 68 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71056 | Magnetic | 403486 | 5852275 | A2 | - | - | - | 71 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71057 | Magnetic | 403467 | 5853573 | A2 | - | - | - | 54 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71058 | Dark reflector | 403457 | 5852745 | A2 | 3.7 | 1.7 | 1.5 | - | Irregular series of dark reflectors, possibly with a faint, long, narrow shadow. Possibly natural however looks a little anomalous to surroundings. | |
| 71059 | Dark reflector | 403457 | 5853696 | A2 | 2.1 | 0.6 | 0.7 | - | Short, straight dark reflector with a relatively broad shadow. | |
| 71060 | Debris | 403450 | 5852335 | A2 | 1.6 | 0.7 | 0.4 | 175 | Small straight object with angular bright shadow, has a medium dipole associated indicating ferrous debris | |
| 71061 | Magnetic | 403426 | 5852756 | A2 | - | - | - | 41 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71062 | Magnetic | 403409 | 5854938 | A2 | - | - | - | 153 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71063 | Magnetic | 403407 | 5852958 | A2 | - | - | - | 539 | Large asymmetric dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71064 | Debris | 403387 | 5852775 | A2 | 35.2 | 4.0 | 0.4 | 70 | Elongated, large dark reflector with an irregular shadow. In the bathymetry data this is visible as a long and thick linear item of debris orientated north-west to south-east and possibly broken up or partially buried in parts. Has a medium dipole associated indicating ferrous debris | |
| 71065 | Dark reflector | 403386 | 5855256 | A2 | 10.5 | 8.0 | 0.9 | - | Two elongated, slightly rectangular dark reflectors with a broad, slightly irregular shadow situated parallel to one another. The smaller object measures 3.8 m x 2.8 m x 0.9 m and the larger object 4 m x 3.6 m x 0.8 m. In the multibeam data this is visible as two mounds situated within a depression | |
| 71066 | Magnetic | 403377 | 5854967 | A2 | - | - | - | 133 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71067 | Debris | 403366 | 5852457 | A2 | 6.3 | 1.8 | 0.4 | 92 | Irregular and possibly segmented dark reflector with slightly curved bright shadow. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71068 | Magnetic | 403343 | 5855465 | A2 | - | - | - | 21 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71069 | Magnetic | 403311 | 5852521 | A2 | - | - | - | 645 | Large dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71070 | Dark reflector | 403224 | 5853126 | A2 | 5.4 | 1.2 | 0.3 | - | Straight dark reflector, possibly with a taller section at one end, and a distinct shadow. | |
| 71071 | Magnetic | 403222 | 5852538 | A2 | - | - | - | 352 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71072 | Magnetic | 403217 | 5852685 | A2 | - | - | - | 17 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71073 | Magnetic | 403179 | 5854938 | A1 | - | - | - | 949 | Very large dipole identified on more than one survey line. Indicative of possible substantial buried ferrous debris. | |
| 71074 | Magnetic | 403177 | 5852564 | A2 | - | - | - | 226 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71075 | Magnetic | 403157 | 5852804 | A2 | - | - | - | 66 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71076 | Dark reflector | 403156 | 5853066 | A2 | 7.9 | 0.2 | 0.3 | - | Distinct, narrow elongated dark reflector with a broad shadow. | |
| 71077 | Bright reflector | 403155 | 5853210 | A2 | 6.2 | 1.0 | 0 | - | Short, narrow, rectangular bright reflector. Possibly a shadow but with no discernible contact. | |
| 71078 | Magnetic | 403087 | 5852984 | A2 | - | - | - | 179 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71079 | Magnetic | 403051 | 5853039 | A2 | - | - | - | 121 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71080 | Debris | 403019 | 5853862 | A2 | 4.9 | 3.5 | 1.7 | 141 | Slightly triangular dark reflector with a stronger response at the front of the feature, with a long, narrow shadow. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71081 | Magnetic | 402897 | 5853157 | A2 | - | - | - | 74 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71082 | Debris field | 402897 | 5855122 | A2 | 42.0 | 12.0 | 2.7 | - | Large area of possible partially buried debris field, tens of small exposed dark reflectors with shadows, which appears to be on a raised area of the seabed as there is a very large and bright shadow displaying substantial height visible, the sss dimensions are larger (55.5m x 28.1m) but in the bathymetry data this feature is more defined and visible as a large elongated mound with a steep south side and the northern side displaying no clearly defined edge, the feature is orientated north-west to south-east. | |
| 71083 | Rope/chain | 402876 | 5854834 | A2 | 59.2 | 0.8 | 1.3 | - | Long and thin slightly curvilinear dark reflector with a slight shadow. Possible rope or chain. Also has a small object at one end measuring 0.8m x 0.8m x 1.3m. | |
| 71084 | Dark reflector | 402874 | 5852852 | A2 | 3.3 | 2.6 | 0.2 | - | A small angular object with some scour and corresponding shadow | |
| 71085 | Magnetic | 402868 | 5856051 | A2 | - | - | - | 46 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71086 | Magnetic | 402827 | 5854036 | A2 | - | - | - | 132 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71087 | Magnetic | 402782 | 5852993 | A2 | - | - | - | 12 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71088 | Debris | 402774 | 5853831 | A2 | 6.7 | 0.3 | 0.5 | - | Straight, distinct dark reflector with a broad shadow. Possibly two linear contacts close together with a third in its shadow. | |
| 71089 | Magnetic | 402761 | 5853242 | A2 | - | - | - | 25 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71090 | Dark reflector | 402750 | 5854987 | A2 | 5.3 | 3.2 | 0.3 | - | Two long and thin dark reflectors in a 'v' shape with a slight shadow. Smaller linear measures 3.7 m x 0.3 m x 0.2 m and larger linear 5.3 m x 0.4 m x 0.2 m | |
| 71091 | Dark reflector | 402636 | 5853108 | A2 | 2.0 | 1.1 | 0.4 | - | Angular object with angular scour and angular bright shadow, located in sandwaves | |
| 71092 | Magnetic | 402568 | 5853189 | A2 | - | - | - | 61 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71093 | Magnetic | 402567 | 5853091 | A2 | - | - | - | 16 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71094 | Magnetic | 402562 | 5853209 | A2 | - | - | - | 53 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71095 | Dark reflector | 402526 | 5853432 | A2 | 6.7 | 0.2 | 0.2 | - | Straight dark reflector with a slightly rounded shadow | |
| 71096 | Magnetic | 402492 | 5855653 | A2 | - | - | - | 515 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71097 | Debris field | 402489 | 5856330 | A2 | 21.1 | 0.6 | 0.2 | 137 | A large spread of debris consisting of a curvilinear, thin dark reflector that is in a slight 'v' shape, a possible rope or chain possibly partially buried by fine sediments. Two objects, a relatively poorly defined dark reflector with an irregular shadow measuring 1.6 m x 0.5 m x 0.5 m and a relatively straight dark reflector with a slight shadow measuring 2.9 m x 0.5 m x 0.1 m. Has a medium magnetic anomaly associated indicating ferrous debris | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71098 | Magnetic | 402467 | 5855677 | A2 | - | - | - | 92 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71099 | Magnetic | 402443 | 5853664 | A2 | - | - | - | 49 | Small distinct negative monopole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71100 | Magnetic | 402425 | 5853407 | A2 | - | - | - | 19 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71101 | Magnetic | 402414 | 5853236 | A2 | - | - | - | 162 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71102 | Seafloor disturbance | 402391 | 5853488 | A2 | 10.2 | 5.2 | 0.7 | - | Large irregular area of dark reflector objects with some angular bright shadows. | |
| 71103 | Magnetic | 402386 | 5853657 | A2 | - | - | - | 204 | Large distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71104 | Debris | 402380 | 5855778 | A2 | 40.2 | 0.3 | 0.1 | 368 | Long, faint linear dark reflector with a very slight shadow, not particularly distinct. Has a dark reflector with a narrow shadow at one end measuring 2.2 m x 0.5 m x 0.8 m. Possibly a length of rope/chain with an object such as an anchor at one end. Has a large magnetic anomaly associated indicating ferrous debris | |
| 71105 | Magnetic | 402357 | 5853620 | A2 | - | - | - | 100 | Medium irregular dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71106 | Dark reflector | 402355 | 5853542 | A2 | 8.3 | 1.4 | 0.6 | - | Irregular object, possibly several adjacent objects, with irregular bright shadow | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71107 | Magnetic | 402341 | 5853745 | A2 | - | - | - | 35 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71108 | Magnetic | 402332 | 5853707 | A2 | - | - | - | 40 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71109 | Debris field | 402331 | 5854753 | A2 | 22.4 | 17.5 | 0.4 | 126 | An area of several, faint objects with relatively broad shadows, possible large area of seafloor disturbance. Has a medium magnetic anomaly associated indicating ferrous material is present. | |
| 71110 | Dark reflector | 402282 | 5854774 | A2 | 4.7 | 0.2 | 0.5 | - | Slightly 's' shaped narrow dark reflector with a relatively broad shadow. | |
| 71111 | Dark reflector | 402228 | 5853594 | A2 | 4.1 | 0.2 | 0.2 | - | Straight, narrow dark reflector with a broad shadow | |
| 71112 | Dark reflector | 402181 | 5855359 | A2 | 8.1 | 0.3 | 0.3 | - | Slightly curved elongated, narrow dark reflector with a slight shadow. Identified in a relatively featureless area of seabed, indistinct anomaly. | |
| 71113 | Magnetic | 402137 | 5853592 | A2 | - | - | - | 91 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71114 | Magnetic | 402095 | 5856299 | A2 | - | - | - | 54 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71115 | Rope/chain | 402089 | 5854097 | A2 | 53.3 | 0.4 | 0.1 | 101 | Linear item of debris identified towards the edge of the data therefore measurements should be considered a minimum. Has a medium magnetic anomaly associated indicating ferrous debris, possibly chain. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 71116 | Magnetic | 402081 | 5853919 | A2 | - | - | - | 187 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71117 | Wreck | 402077 | 5855893 | A1 | 50.2 | 26.4 | 1.7 | 13265 | A large area of dispersed wreck remains. The wreck appears broken up with tens of individual linear dark reflectors with shadows visible. The wreck is orientated north-west to south-east. In the bathymetry data the wreck is visible as an oval shaped uneven mound and appears very degraded with little height standing on a featureless area of the seabed. There is a very large magnetic anomaly associated indicating a ferrous construction. UKHO 10568 records this as the HMS <i>Francolin</i> , a trawler bombed and sunk by a German aircraft in 1941. Last observed in 2015 as 40m x 16m x 1.6m. | 10568 (UKHO); 907473 (NRHE) |
| 71118 | Magnetic | 402075 | 5855279 | A2 | - | - | - | 25 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71119 | Debris | 402073 | 5854603 | A2 | 4.7 | 3.7 | 0.8 | 54 | Faint, broad dark reflector with an irregular jagged shadow. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71120 | Magnetic | 402048 | 5855989 | A2 | - | - | - | 321 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71121 | Dark reflector | 402039 | 5853872 | A2 | 16.0 | 3.0 | 0.3 | - | Irregular object with irregular bright shadow. In the bathymetry data this is visible as a long and thin linear mound, possibly outcropping geology | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71122 | Debris field | 402025 | 5854516 | A2 | 83.4 | 19.1 | 0.3 | 362 | Large area of several dispersed linear items of debris with height. Has a large magnetic anomaly associated indicating ferrous debris | |
| 71123 | Dark reflector | 402018 | 5853565 | A2 | 1.3 | 0.7 | 0.4 | - | Irregular object with an angular bright shadow | |
| 71124 | Magnetic | 402015 | 5856509 | A2 | - | - | - | 50 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71125 | Magnetic | 402011 | 5856297 | A2 | - | - | - | 61 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71126 | Magnetic | 402000 | 5856033 | A2 | - | - | - | 396 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71127 | Magnetic | 401961 | 5853630 | A2 | - | - | - | 64 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71128 | Wreck | 401921 | 5856180 | A1 | 16.3 | 8.0 | 0.9 | 954 | A large spread of several dark reflectors, some of which appear to be relatively straight, with height. Visible in the bathymetry data as an elongated long mound orientated north to south on a relatively flat and even area of the seabed. The vessel has a large magnetic anomaly associated indicating ferrous content. Has a UKHO record (82483) associated which states unknown wreck last observed in 2015 with dimensions of 15m x 6m x 1m. | 82483 (UKHO) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|-------------------------------|
| 71129 | Wreck | 401875 | 5853654 | A1 | 30.0 | 16.0 | 2.6 | 555 | A medium sized wreck, sections of the hull outline of the vessel are discernible in the sidescan sonar data with some internal structure visible within this. The vessel comprises indistinct dark and bright reflectors, some linear and some irregular anomalies across its extent. There are numerous slatted dark reflectors with shadows and associated debris scattered across the seafloor around the wreck. In the bathymetry data the wreck goes beyond the data extent and so sidescan co-ordinates have been used. A large mound is partially visible within the bathymetry data, though there is little detail or structure discernible. Has a large dipole associated indicating a ferrous construction. Associated with the UKHO record 10560 for wreck of <i>HMS Dungeness</i> although this record has a position 50m from the observed wreck. | 10560 (UKHO); MNF38252 (NHER) |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71130 | Debris | 401822 | 5856630 | A2 | 5.0 | 4.6 | 1.7 | 70 | Large dark reflector with associated scour and a long, distinct but tapered shadow. Object is sat within a rounded patch of bright reflector interpreted to be a depression. In the bathymetry data this is visible as a distinct rounded mound in the centre of a slight depression or scour (21 m x 15 m x -1 m). Has a medium sized magnetic anomaly associated indicating ferrous debris. Has a UKHO record associated (82482) for an obstruction which was last observed in 2015 with dimensions of 3.5 m x 3.5 m x 1.6 m | 82482 (UKHO) |
| 71131 | Wreck | 401775 | 5856176 | A1 | 13.0 | 7.0 | 3.0 | 368 | A recorded wreck visible as a seafloor disturbance comprised of several dark reflectors with a distinct, broad shadow. The feature has a large height measurement and appears to be partially buried by sediments. No discernible wreck features are visible which suggests this is very degraded. The wreck is visible in the bathymetry data as a distinct oval shaped mound orientated north-west to south-east in a featureless area of the seabed. The wreck has a large magnetic anomaly associated indicating ferrous material. UKHO 82484 records this as an unknown wreck, last identified in 2015 with dimensions of 9m x 4.5m x 2.3m and orientated 130 ° on the seabed. | 82484 (UKHO) |
| 71132 | Magnetic | 401769 | 5856248 | A2 | - | - | - | 29 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71133 | Debris | 401768 | 5854018 | A2 | 4.0 | 0.5 | 0.3 | 475 | Angular and poorly defined object with a relatively broad shadow and some scour, has a large magnetic anomaly associated indicating ferrous debris | |
| 71134 | Magnetic | 401739 | 5853966 | A2 | - | - | - | 42 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71135 | Magnetic | 401734 | 5854916 | A2 | - | - | - | 79 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71136 | Magnetic | 401727 | 5853854 | A2 | - | - | - | 28 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71137 | Magnetic | 401723 | 5856646 | A2 | - | - | - | 32 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71138 | Magnetic | 401718 | 5855476 | A2 | - | - | - | 25 | Small and distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71139 | Bright reflector | 401713 | 5854300 | A2 | 8.9 | 2.7 | 0.3 | - | A long, straight and distinct bright reflector. Possibly a shadow however with no discernible contact. | |
| 71140 | Magnetic | 401675 | 5855045 | A2 | - | - | - | 61 | Medium distinct dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71141 | Dark reflector | 401666 | 5854116 | A2 | 5.6 | 0.7 | 0.4 | - | Curvilinear dark reflector with a relatively broad shadow. Identified in an area of megaripples lying perpendicular to orientation of ripples. | |
| 71142 | Dark reflector | 401659 | 5854223 | A2 | 3.0 | 0.2 | 0.1 | - | Small straight object with small tapered shadows at each end. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71143 | Dark reflector | 401656 | 5854587 | A2 | 7.2 | 4.4 | 0 | - | Two similar looking, slightly elongated, straight dark reflectors with a relatively irregular shadow. Situated next to one another on a flat and even area of the seabed, smaller anomaly measures 6.7 m x 0.7 m and larger feature measures 7.2 m x 1.4 m | |
| 71144 | Dark reflector | 401621 | 5855053 | A2 | 2.3 | 0.7 | 0.5 | - | Short, relatively straight dark reflector with a broad, distinct shadow. | |
| 71145 | Bright reflector | 401605 | 5854301 | A2 | 3.1 | 1.9 | 0 | - | Circular bright reflector with an irregularly shaped dark reflector in its centre. | |
| 71146 | Bright reflector | 401555 | 5854388 | A2 | 3.7 | 0.4 | 0 | - | Straight, narrow bright reflector, looks quite distinct. Possibly a shadow, but no discernible dark reflector at front. | |
| 71147 | Magnetic | 401553 | 5856720 | A2 | - | - | - | 53 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71148 | Magnetic | 401534 | 5855240 | A2 | - | - | - | 248 | Large asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71149 | Magnetic | 401529 | 5856199 | A2 | - | - | - | 12 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71150 | Bright reflector | 401504 | 5854334 | A2 | 2.8 | 0.4 | 0 | - | Small straight object with no obvious reflector. | |
| 71151 | Dark reflector | 401502 | 5854303 | A2 | 2.6 | 0.7 | 0.5 | - | Slightly curved object with an irregularly shaped bright shadow | |
| 71152 | Magnetic | 401474 | 5856193 | A2 | - | - | - | 90 | Medium asymmetric dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71153 | Dark reflector | 401467 | 5854106 | A2 | 3.3 | 0.5 | 0.3 | - | Straight edge of an object that seems to be within a depression and some slanted bright shadow | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71154 | Bright reflector | 401467 | 5855878 | A2 | 9.6 | 1.0 | 0 | - | Straight, narrow bright reflector. Possibly a shadow but with no discernible contact. | |
| 71155 | Magnetic | 401465 | 5854269 | A2 | - | - | - | 181 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71156 | Bright reflector | 401440 | 5854631 | A2 | 1.7 | 1.1 | 0 | - | Circular, bright reflector with a dark reflector in its centre. | |
| 71157 | Magnetic | 401429 | 5856233 | A2 | - | - | - | 81 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71158 | Debris | 401428 | 5854135 | A2 | 1.5 | 0.5 | 0.2 | 146 | Small object within a depression and some angular shadow, located close to wreck and may be associated debris. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71159 | Bright reflector | 401423 | 5854576 | A2 | 2.2 | 1.2 | 0 | - | Small, circular bright reflector with a hole at the centre, very distinct object on a sandy and even area of the seabed. | |
| 71160 | Dark reflector | 401421 | 5854773 | A2 | 5.8 | 0.5 | 0.2 | - | Short, straight dark reflector, slightly rectangular with a distinct shadow. | |
| 71161 | Magnetic | 401385 | 5854637 | A2 | - | - | - | 40 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71162 | Wreck | 401376 | 5854164 | A1 | 54.5 | 18.2 | 2.6 | 370 | Large area of indistinct wreck remains consisting of an elliptical area of dark and bright reflectors with some bright shadows. A large area of seabed is disturbed around the wreck suggesting that there may be further buried debris under sediments. It is also difficult to distinguish the full extends in the sidescan data. In the bathymetry data this is visible as a broken up and poorly preserved wreck, the southern section of the wreck is larger and more defined. The northern section of wreck is visible whilst the centre is broken up and appears to be partially buried. Has a large dipole identified on more than one survey line associated indicating a ferrous composition. Associated UKHO record 86203 is of an unknown wreck - the wreck was last observed in 2016 and measured with a length of 30m. | 86203 (UKHO) |
| 71163 | Debris | 401329 | 5855793 | A2 | 49.7 | 6.0 | 0.3 | - | Linear item of debris with height, folded round in a 'V' shape. 70 m from wreck (71172) and may be associated debris | |
| 71164 | Magnetic | 401322 | 5854326 | A2 | - | - | - | 49 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71165 | Magnetic | 401321 | 5855374 | A2 | - | - | - | 89 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71166 | Magnetic | 401309 | 5854776 | A2 | - | - | - | 72 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71167 | Debris | 401306 | 5855773 | A2 | 21.0 | 0.3 | 0.3 | - | Very slight, linear item of debris located 35 m from wreck 71172 | |
| 71168 | Dark reflector | 401292 | 5854578 | A2 | 8.8 | 1.3 | 0.1 | - | A long, thick and straight object with possible shadow and secondary dark reflector. | |
| 71169 | Magnetic | 401274 | 5854309 | A2 | - | - | - | 45 | Symmetric small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71170 | Debris | 401270 | 5854436 | A2 | 8.2 | 6.1 | 0.3 | 119 | A large piece of debris comprising some linear dark reflectors with shadows likely covered by fine sediment. Has a medium dipole associated indicating ferrous debris | |
| 71171 | Mound | 401261 | 5856319 | A2 | 3.2 | 3.0 | 1.3 | - | Distinct, slightly square dark reflector with a clearly defined, tapered shadow. Visible in the bathymetry data as a small mound in the centre of a small depression of scour measuring 12 m x 12 m x 0.2 m | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|--------------------------------|
| 71172 | Wreck | 401255 | 5855809 | A1 | 93.5 | 29.0 | 5.5 | 4056 | Large area of dispersed wreck, visible in the sidescan data as numerous objects with height, some of which appear to be quite straight and possibly structural. One contact has a long, slightly tapered shadow. The wreck is visible in the bathymetry data as upright and intact, orientated north-west to south-east. Two distinct possible structural elements can be seen in the centre of the wreck, possibly boilers, which are the highest point of the wreckage. The northern end of the vessel appears to be mostly buried or broken up. There is a very large magnetic anomaly associated with this wreck indicating a ferrous construction. UKHO 10571 records this as a dispersed unknown wreck fouled by boat sweep. | 10571 (UKHO); 907472 (NRHE) |
| 71173 | Dark reflector | 401249 | 5854602 | A2 | 3.9 | 0.5 | 0.5 | - | Relatively straight, narrow dark reflector with a broad, rounded shadow. | |
| 71174 | Debris | 401248 | 5854713 | A2 | 5.7 | 0.2 | 0.0 | - | Straight, linear dark reflector with no discernible height. Located 91 m north-east from wreck 71181 and may be associated debris | |
| 71175 | Debris | 401240 | 5854713 | A2 | 6.3 | 0.6 | 0.0 | - | A long, thin and straight dark reflector with no discernible height. Located 83 m north-east from wreck 71181 and may be associated debris | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71176 | Wreck | 401228 | 5854614 | A1 | 19.8 | 8.0 | 1.0 | - | Possible wreck with no UKHO record. A discrete but irregular outline of parallel dark reflectors with some irregular bright shadow, likely to be structural possible deck remains. Looks to be intact with a slatted texture and orientated north-east to south-west on a rocky area of the seabed. As there is no magnetic anomaly this is likely to be a non-ferrous wreck. In the bathymetry data this wreck is visible as a linear mound orientated north-east to south-west on a rough and uneven area of the seabed. | |
| 71177 | Magnetic | 401204 | 5854502 | A2 | - | - | - | 22 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71178 | Magnetic | 401202 | 5854377 | A2 | - | - | - | 69 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71180 | Magnetic | 401175 | 5854574 | A2 | - | - | - | 62 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71181 | Wreck | 401163 | 5854662 | A1 | 73.0 | 48.7 | 3.1 | 25165 | A large area of dispersed wreckage. A large amount of structural debris is visible as linear dark and bright reflectors, as well as a possible slatted deck area. The wreck appears to be orientated north-east to south-west lying within sandwaves and more debris may be buried by sediment. In the bathymetry data this appears as a partially buried wreck, which looks to be broken up, with scour on the west side measuring approximately 60m. A UKHO record (58447) for an unknown wreck is in the vicinity of the wreck with dimensions of 30m x 8m x 3m. Observed in 2015 with dimensions 77m x 16m x 2.5m. | 58447 (UKHO) |
| 71183 | Debris | 401157 | 5854730 | A2 | 2.8 | 0.4 | 0.2 | - | Two short, straight parallel dark reflectors with a broad, slightly irregular shadow. Possibly debris associated with wreck (71181) 20 m to the south | |
| 71184 | Debris field | 401155 | 5854537 | A2 | 10.5 | 4.5 | 0.5 | - | Possible debris field. An irregular area of objects with angular bright shadows located on a rough and uneven area of the seabed, possibly partially buried by sediments. Approximately five features. | |
| 71185 | Dark reflector | 401131 | 5857129 | A2 | 0.7 | 0.3 | 0.5 | - | Dark reflector, slightly straight, with a distinct shadow and some possible associated scour. | |
| 71186 | Debris field | 401050 | 5854541 | A2 | 21.4 | 12.2 | 0.8 | 213 | Group of variously shaped objects with slight shadows. Possible large area of disturbed seabed. Has a large magnetic anomaly to the north-east associated indicating ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|--------------------------------|
| 71187 | Dark reflector | 401038 | 5854543 | A2 | 6.3 | 0.2 | 0.1 | - | Long and straight dark reflector with possible slight shadow | |
| 71188 | Wreck | 400957 | 5857290 | A1 | 26.0 | 8.0 | 4.1 | 1479 | A wreck in poor quality data and possibly buried by sediments concealing its full extents. There is one particularly large object with height which may be one edge of the hull structure, with several possible other objects with height surrounding this. Largest measurements from the sidescan data are 48m x 19.5m but the extents are unclear and partially buried so bathymetry dimensions have been used. Has a very large magnetic anomaly associated indicating a ferrous construction. The UKHO records this wreck as the <i>Ole Bull</i> built in 1901 and was sunk when it struck a mine in 1917. Last recorded in 2015 with dimensions of 22m x 4m x 4.5m. | 10574 (UKHO); 907476 (NRHE) |
| 71189 | Magnetic | 400937 | 5855391 | A2 | - | - | - | 20 | Small negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71190 | Magnetic | 400925 | 5856157 | A2 | - | - | - | 262 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71191 | Magnetic | 400886 | 5855920 | A2 | - | - | - | 63 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71192 | Dark reflector | 400864 | 5854943 | A2 | 3.7 | 0.1 | 0.3 | - | Straight object with bright shadow | |
| 71193 | Dark reflector | 400856 | 5854931 | A2 | 5.3 | 3.4 | 0.3 | - | Irregular slightly right angled object with some bright shadow | |
| 71194 | Dark reflector | 400805 | 5855070 | A2 | 4.7 | 0.4 | 0.4 | - | Long, thin and straight dark reflector with an irregular shadow and three straight bright reflectors at the front. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71195 | Magnetic | 400781 | 5857165 | A2 | - | - | - | 151 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71196 | Dark reflector | 400778 | 5855929 | A2 | 9.1 | 0.2 | 0.2 | - | Very narrow dark reflector, relatively straight with a distinct, but slight, shadow. Identified in a relatively featureless area of seabed. | |
| 71197 | Magnetic | 400772 | 5855161 | A2 | - | - | - | 101 | Medium distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71198 | Mound | 400771 | 5855487 | A2 | 4.6 | 3.7 | 0.7 | - | Dark reflector with a distinct, broad shadow. Identified in the bathymetry data as a small but distinct rounded mound in a depression measuring 13 m x 9 m. | |
| 71199 | Magnetic | 400757 | 5855618 | A2 | - | - | - | 18 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71200 | Magnetic | 400738 | 5855240 | A2 | - | - | - | 127 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71201 | Magnetic | 400650 | 5857288 | A2 | - | - | - | 98 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71202 | Dark reflector | 400611 | 5855654 | A2 | 5.5 | 0.6 | 0.3 | - | Faint dark reflector with a distinct, rectangular shadow. | |
| 71203 | Debris | 400540 | 5855313 | A2 | 2.1 | 0.2 | 0.2 | 128 | Relatively short, straight, dark reflector with a slightly irregular shadow. Has a medium dipole associated indicating ferrous debris | |
| 71204 | Magnetic | 400463 | 5855618 | A2 | - | - | - | 192 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71205 | Magnetic | 400459 | 5855566 | A2 | - | - | - | 31 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71206 | Magnetic | 400437 | 5855779 | A2 | - | - | - | 68 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71207 | Debris | 400434 | 5855240 | A2 | 2.2 | 0.4 | 1.3 | 124 | Cluster of dark reflectors with a tall bright shadow. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71208 | Debris field | 400412 | 5855310 | A2 | 14.3 | 10.7 | 0.2 | 52 | Small patch with several small objects with height. Objects appear to be relatively straight with broad shadows. Has a medium magnetic anomaly associated indicating ferrous debris | |
| 71209 | Debris | 400280 | 5855520 | A2 | 2.5 | 0.7 | 0.3 | 19 | Small, narrow, curvilinear item of debris with height, has a small negative monopole associated indicating ferrous debris. | |
| 71210 | Magnetic | 400235 | 5855597 | A2 | - | - | - | 29 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71211 | Magnetic | 400221 | 5855465 | A2 | - | - | - | 73 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71212 | Debris | 400199 | 5855502 | A2 | 2.1 | 0.5 | 1.9 | 681 | Small straight object with a long, narrow and bright shadow. Has a large magnetic anomaly associated indicating ferrous debris | |
| 71213 | Debris field | 400199 | 5855579 | A2 | 13.0 | 7.5 | 1.4 | 44 | A group of distinct dark reflectors with bright shadows, mostly linear features that may be broken up or partially buried by sediment. The largest measures 3.3 m x 0.2 m. The feature has a small magnetic anomaly associated indicating some ferrous content | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71214 | Magnetic | 400170 | 5855281 | A2 | - | - | - | 91 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71215 | Magnetic | 400161 | 5855708 | A2 | - | - | - | 50 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71216 | Magnetic | 400141 | 5855493 | A2 | - | - | - | 44 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71217 | Magnetic | 400137 | 5857083 | A2 | - | - | - | 538 | Large dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71218 | Magnetic | 400120 | 5856492 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71219 | Dark reflector | 400063 | 5855701 | A2 | 2.8 | 0.1 | 0.2 | - | Small straight object with some bright shadow | |
| 71220 | Magnetic | 400055 | 5855762 | A2 | - | - | - | 33 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71221 | Dark reflector | 399981 | 5857016 | A2 | 2.1 | 1.4 | 0.7 | - | Faint, slightly triangular dark reflector with a long, very narrow, slight shadow. | |
| 71222 | Magnetic | 399926 | 5855928 | A2 | - | - | - | 32 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71223 | Magnetic | 399913 | 5855781 | A2 | - | - | - | 141 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71224 | Magnetic | 399898 | 5855552 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71225 | Magnetic | 399887 | 5855665 | A2 | - | - | - | 66 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71226 | Magnetic | 399844 | 5856278 | A2 | - | - | - | 78 | Medium distinct dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71227 | Magnetic | 399817 | 5855666 | A2 | - | - | - | 42 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71228 | Magnetic | 399788 | 5856999 | A2 | - | - | - | 157 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71229 | Magnetic | 399776 | 5856812 | A2 | - | - | - | 49 | Small irregular anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71230 | Magnetic | 399767 | 5855751 | A2 | - | - | - | 70 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71231 | Dark reflector | 399752 | 5856321 | A2 | 4.5 | 0.7 | 0.8 | - | Faint dark reflector with an angular, slightly irregular shadow. Object appears to have relatively straight elements. | |
| 71232 | Magnetic | 399730 | 5855644 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71233 | Magnetic | 399716 | 5857337 | A2 | - | - | - | 42 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71234 | Magnetic | 399662 | 5857741 | A2 | - | - | - | 46 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71235 | Magnetic | 399659 | 5855691 | A2 | - | - | - | 41 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71236 | Magnetic | 399641 | 5856014 | A2 | - | - | - | 39 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71237 | Magnetic | 399588 | 5856917 | A2 | - | - | - | 196 | Medium positive monopole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71238 | Magnetic | 399528 | 5856109 | A2 | - | - | - | 13 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71239 | Magnetic | 399518 | 5857330 | A2 | - | - | - | 25 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71240 | Magnetic | 399503 | 5856650 | A2 | - | - | - | 34 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71241 | Magnetic | 399486 | 5856268 | A2 | - | - | - | 40 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71242 | Magnetic | 399476 | 5855928 | A2 | - | - | - | 29 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71243 | Debris field | 399461 | 5856564 | A2 | 22.0 | 6.3 | 1.0 | - | Small patch of possible objects, some of which are quite straight, with irregular shadows. Possibly debris field. | |
| 71244 | Magnetic | 399400 | 5855903 | A2 | - | - | - | 16 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71245 | Magnetic | 399373 | 5856846 | A2 | - | - | - | 16 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71246 | Dark reflector | 399341 | 5855971 | A2 | 3.3 | 0.1 | 0 | - | Small linear object with varying bright shadow | |
| 71247 | Magnetic | 399299 | 5855974 | A2 | - | - | - | 30 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|--|---------------------|
| 71248 | Magnetic | 399260 | 5857708 | A2 | - | - | - | 19 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71249 | Magnetic | 399259 | 5856740 | A2 | - | - | - | 227 | Large dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71250 | Magnetic | 399256 | 5856227 | A2 | - | - | - | 60 | Medium negative monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71251 | Magnetic | 399253 | 5857364 | A2 | - | - | - | 26 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71252 | Magnetic | 399180 | 5856952 | A2 | - | - | - | 99 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71253 | Magnetic | 399127 | 5856739 | A2 | - | - | - | 38 | Small distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71254 | Dark reflector | 399079 | 5857144 | A2 | 21.5 | 0.4 | 1.0 | - | A small dark reflector with a broad shadow with a faint linear dark reflector attached, not particularly distinct. | |
| 71255 | Bright reflector | 399078 | 5856593 | A2 | 4.2 | 0.3 | 0 | - | Distinct and thin straight object with no obvious dark reflector. | |
| 71256 | Debris field | 399014 | 5856256 | A2 | 6.7 | 4.7 | 0.1 | 52 | Irregular and discrete area of irregular dark reflectors with some shadow within a large scour. Possible area of disturbed seabed. Identified approximately 17m south-south-west of a magnetic anomaly measuring 52 nT, however difficult to discern which feature, if any, it is associated with. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71257 | Debris field | 399007 | 5856265 | A2 | 14.0 | 9.0 | 1.1 | 52 | An area of disturbed seabed, slightly oval shaped outline with internal linear and curvilinear dark reflectors with shadows. Visible in the MBES data as a distinct, oval shaped low mound. Identified approximately 17m south-west of a magnetic anomaly measuring 52 nT, however difficult to discern which feature, if any, it is associated with. | |
| 71258 | Seafloor disturbance | 398992 | 5856258 | A2 | 14.3 | 3.9 | 0 | - | Irregular area of small straight objects and bright shadow with the largest object measuring 2.3m x 0.2m x 0.2m. | |
| 71259 | Dark reflector | 398973 | 5856292 | A2 | 7.8 | 1.8 | 0.1 | - | Angular area of dark reflector with some scour and some bright shadow | |
| 71260 | Debris | 398962 | 5856255 | A2 | 6.2 | 0.4 | 1.0 | 81 | Sub rounded edge of an object with a bright shadow, has a medium magnetic anomaly associated indicating ferrous debris. | |
| 71261 | Magnetic | 398832 | 5857559 | A2 | - | - | - | 66 | Medium positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71262 | Debris | 398783 | 5857174 | A2 | 2.7 | 0.5 | 1.2 | 23 | Dark reflector with a distinct, angular shadow. Has a small negative monopole associated indicating ferrous debris | |
| 71263 | Bright reflector | 398758 | 5857006 | A2 | 2.8 | 1.5 | 0 | - | Circular bright reflector with darker reflector in centre, identified close to a rope or chain (71264). | |
| 71264 | Rope/chain | 398751 | 5857009 | A2 | 259.0 | 0.8 | 0.4 | 591 | A possible rope or chain feature visible as a long and thin curvilinear dark reflector with slight height. This is orientated north-west to south-east. Has a large dipole associated indicating a ferrous composition. Close to a bright reflector (71263). | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71265 | Magnetic | 398724 | 5856709 | A2 | - | - | - | 15 | Small dipolar anomaly only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71266 | Magnetic | 398723 | 5857115 | A2 | - | - | - | 36 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71267 | Magnetic | 398613 | 5856787 | A2 | - | - | - | 26 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71268 | Dark reflector | 398517 | 5857127 | A2 | 3.3 | 0.5 | 0.2 | - | Small straight object with angular bright shadow | |
| 71269 | Magnetic | 398515 | 5857022 | A2 | - | - | - | 33 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71270 | Dark reflector | 398500 | 5856736 | A2 | 3.9 | 1.9 | 0.4 | - | Irregular object with a rounded bright shadow | |
| 71271 | Debris | 398473 | 5856764 | A2 | 3.2 | 0.6 | 0.1 | 30 | Irregular curvilinear objects with some bright shadow, possibly broken up or partially buried. Has a small distinct dipole associated indicating ferrous debris | |
| 71272 | Debris | 398470 | 5856736 | A2 | 4.9 | 1.9 | 0.3 | 125 | Rounded object within some disturbance, has a medium distinct dipole associated indicating ferrous debris | |
| 71273 | Dark reflector | 398454 | 5856802 | A2 | 2.9 | 0.2 | 0.1 | - | Straight edge of an object with tapered bright shadow | |
| 71274 | Magnetic | 398418 | 5857029 | A2 | - | - | - | 73 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71275 | Dark reflector | 398413 | 5856766 | A2 | 5.9 | 0.2 | 0.2 | - | Two straight edged objects with irregular bright shadows situated next to one another, very similar in size and appearance, individual dimensions are 2.9 m x 0.2 m x 0.2 m and 2 m x 0.2 m x 0.1 m | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71276 | Debris | 398407 | 5857039 | A2 | 4.4 | 2.6 | 0.4 | - | Irregular dark reflector with two straight flared linear objects with some height | |
| 71277 | Magnetic | 398333 | 5857815 | A2 | - | - | - | 82 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71278 | Dark reflector | 398329 | 5856944 | A2 | 2.2 | 0.7 | 0.3 | - | Irregular object with some data missing though assumed darker reflectors and irregular bright shadow | |
| 71279 | Magnetic | 398324 | 5857437 | A2 | - | - | - | 115 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris with no surface expression. | |
| 71280 | Magnetic | 398316 | 5857891 | A2 | - | - | - | 49 | Small asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71281 | Dark reflector | 398245 | 5857040 | A2 | 4.5 | 1.2 | 0.2 | - | Medium sized, curved object with some slight scour and some bright shadow | |
| 71282 | Debris | 398243 | 5857305 | A2 | 8.7 | 4.3 | 0.2 | 13 | An area of linear dark reflectors. A straight edged feature with three perpendicular objects coming off it and some bright shadow, the full extent is possibly covered by sediment. Feature is oriented in a north-east to south-west direction on a rough and uneven area of the seabed. Has a small magnetic anomaly associated indicating some ferrous content | |
| 71283 | Magnetic | 398133 | 5857329 | A2 | - | - | - | 38 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71284 | Magnetic | 398075 | 5857584 | A2 | - | - | - | 104 | Medium distinct dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |



| WA ID | Classification | Easting | Northing | Archaeological Discrimination | Length (m) | Width (m) | Height (m) | Magnetic Amplitude (nT) | Description | External References |
|-------|----------------------|---------|----------|-------------------------------|------------|-----------|------------|-------------------------|---|---------------------|
| 71285 | Dark reflector | 398061 | 5857505 | A2 | 2.0 | 0.5 | 0.8 | - | Small straight object with irregular bright shadow | |
| 71286 | Magnetic | 397977 | 5857280 | A2 | - | - | - | 42 | Small positive monopole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71287 | Magnetic | 397969 | 5857387 | A2 | - | - | - | 133 | Medium dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71288 | Magnetic | 397930 | 5857304 | A2 | - | - | - | 181 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71289 | Magnetic | 397927 | 5857425 | A2 | - | - | - | 37 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71290 | Magnetic | 397923 | 5857657 | A2 | - | - | - | 40 | Small dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71291 | Magnetic | 397882 | 5857699 | A2 | - | - | - | 175 | Medium dipole identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71292 | Seafloor disturbance | 397875 | 5857464 | A2 | 9.1 | 8.1 | 0.3 | - | Irregular area of objects with some irregular bright shadow, possible medium sized area of disturbed seabed. | |
| 71293 | Magnetic | 397824 | 5857480 | A2 | - | - | - | 72 | Medium asymmetric dipole only identified on one survey line. Indicative of possible buried ferrous debris. | |
| 71294 | Magnetic | 397770 | 5857521 | A2 | - | - | - | 88 | Medium irregular anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |
| 71295 | Magnetic | 397733 | 5857497 | A2 | - | - | - | 200 | Medium anomaly identified on more than one survey line. Indicative of possible buried ferrous debris. | |





12.9 Appendix IX: Maritime Archaeological Potential

Introduction

- 12.9.1 Subsequent to the inundation of the Norfolk Vanguard development area by post Devensian rising sea levels due to isostatic rebound, any evidence of human activity can be expected to be of a maritime nature, relating to seafaring and the human exploitation of the sea. As an island, the UK has a long maritime history and, as such, there is potential for the presence of archaeological material spanning from the Mesolithic period to the present day within the study area.
- 12.9.2 The surface of the seabed within the former offshore East Anglian Zone is characterised by a series of sandbanks; elevated, elongated, round or irregular topographic features which are present as layers overlying hard substrata. Sandbanks are not only comprised of finer grained sediments (more suited to the preservation of archaeological material than coarser grained deposits such as gravels), but also often present navigational hazards to vessels passing through the area. In general, therefore, areas in which sandbanks are present have a greater potential for wreck sites to exist. Within the region, these areas of sandbanks have previously been mapped as Areas of Marine Archaeological Potential (AMAP) by the ALSF Navigational Hazards project (Bournemouth University, 2007). The results have noted that the extensive offshore area in the southern extremity of the North Sea, stretching out to the north of Great Yarmouth and to the east of the approaches to the Wash is characterised by a series of shallow long narrow gravely sandbanks running in a northwest to southeast direction across the offshore approached to the coast.
- 12.9.3 This potential for, and the nature of, maritime receptors that may be present within Norfolk Vanguard is discussed below. Alongside other sources, where relevant, the following environmental baseline has been informed by two strategic desk-based assessments undertaken by Wessex Archaeology; the *Early Ships and Boats* project (Wessex Archaeology, 2013c) and the Aggregates Levy Sustainability Fund (ALSF) funded *Assessing Boats and Ships: 1860-1950* (Wessex Archaeology, 2011a-d). The Early Ships and Boats project comprised a strategic desk-based assessment of known and dated vessels from the Prehistoric period up to 1840 within England's wreck resource (including both onshore and English inshore waters up to the 12nm limit) in order to evaluate potential records for selective investigation. *Assessing Boats and Ships: 1860-1950* comprised a national stock-take of wrecks dating between 1860 and 1950, providing supplementary guidance on key themes and interests represented by the known resource with the ultimate aim of enabling better informed decision-making to be undertaken in respect of the wrecks of vessels lost during this period. In each case, the results of these projects enable the special interest of potential wreck sites within the study area to be understood against the existing baseline of currently known and recorded wrecks in England's territorial waters.

Pre- 1580

- 12.9.4 Maritime discoveries of pre-1508 date are very rare. Little is known about Prehistoric maritime activities or types of craft while the data available for the Romano-British and Medieval periods is limited in comparison to subsequent periods. On this basis, all material from this period will be of special interest solely due to the rarity of any discoveries.
- 12.9.5 There are no known or charted wrecks of documented losses from this period within the project area.
- 12.9.6 There is no evidence for Palaeolithic maritime activities in the archaeological record for the UK, although archaeological material from elsewhere suggests that early modern

humans did undertake maritime activities (e.g. Johnstone, 1980; Lourandos, 1997). The resources and skills required to construct simple watercraft, such as hide-covered log or boat rafts, would have been available during this period and it has been postulated that late Upper Palaeolithic communities utilised such craft for coastal journeying and fishing (McGrail, 1987 & 2004). Palaeolithic activity within the study area is signified by the discovery of a number of Palaeolithic flint hand axes and flint implements (**1009** to **1025**), including a set of early hominin footprints (**1017**).

- 12.9.7 During the Mesolithic period that followed, patterns of human settlement associated with inland water ways and coastal environments suggest the likely use of watercraft for fishing and transport although, as for the Palaeolithic, however the lack of available evidence means that the nature of these maritime activities remain unclear. Archaeological discoveries of Mesolithic logboats (e.g. McGrail, 2004: 174) attests to the ability of Mesolithic communities to construct rafts and hide boats. Unfortunately, their light construction makes it less likely that they would survive in the archaeological record.
- 12.9.8 The majority of the proposed project area was probably submerged during the Mesolithic although areas that were coastal or nearshore at this time, particularly those associated with river inlets, are a likely context for the discovery of the remains of early maritime activities and are possible to have existed within the provisional OCC. The extensive deposition of Holocene alluvium associated with the fairly rapid post-Devensian rise in sea level may have concealed any remains of the early prehistoric watercraft.
- 12.9.9 The Early Ships and Boats project (Wessex Archaeology, 2013c) states that within England's wreck resource, just 19 records exist with a date range that falls within the Early Prehistoric Period (Palaeolithic to Mesolithic). These records comprise 18 logboats and one findspot; none have been scientifically dated or identified as surviving in datable archaeological contexts (Wessex Archaeology, 2013c: 33). This highlights the potential importance and historical value of remains of watercraft dating to this period should they be discovered within Norfolk Vanguard.
- 12.9.10 During the Neolithic and early Bronze Age (4,000 to 700 BC) the coastline in the East Coast region would have attained a form similar to that of today whilst the evidence for human activity diversified. This is demonstrated by the movement of goods across the sea with the introduction into the UK of non-native species of livestock and cereals (May 1976) and the discovery of porcellanite stone axes from Ireland, on the UK mainland, and the Western Isles of Scotland (Breen and Forsythe, 2004: 32). The discovery of deep water fish in shell middens at Neolithic sites also demonstrates that marine fishing was being carried out at this time (Ellmers, 1996).
- 12.9.11 As with the Mesolithic, the evidence for Neolithic watercraft is extremely limited in the UK to discoveries of logboats and the precise nature of maritime activities remains unclear. The discovery of a prehistoric logboat has been reported from the River Orwell (Suffolk HER FRT 004) although this date is unproven and it may be of later date. Further logboats of unknown date have also been reported from the River Stour (Suffolk HER - HRK Misc) and on the River Orwell opposite Pond Ouze Point (Suffolk HER - IPS Misc). Activity dating to this period within the provisional OCC is represented by the discovery of a Neolithic polished flint axehead (NRHE 133662).
- 12.9.12 The scale of seafaring activities is considered to have grown through the Bronze Age (2,400 to 700 BC) and Iron Age (700 BC to AD 43) with evidence of significant advances in technology and vessel size. Logboats and hide boats remained in use alongside new vessel types such as the flat-bottomed sewn plank boats suited to a wider variety of uses

in a wider range of environments (McGrail, 2004). These are the earliest known form of plank construction with planks lashed together and made watertight.

- 12.9.13 Some 97 records with a date range that falls within the Late Prehistoric period (Neolithic to Iron Age) were identified as part of the Early Ships and Boats project (Wessex Archaeology, 2013c: 33) within England's wreck resource, comprising two boat burials, three designated wrecks, 84 logboats and eight findspots. Of the 84 logboats, only two were identified as surviving in an archaeological context. This rarity once again highlights the potential importance and historical value of remains of watercraft dating to this period.
- 12.9.14 The potential for the discovery of further examples of early craft within stratified contexts is well demonstrated by the extraordinary discovery of six logboats in a clay-pit at Must Farm near Peterborough in 2011, variously dating between the Middle Bronze Age and the Early Iron Age (Cambridge Archaeological Unit, 2012; English Heritage, 2012: 5). Although discovered onshore, these logboats are testament to the high level of preservation afforded by waterlogged environments and signify the potential for similar finds to exist within comparable environments both offshore and onshore. A few pre-transgression channel features have been observed in NV West, containing Holocene sediments. Such sediments could periodically bury and expose sites such as vessel remains in areas of mobile sediment.
- 12.9.15 A closer unity of people between Britain and the southern North Sea margin was established during the Romano-British period (AD 43 to 410) with an expansion and diversification of trade with the Continent. The later Iron Age saw the emergence of a distinct tradition of Romano-Celtic shipbuilding representing both Roman and northern European methods, capable of regular coastal and oceanic voyages and reflecting substantial, sea-going trade.
- 12.9.16 A significant number of the vessels involved in these movements are likely to have passed through the study area. Trading ports were active on the Suffolk and Norfolk coast and the Roman military establishment made extensive use of the East Anglian coastal waters, transporting goods from garrison to garrison (Rippon, 2008: 86). Caister-on-Sea, for example, provided a clear entry port to the rich farmlands of East Anglia and offered the shortest sea crossing to the mouth of the Rhine.
- 12.9.17 The recorded remains of vessels from this period continue to be rare despite the growth of seafaring activity and the wide range of ocean-going vessels indicated to have been in use in contemporary accounts. The Early Ships and Boats project revealed a total of 34 records within England's wreck resource with a date range that falls within the Roman period, comprising two designated wrecks, 23 logboats, five findspots and four undesignated wrecks (Wessex Archaeology, 2013c: 34). None of the 23 logboats were identified as surviving in an archaeological context.
- 12.9.18 The 'Dark Ages' which succeeded the Roman occupation of Britain saw the migration of Saxon, and later Norse and Danish, settlers into Britain which brought both renewed expansion of trade routes and new shipbuilding customs. A network of Saxon trade and migration routes existed in the southern North Sea, with a number of important ports or landing places along the East Anglian coast. According to the Anglo-Saxon Chronicle, the Saxon leader Cerdic landed at the shore close to Great Yarmouth in AD 495 (Online Medieval and Classical Library) and Dunwich (Dumnoc) is listed as a port in the Anglo-Saxon Chronicle for 636 (Comfort, 1994: 5).
- 12.9.19 There are several archaeological examples of Saxon boats in Suffolk including the lapstrake built boat burials at Ashby Dell (Suffolk HER - HRF 012) and Sutton Hoo (Suffolk

HER - SUT 004, 005, 038). The lap-strake or clinker technique (essentially fastening overlapping planks together to form the hull) was a specifically northern European technique that was best known in the construction of Viking ships of the later 8th and 9th centuries.

- 12.9.20 Viking raids on the eastern British coast began in the 8th century and during the subsequent period of Viking settlement the North Sea continued to act as a communication, trade and migration route to the Scandinavian home countries with England's existing trade routes across the North Sea functioning into the 9th century, although a lower volume of trade passed along them (Friel, 2003: 44). The first evidence of a purpose-built English royal naval force comes from this period at the time of Alfred (King of Wessex 871-99), when a fleet of large, oared ships was built to help fight the invading Danes (English Heritage, 2012: 5). Following the Danish raid in Kent in 885, Alfred's fleet is recorded to have travelled up the River Stour where a battle with the Danes took place (Asser, 1983: 87). Although the Anglo-Saxon fleet emerged as victorious, they were caught unaware when attempting to leave the Stour and were attacked and defeated by a Danish force at the mouth of the river (Huntingdon, 1969: 81).
- 12.9.21 Direct evidence for seafaring activity of this period within East Anglia includes the timbers of a clinker vessel (c. AD 890 to AD 970) at Buss Creek and two oaken rudders (c. AD 850 to AD 950) found offshore close to Southwold in the 1980s (Bacon, 1996: 18-22). The first rudder was trawled up in a fishing net in 1981 while the larger was washed up on the beach at Easton and found by a fisherman after a storm in 1986. To highlight the rarity of vessel remains dating to this period, the Early Ships and Boats project revealed that just 40 records within England's wreck resource have a date range that falls within the post-Roman to Norman Conquest (410 to 1066 AD) period, comprising four boat burials (including the early 7th century Sutton Hoo near Woodbridge, Suffolk), 28 logboats (none of which were identified as surviving in an archaeological context), six findspots and one undesignated wreck (Wessex Archaeology, 2013c: 34).
- 12.9.22 By the time of the Norman Conquest in 1066 many East Anglian ports had developed into busy trading centres, with Norfolk and Suffolk establishing larger fleets than any other region of England at this time (Williams, 1988: 257). This expansion continued throughout the medieval period with the southern North Sea acting as the artery for increasing trade between the UK and Europe.
- 12.9.23 Fishing was also important and during the 13th, 14th and 15th centuries the most notable market in Norfolk and Suffolk was that of preserved fish (Hutchinson, 1994: 129). Great Yarmouth, in particular, became one of the major herring markets in Europe. English 'Doggers' of 30 to 40 tonnes, with crew of 20 to 30, began fishing in Icelandic waters from the 14th century onwards (Hutchinson, 1994: 57). These fleets acted in convoy throughout the 15th century, reaching a peak in the early 16th century (Marcus, 1954: 296).
- 12.9.24 The available archaeological and historical evidence indicates the development of a wide range of functional vessels during the medieval period associated with the increasing need for inexpensive and spacious cargo transporters and the need to defend these merchant vessels against piracy.
- 12.9.25 By the end of the medieval period the use of both clinker and carvel strakes as a construction technique (flush laid planking fixed to frames) became more common, with consistent use of more than a single mast, increased tonnages, incorporated deck levels and the development of reliable navigation techniques and aids facilitated an even greater expansion of the trade routes. This period also saw the advent of maritime exploration, through the greater use of flush laid strake built ships on a global scale as vessels from

Europe reached the New World and, subsequently, mapped the spice routes to the Far East.

12.9.26 However, while the design and construction of larger ships was becoming somewhat measured and standardised, the range and varieties of smaller, vernacular craft are likely to have remained extensive with the use of simple rafts and skin or hide covered boats as well as wooden vessels associated with transport and fishing, for example. The wide range of historical influences upon the design of such vessels, coupled with the specific requirements of the local environment, suggest that the number of vessels operating in the seas and rivers around Britain would have been numerous and diverse. Boats and ships from the Medieval and Early Tudor period are sufficiently rare that all examples are likely to be considered of special interest. The Early Ships and Boats project identified just 51 records with a date range that falls within the Medieval and Early Tudor period (1066 to 1540), comprising seven designated wrecks, 20 logboats (none of which were identified as surviving in an archaeological context), ten findspots, one historic vessel and 13 undesignated wrecks, a number of which are likely to post-date 1509 (Wessex, Archaeology 2013c: 34).

1509 to 1815 AD

12.9.27 In general terms, post-medieval shipwreck remains are better represented in the archaeological record than earlier periods although those subject to archaeological investigation are only a fraction of the numbers likely to have been lost. There are two reported wrecks from this period, located within the provisional OCC, dated to 1254 and 1315 (NHRE 1546047; 926650). Both consist of cargo vessels reported to have stranded near Bacton. However, there are no documented losses dating to this period. The absence of such records does not necessarily denote the absence of sites dating to this period within the study area.

12.9.28 Technological advances in the construction, fitting and arming of ships, and in navigation, sailing and steering techniques, continued into the post-medieval period. Shipbuilding of larger vessels continued to develop around the carvel and flush strake techniques while the form and construction of local craft remained diverse, continuing to incorporate traditions of earlier periods such as the clinker construction technique.

12.9.29 The great innovations in ship design during this period were stimulated by the development and growth of new trans-oceanic communication networks which saw the opening up of the New World. The late 15th and early 16th century voyages of exploration precipitated global mercantile trade and expansion and the emergence of the 'Golden Age' in northern Europe (Glete, 1999) with the establishment of the East India Company in 1599.

12.9.30 By the beginning of the 17th century the volume of trade, and the numbers of vessels involved in such trade, increased dramatically. The length of voyages, the hazards of trans-oceanic journeys and the requirements of trade saw the evolution of even larger vessels with round-bellied, capacious holds to accommodate more/larger cargo.

12.9.31 The East Coast played a key role in this 'Golden Age' with established overseas trade connections ranging from the Baltic Sea to the Iberian Peninsula and beyond (Williams, 1988: 70). By the late 18th century, statistics from the Lloyds Register of the English and Welsh regions (1776) attributed 10% of the total of shipbuilding tonnage to East Anglia (Stammer, 1999: 254). It is notable that at least ten of the 14 documented Recorded Losses dating to the 18th century within the area were cargo vessels, a testament of the growth in trade during this period.

- 12.9.32 Alongside this global growth of trade and prosperity came an increasing need to protect financial interests and from the 16th to mid-19th centuries the separation of merchant ships and ships built for fighting also became more marked. Fighting ships were designed to fight broadside to broadside with heavy ordnance. Battles at sea became larger and more destructive and a standing Royal Navy, established during the Tudor period, grew to become an established and organised force. The expansion of the Navy in the Tudor period also saw the opening of a network of royal dockyards.
- 12.9.33 The East Coast region was subject to three major battles during the 17th century (Wessex Archaeology, 2003). The Battle of Gabbard Shoal (1653), The Battle of Lowestoft (1665) and the Battle of Sole Bay (1672) formed part of the Anglo-Dutch wars in this region, a series of battles fought for control of the seas and trade routes rather than territory and marking a new era in the history of naval warfare. Twenty Dutch ships and two English vessels were lost during the Battle of Lowestoft with three Dutch ships and four ships from the combined English and French fleet lost at the Battle of Sole Bay. These warships are yet to be confidently located. It is thought that the battles took place further towards the coast rather than in the proximity of Norfolk Vanguard. Nonetheless, the location of these battles is not definitively understood and the potential for the remains of such vessels to exist within the study areas should not be discounted. As testament to this potential, between 2005 and 2016, 19 cannonballs were reported from the East Coast dredging region through the Marine Aggregates Protocol for Reporting Finds of Archaeological Interest (<http://www.arcgis.com/home/item.html?id=99a2073a1b874527865fb06bfde67552>).
- 12.9.34 In addition to this global explosion in trade and naval warfare, the East Coast economy was still underpinned by local trade and marine exploitation. The fishing industry continued to thrive with the developed quays of Southwold and Lowestoft and the established ports of Great Yarmouth and King's Lynn prospering following their expansion with the Icelandic cod fishing fleets during the mid-17th and 18th centuries (Gould, 1997), particularly with the development of deep sea fishing in the 19th century (Rasmussen, 1985: 217).
- 12.9.35 In the 18th century, East Anglia was at the forefront of the 'Agricultural Revolution' whereby communications were developed to serve the farming economy and to facilitate the diverse trade of Norfolk and Suffolk of which grain was the principal export (Gilman, 1997: 67).
- 12.9.36 Although there is significantly more historical data for maritime activities in this period, particularly with regard to East India Company shipping and naval warfare, the number of known wrecks from the 16th to early 19th centuries remain low in the archaeological resource, although a larger number of records relating to known sites exists in comparison to earlier periods. For example, the Early Ships and Boats project (Wessex Archaeology 2013c) identified 34 and 68 records with a date range that falls between the Mid to Late Tudor period (1540 to 1603) and the Stuart period (1603 to 1714) respectively, as well as an additional 145 with a date range falling within the Hanoverian period (1714-1837) (although a number of these will post-date 1815). Despite this, known examples of wrecks dating to this period are still rare in comparison to those post-dating 1840. Additionally, the smaller vessels and local craft employed in the day to day activities of coastal communities, and deployed as auxiliary vessels to the Royal Navy, are still comparatively absent from both the historical and archaeological record and discoveries are rare. Any wrecks from this period, therefore, will be of special interest.

1816 to 1913 AD

- 12.9.37 By the start of the 19th century, coastal and international trade were dominated by wooden sailing vessels, and the 'wooden walls' of the naval fleets during the French Revolutionary Wars represented the zenith of the naval sailing vessel (Lavery, 1991). However, during the course of the 19th century the technological innovations of the Industrial Revolution brought fundamental changes in maritime technology, which amongst other advances in naval engineering, enabled the development of steam propulsion, oil engines and iron and steel construction.
- 12.9.38 The use of iron in shipbuilding began during the 18th century but it wasn't until the first half of the 19th century that the technology came into widespread use. Initially, iron was used to supplement structural elements in shipbuilding although it was later used for angular joints or knees and the framing of vessels and ultimately replacing wood as the covering for the hull. Steel was used periodically for ship construction from the late 1850s but did not supersede iron until the later 19th century (Greenhill, 1993: 89; Ville, 1993: 52).
- 12.9.39 The first Atlantic crossing by a paddle steamer took place in May 1819 and by the 1820s steamboat transport formed an extensive network around the British Isles (Pearsall, 1985: 195). The high cost in coal consumption, however, limited their range and value to the trade economy and, as such, they were largely confined to the passenger trade where reliable quick passages were more important than cost (MacRae and Waine, 1990: 11). The introduction of the screw propeller began in the 1830s but it wasn't until the development of the compound engine in 1854 that vessels equipped with screw propulsion could truly compete with the sail.
- 12.9.40 The first steam powered naval vessel HMS *Agamemnon* was ordered by the Royal Navy in 1849 with the first iron naval ship HMS *Warrior* built in 1861 (www.royalnavy.mod.uk, accessed May 2017). Following a period of experimentation, designs were standardised by the 1890s with new steel battleships and the large armoured cruisers built to defend trade routes. The development of the torpedo, or mine, from early experiments in the 1860s saw the evolution of small and fast torpedo boats and, in response, heavily armed torpedo boat destroyers and led to the development of the submarine and ultimately the all-big-gun dreadnought battleships in the early 20th century.
- 12.9.41 The use of metal in shipbuilding increased both durability and capacity while the use of steam propulsion allowed for greater speed, thus facilitating the further growth of long distance trade. However, the transition was gradual with wooden sailing vessels such as schooners, brigs, brigantines and snows continuing to dominate until the second half of the 19th century and continuing in use well into the 20th century (Ville, 1993: 52). The use of wood in the construction of local craft also continued with new technologies contributing but rarely supplanting local maritime traditions and cultural values.
- 12.9.42 By the late 19th century a global network had been established linking the major cities of the world into an integrated global transport system. Coastal traffic also continued to grow during this period. The transport of coal was a major contributor to coastal trade with c. 22 million tons carried coastwise (Jackson, 1983: 117). The East Coast coal trade formed a large proportion of this, from the northern coalfields to the London market. Norfolk and Suffolk's principal export however was agricultural goods such as grain across the North Sea with the import of timber coming from Scandinavia and the Baltic.
- 12.9.43 The dominance of Great Yarmouth as a fishing port in the region continued into the 19th century, with the well-established herring stock exported on mass to the Mediterranean and Northern Europe. In the late 19th and early 20th century, the Yarmouth/Lowestoft autumn herring fishery was by far the biggest fishery on the East Coast.

- 12.9.44 The recording of shipping losses became more centralised in the late post-medieval period, and as such from this period onwards the available record of shipping casualties is both more complete and accurate. Wrecks dating to latter part of this period are also more likely to be visible in hydrographic surveys. With the use of metal in boat and ship construction becoming more common for wrecks of this period, their remains are often more evident on the seabed than their predecessors as their upstanding components are more clearly apparent to bathymetric and geophysical survey, and they generate strong magnetic anomalies. Metal wrecks were also considered to represent worse navigational hazards to shipping than their wooden counterparts and were recorded more scrupulously as a result. A number of recorded losses and geophysical anomalies within the study area have been identified and assigned to the date range 1816-1913.
- 12.9.45 In general terms, known wrecks identified as dating between 1816 and 1913 are more plentiful in the archaeological resource in comparison to those dating to earlier periods. This is particularly the case for wrecks dating from the mid-19th century onwards. While the Early Ships and Boats project identified 384 records in England's wreck resource from the prehistoric period to 1840 (Wessex Archaeology, 2013c), the Assessing Boats and Ships 1860-1913 project (Wessex Archaeology, 2011b) identified 518 wrecks in England's wreck resource dating to a 53 year period alone, spanning 1860 to 1913. Due to the number of records, for a wreck of this period to be of special interest, it is likely to have to make a distinctive contribution in respect of a number of integral factors. It must also be considered to have relative merit in comparison to other wrecks or surviving vessels of the period. The special interest of boats and ships of this period is likely to be multi-faceted. Consequently, any wrecks from this period that may be discovered within Norfolk Vanguard may only be of special interest if their remains can make a specific contribution to current knowledge and understanding.

1914 to 1945 AD

- 12.9.46 The East Coast was subject to a high level of hostility throughout both World Wars, with the East Anglian region providing a focus for military activity. The rapid technological advances of the preceding century facilitated the development of more homogenous naval fleets of larger, faster and more durable vessels, heavily armed and incorporating the widespread use of submarines.
- 12.9.47 A great number of vessels were lost during the World Wars, including both warships and submarines, but a much greater number of merchant vessels were lost as the disruption and destruction of shipping became an established military tactic (Firth, 2014). Large numbers of mines were laid by the Germans off the East Coast while German U-boats were engaged in unrestricted attacks on the British merchant fleet from September 1915 onwards within an 'unrestricted submarine warfare' zone surrounding the UK. At the height of the campaign, between February and April 1917, U-boats sank 500 merchant ships (Hewitt, 2008: 17).
- 12.9.48 During the war years the number of ships passing through the study area intensified as a result of increased demand for shipping to fulfil military requirements and to supply the wartime demands. For example, the East Coast trade route from the 'Great North Coalfield' was still the main supply line to London, which accounted for the single largest consumption for fuel in England (Hewitt, 2008: 7). To protect the maritime trade merchant fleets started operating in convoys escorted by minesweepers (Steffen, 2005: 802), and a great number of non-military vessels were requisitioned by the Royal Navy to support the war effort in this respect.



- 12.9.49 Convoys were also utilised in WWII in an attempt to transform the east coastal trade route into an indestructible highway (Hewitt, 2008: 17, 23). The main convoy route during WWII passed to the west of Norfolk Vanguard, between the Thames (Southend) to the Firth of Fort (Methil) or the Tyne. These convoy routes ran for the duration of the war between September 1939 and May 1945.
- 12.9.50 As in WWI, large numbers of steam trawlers and drifters were bought or hired by the Admiralty to supplement the Royal Navy's dwindling resources in WWII.
- 12.9.51 The advent of flight brought another dimension to 20th century warfare and the deployment of aircraft to destroy both merchant and military ships became a key strategy during WWII (Bowyer, 2003: 26). Alongside mines and submarines, aircraft posed a significant threat to shipping in WWII which was measurably enhanced as the accuracy and effectiveness of dive-bombing techniques increased (Whitley, 2002: 12). Three known records located within the provisional OCC refer to WWII ships sunk by German aircraft.
- 12.9.52 Dozens of vessels such as these were lost due to enemy action, some sunk by torpedoes or gunfire from submarines, with the additional threat of German motor torpedo boats, known as E-Boats and fighter/bomber aircraft (Larn and Larn, 1997). The distance between the coast of Norfolk and Suffolk and the coasts of German-occupied France and Holland was relatively short and ships were lost off Norfolk almost daily from 1939 to 1941.
- 12.9.53 The high levels of losses between 1914 and 1945, combined with the increased likelihood of discovering wrecks from this period through geophysical survey or historical accounts, means that only remains contributing to an understanding of technological changes and to local and global activities during this period are likely to be of special interest. However, many vessels of little archaeological value may have additional significance with regards to loss of life or through identifiable connections with significant events.

Post- 1946

- 12.9.54 Maritime activity within Norfolk Vanguard in the post-war era is multi-faceted, with the southern North Sea providing an arena for military, commerce, fishing and leisure activities. Although ships and boats are less numerous than in preceding years, the overall volume of seafaring activity continues to be very high (Wessex Archaeology, 2009: 61). Only remains of this period with unusual or specific potential to further understanding are likely to be regarded of special interest.



12.10 Appendix X: Maritime Recorded Losses

| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|--------------|--------------------|-------------------|--------------|---------------|-----------|--|
| NHRE 1546047 | | Unknown | Cargo Vessel | Medieval | 1254 | A cargo vessel reported to have stranded near Bromholm Priory, at Bacton, with her goods. This vessel may be identifiable with another vessel reported as wrecked 'near Great Yarmouth', also in November 1254 (1446402), but this cannot be confirmed given |
| NHRE 926650 | | Unknown | Cargo Vessel | Medieval | 1315 | A Flemish cargo vessel reported to have stranded near Broomholm on her passage from what is now Belgian Flanders for England, with a general cargo. She was a wooden sailing vessel. |
| NHRE 1216226 | | Unknown | Cargo Vessel | Post-medieval | 1762 | A cargo vessel reported to have stranded at Bacton while in ballast. She is recorded as a wooden sailing vessel. |
| NHRE 1319386 | | <i>Dolphin</i> | Cargo Vessel | Post-medieval | 1762 | An English cargo vessel reported to have stranded near Happisburgh, en route from Newcastle-upon-Tyne to London with coal. Recorded to have been a wooden sailing vessel. |
| NHRE 1355782 | | <i>Friendship</i> | Cargo Vessel | Post-medieval | 1762 | An English cargo vessel reported to have stranded at Bacton, en route from Riga with timber, masts and flax. Recorded to have been a wooden sailing vessel. |
| NHRE 1216246 | | <i>Providence</i> | Cargo Vessel | Post-medieval | 1762 | An English cargo vessel reported to have stranded at Bacton, en route from 'Cammis' to London with oats and butter. The vessel is recorded to have been a wooden sailing vessel. |
| NHRE 1320371 | | <i>Providence</i> | Cargo Vessel | Post-medieval | 1767 | An English cargo vessel reported to have stranded at Walcott, near Happisburgh, due to bad weather. She was bound from London northwards in ballast. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|--------------|--------------------|-------------------------|--------------|---------------|-----------|--|
| NHRE 927487 | | <i>HMS Peggy</i> | Sloop of War | Post-medieval | 1770 | An English sloop-of-war, built in 1749, reported to have stranded on Happisburgh Beach, en route from South Shields to Great Yarmouth with volunteer marines. She was a wooden sailing vessel. |
| NHRE 1311391 | | <i>Albion</i> | Brigantine | Post-medieval | 1774 | A British brigantine reported to have stranded near Yarmouth at Eccles-on-Sea. She was laden with coals from Shields to London. |
| NHRE 1327191 | | <i>Friendship</i> | Cargo Vessel | Post-medieval | 1786 | A Dutch or German wooden sailing vessel, reported to have stranded at Happisburgh, en route from Emden to London. |
| NHRE 1383833 | | <i>Supply</i> | Brigantine | Post-medieval | 1791 | An English brigantine reported to have stranded at Happisburgh, en route from King's Lynn to Caernarvon and / or Carmarthen with wheat, rye, barley, peas and malt. She is recored to have been a wooden sailing vessel. |
| NHRE 1336346 | | <i>Good Intent</i> | Craft | Post-medieval | 1792 | A British craft reported to have stranded on the shore near Happisburgh. She was heaing to Blyth from London. |
| NHRE 1336335 | | <i>Hoffnung</i> | Cargo Vessel | Post-medieval | 1792 | A Prussian wooden sailing vessel, reported to have stranded and bilged at Happisburgh, en route from Szczecin to London laden with barrel staves. |
| NHRE 1336459 | | <i>William</i> | Cargo Vessel | Post-medieval | 1793 | An English wooden sailing vessel, reported to have stranded and bilged at Happisburgh, en route from Klaipeda for Great Yarmouth laden with timber. |
| NHRE 1337878 | | <i>Two Brothers</i> | Cargo Vessel | Post-medieval | 1797 | A British cargo vessel reported to have stranded near Happisburgh, loaded with coal. |
| NHRE 1338047 | | <i>Peace And Plenty</i> | Cargo Vessel | Post-medieval | 1798 | An English cargo vessel reported to have stranded near Happisburgh, laden with coal. |
| NHRE 928052 | | <i>Comet</i> | Ketch | 19th century | 1880 | An English ketch reported to have stranded near Bacton beach. She was built in 1819 and had a total of four crew. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|--------------|--------------------|-----------------------------|----------------|--------------|-----------|---|
| NHRE 928047 | | <i>Emerald</i> | Ketch | 19th century | 1880 | An English ketch reported to have stranded at Bacton beach. She was built in 1816 and the total of 10 crew were lost during wrecking. |
| NHRE 1338880 | | <i>Kitty</i> | Brig | 19th century | 1802 | An English wooden sailing vessel, reported to have stranded at Bacton on her passage from Sunderland with coal. |
| NHRE 1376722 | | <i>Vrouw Cornelia</i> | Craft | 19th century | 1803 | A Dutch wooden sailing vessel, reported to have stranded at Bacton beach on her passage to London. |
| NHRE 1397863 | | Unknown | Brig | 19th century | 1807 | A wooden sailing vessel, reported to have stranded at Happisburgh during a gale. |
| NHRE 1397862 | | Unknown | Craft | 19th century | 1807 | A wooden sailing vessel reported to have stranded at Happisburgh during a gale, on her passage from Sunderland. |
| NHRE 928241 | NHER MNF18662 | <i>Hunter</i> | Sailing Vessel | 19th century | 1807 | A British revenue cutter reported to have stranded on the beach at Happisburgh after grounding on Haisborough Sand during a gale. |
| NHRE 1397860 | | <i>Margaret</i> | Cargo Vessel | 19th century | 1807 | An English wooden sailing vessel reported to have stranded at Happisburgh during a gale. |
| NHRE 1341255 | | <i>Fame</i> | Craft | 19th century | 1809 | A wooden sailing vessel reported to have stranded on Happisburgh Beach. |
| NHRE 1341256 | | <i>Royal Merchant</i> | Cargo Vessel | 19th century | 1809 | An English wooden sailing vessel reported to have stranded on Happisburgh Beach. |
| NHRE 1341806 | | <i>Prince William Henry</i> | Cargo Vessel | 19th century | 1810 | A British wooden sailing vessel, reported to have stranded on Happisburgh beach on her passage from Great Yarmouth in ballast. |
| NHRE 1218611 | | <i>Maria</i> | Cargo Vessel | 19th century | 1812 | An English wooden sailing vessel reported to have stranded on Happisburgh Beach on her passage from Newcastle-upon-Tyne with coal. |
| NHRE 1343379 | | <i>Hopewell</i> | Cargo Vessel | 19th century | 1814 | A British cargo vessel reported to have run ashore at Bacton, near Mundesley, from London to Leeds. |
| NHRE 1343486 | | <i>Verandering</i> | Cargo Vessel | 19th century | 1814 | A Dutch cargo vessel reported to have stranded near Bacton at Hasbro'. She was from Embden, laden with oasts. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|--------------|--------------------|---------------------|--------------|--------------|-----------|---|
| NHRE 1344193 | | <i>Benjamin</i> | Craft | 19th century | 1815 | A British craft reported to have stranded near Happisburgh, from Sunderland. |
| NHRE 1345333 | | <i>Thomas</i> | Cargo Vessel | 19th century | 1817 | An English cargo vessel reported to have run ashore near Bacton. The vessel with 'THOMAS of Boston, William Fowel', painted on the stern, contained several packing cases, and a quantity of oats. |
| NHRE 1315686 | | Unknown | Craft | 19th century | 1824 | Two crafts were reported to have stranded at Happisburgh. Both vessels were driven ashore due to bad weather. One consisted of a barge 'Alexander' (NHRE 1315682). |
| NHRE 1315682 | | <i>Alexander</i> | Barge | 19th century | 1824 | An English barge reported to have stranded at Happisburgh. She was bound to London from Hull with flagstones and cement. |
| NHRE 1351795 | | <i>Barton</i> | Craft | 19th century | 1824 | An English craft reported to have stranded north of Happisburgh, due to severe gale winds. |
| NHRE 1236794 | | <i>Huddersfield</i> | Cargo Vessel | 19th century | 1827 | A British cargo vessel reported to have run ashore near Happisburgh, from London. |
| NHRE 1315958 | | Unknown | Smack | 19th century | 1829 | A boat supposed to be a smack's, drifted on shore near Bacton, very likely all crew were lost. |
| NHRE 1237163 | | <i>Ocean</i> | Brig | 19th century | 1830 | An English wooden sailing vessel reported to have stranded on Bacton beach after springing a leak, having just delivered her cargo at Mundesley, i.e. she was now in ballast. She began her voyage at Newcastle-upon-Tyne laden with coal. |
| NHRE 1237913 | | <i>Hercules</i> | Craft | 19th century | 1832 | A craft, en route from Rotterdam, reported to have stranded near Hasbro' Lights, Happisburgh beach. |
| NHRE 927864 | | <i>Autumn</i> | Snow | 19th century | 1854 | An English snow reported to have stranded near Bacton. Having sprung a leak at sea in gale wind conditions the vessel was run on shore in a sinking condition and soon broke up, being very old. The crew were saved by the Bacton lifeboat. The vessel was insured at Lloyd's. She was built in 1790 at Whitby, with iron bolts. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|--------------|--------------------|--------------------|----------------|--------------|-----------|---|
| NHRE 1489537 | | <i>Quicksilver</i> | Cargo Vessel | 19th century | 1858 | An English wooden sailing vessel reported to have foundered off Happisburgh after a collision, en route from Sunderland to London. |
| NHRE 927930 | | <i>Princess</i> | Smack | 19th century | 1866 | A British smack reported to have stranded near Happisburgh. She was built in 1865 and out of a total of six crew, one was lost during wreckage. |
| NHRE 927933 | | <i>Thomas</i> | Sloop | 19th century | 1866 | A British slopp reported to have stranded near Watch House, a quarter of a mile north of Bacton. She was built in 1857 and a the total crew of three were lost during the wreck. |
| NHRE 1223030 | | <i>Edith</i> | Schooner | 19th century | 1884 | An English Schooner reported to have stranded at Happisburgh. She was built in 1858 at Padstow, and the total crew of five were lost during wrecking. |
| NHRE 928459 | | <i>Myth</i> | Fishing Vessel | 19th century | 1885 | An English Dandy reported to have stranded at Bacton beach. She was built in 1870 and from a total of 13 crew, one was lost during the wrecking. |
| NHRE 928485 | | <i>Aerial</i> | Brig | 19th century | 1886 | An English brig reported to have stranded at Bacton beach, due to bad weather. She was built in 1839 at Newcastle-on-Tyne. |
| NHRE 1223358 | | <i>Hilda</i> | Fishing Vessel | 19th century | 1886 | An English Dandy reported to have stranded off Happisburgh beach due to bad weather. |
| NHRE 928672 | | <i>Lively</i> | Schooner | 19th century | 1888 | An English schooner reported to have stranded at Walcott Gap, near Happisburgh. |
| NHRE 1349732 | | <i>Flora</i> | Schooner | 19th century | 1892 | A German schooner reported to have stranded and lost at Bacton due to bad weather. She was built in 1858. |
| NHRE 1348480 | | <i>Lively Oak</i> | Schooner | 19th century | 1893 | An English schooner reported to have stranded at Bacton beach. She was built in 1868. |
| NHRE 928329 | | <i>Mayland</i> | Ketch | 19th century | 1897 | An English ketch reported to have foundered at Happisburgh, following a collision with the wooden brig Canadian, of Sunderland. She was built in 1868 and had a total crew of four. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|---------------|------------------------------|--------------------|----------------|--------------|-----------|--|
| NHRE 928339 | | <i>Vedra</i> | Snow | 19th century | 1897 | An English snow reported to have stranded near Bacton beach. She was built in 1861 in Sunderland. Out of a total of seven crew, three were lost. |
| UKHO 69837 | | <i>Seymolicus</i> | Fishing Vessel | WWI | 1914 | Recorded by UKHO as <i>Seymolicus</i> , a wooden fishing vessel, mined and sunk 18/11/1914. Wreck amended to dead in 1988. Feature not identified on the geophysical data. |
| UKHO 11145 | | <i>Young Frank</i> | Fishing Vessel | WWI | 1915 | Recorded by UKHO as <i>Young Frank</i> , a fishing vessel, bombed and sunk by a submarine 23/08/1915. Wreck amended to dead in 1994. Nothing anthropogenic identified on the geophysical data. |
| NRHE 892290 | UKHO 10572; NHER MNF38251 | <i>Unknown</i> | Unknown | Modern (WWI) | Unknown | Recorded by UKHO in 1948 as the remains of an old war wreck in the intertidal area. NHER data describes it as a WWI wreck of unknown name marked on an Admiralty Chart in 1957. Nothing found in 1983 and not seen in the 2016 geophysical data. |
| NHER MNF18663 | | <i>Unknown</i> | Unknown | Modern (WWI) | Unknown | NHER data describes a WWI wreck of unknown name marked on Admiralty Charts in 1957. Not seen in the 2016 geophysical data. |
| UKHO 69079 | | <i>Quest</i> | Fishing Vessel | WWI | 1915 | Recorded by UKHO as <i>Quest</i> , a fishing vessel reported sunk 30/07/1915. Not observed at this location. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|----------------------|--------------------|--------------------------------|----------------|---------|-----------|--|
| NHRE 1349364 | UKHO 11135 | <i>Lembit</i> | Schooner | Modern | 1916 | An English schooner reported to have stranded on Happisburgh beach on a northbound voyage from Gravesend with burnt ore. She was constructed of wood in 1892, and built as a sailing vessel. Subsequent attempts to locate the wreck were unsuccessful despite intensive sonar and echo sounder surveys. The wreck continued to be charted on Dutch fisheries charts dated to 1972, although its remains were still not found during a full search of the area. This wreck has since been amended to dead. |
| NHRE 929125 | | <i>Enterprise</i> | Barge | Modern | 1917 | An English wooden sailing barge, reported to have stranded at Happisburgh beach. She was built in 1891 in Great Yarmouth, fitted with three masts, one deck and screw driven with an oil engine. |
| UKHO 11151 and 11152 | | <i>Nelson, Ethel And Milly</i> | Unknown | WWI | 1917 | UKHO provides two different records and wreck numbers at the same location; that of <i>Nelson, Ethel and Milly</i> . Reported as being torpedoed by a submarine and sunk 15/08/1917. Nothing identified on the geophysical data. Both have been amended to dead wrecks. |
| NHRE 929136 | | <i>Clansman</i> | Cargo Vessel | Modern | 1924 | A British cargo vessel reported to have stranded 3 miles northeast of Happisburgh Lighthouse. It was built in Belfast by Clark & Co., screw driven and propelled by a two cylinder compound engine. |
| UKHO 11102 | | <i>Boy Edward</i> | Fishing Vessel | Modern | 1930 | Reported by UKHO as <i>Boy Edward</i> , a fishing vessel reported sunk 05/11/1930. Not observed at this location. |
| UKHO 10558 | | <i>Nimrod</i> | Unknown | Modern | 1975 | Recorded by UKHO as <i>Nimrod</i> which ran aground in 1975 near Happisburgh. Nothing identified in 1983 and not seen in 2016 geophysical data. |
| UKHO 10897 | | <i>Beaver</i> | Unknown | Unknown | Unknown | Recorded by UKHO as <i>Beaver</i> , a wreck which was amended to lifted in 1995. |



| ID | Other Data Sources | Name | Type | Period | Year Lost | Description |
|------------|--------------------|---------|-------------|---------|-----------|--|
| UKHO 11105 | | Unknown | Unknown | Unknown | Unknown | An unknown wreck, first reported in 1916. The original source identifying the location of the wreck is unknown, although available evidence suggests that no geophysical signature has been associated with this site to date. Attempts to locate the wreck in subsequent surveys were unsuccessful and this wreck was amended to dead. No geophysical anomaly observed in 2013 data or in previous zoning assessment. The record was last amended in 2014 but no additional surveying details were added. |
| UKHO 11107 | | Unknown | Unknown | Unknown | Unknown | An unknown wreck, first reported in 1921. The wreck was initially observed as being charted on German and Dutch shipping charts. However, subsequent attempts to locate the wreck were unsuccessful despite intensive sonar and echo sounder searches. The wreck site was amended to dead in 1969, although it continued to be charted on Dutch fisheries charts dated to 1972. No geophysical anomaly was observed in 2013 data or in the previous zoning assessment. The record was last amended in 2014 but no additional surveying details were added. |
| UKHO 10572 | | Unknown | Unknown | Unknown | Unknown | Recorded by UKHO in 1948 as the remains of an old war wreck in the intertidal area. Nothing found in 1983 and not seen in the 2016 geophysical data. |
| UKHO 10766 | | Unknown | Foul Ground | Unknown | Unknown | Recorded by UKHO as foul ground. First identified in 1987 described as a pile of debris. Not located in 2014 and nothing seen in the 2016 geophysical data. |

12.11 Appendix XI: Aviation Archaeological Potential

Introduction

- 12.11.1 A guidance note published by English Heritage (now Historic England) entitled *Military Aircraft Crash Sites* (2002) outlined a case for recognising the importance of aircraft crash sites, specifically with regard to existing and planned development proposals which may have an impact on such sites. The guidance note argues that aircraft crash sites not only have significance for remembrance and commemoration, but they also have an implicit cultural value as historic artefacts, providing information on the aircraft itself and also the circumstances of its loss (*ibid.*: 2). All aircraft that crashed while in military service are automatically protected under the Protection of Military Remains Act 1986.
- 12.11.2 Site survival is largely determined by the cause of loss. With a few exceptions, aircraft come to be on the seabed as a result of an in-flight accident or enemy action and remains are often highly fragmented and widely dispersed as a result of mid-air explosion or the high impact of hitting the water at speed. Aircraft which come to rest on the seabed as a result of controlled ditching are more likely to be better preserved. The factors which determine the survival of an aircraft crash site are not yet fully understood although marine environments generally offer favourable conditions for the preservation of artefacts, enhancing the potential for the survival of aircraft crash sites on the seabed.
- 12.11.3 There is potential for aircraft crash sites dating from the early 1900s to the present day to be present within the study area, and this potential is discussed below.

Pre-1939

- 12.11.4 There are no known or charted aircraft or documented losses dating to this phase within the study area.
- 12.11.5 Fixed wing-aviation first began in the early 1900s in the UK, with the first flight across the English Channel in 1909. This early period was characterised by the intense and rapid development of a new technology, from the advent of powered flight to the outbreak of WWII. At least 119 different aircraft models were used by the military in the UK during this period but examples of only 24 survive today anywhere in the world. This, alongside the fragility of the airframes and the relative scarcity of flights over water mean that any aircraft remains dating to this period will be of special interest.
- 12.11.6 Early aircraft were constructed of canvas covered wooden frames and were extremely fragile, and it was not uncommon for such an aircraft to break up in flight. The regular use of aircraft over the battlefields of the Western Front by the end of WWI, however, prompted the mass-production of fixed wing aircraft in large numbers, spurring technological advances in aircraft design.
- 12.11.7 A total of 28 fixed wing aircraft and 15 airships were lost by the German Imperial Air Service and Navy during raids on the UK mainland during WWI (Wessex Archaeology, 2009: 65) and a further 34 aircraft from the British Home Defence Squadrons are also recorded to have been lost during this period (Holyoak, 2002: 659). It is possible that some of these losses occurred at sea, particularly within regions that attracted intense aircraft hostility such as the East Coast. WWI airfields in the area include RAF/RNAS Bacton, in use between 1915 and 1919, that was built to accommodate aircraft from the No. 219 Squadron intercepting Zeppelin bombers.
- 12.11.8 During the interwar period, civil aviation increased significantly, with overseas services established to a number of European and worldwide destinations (Wessex Archaeology 2009: 16). The Department of Transport's Air Accident Investigation Branch (AAIB)

records 20 civil aircraft losses at sea between 1920 and 1939, though this is not regarded as being a comprehensive record (Wessex Archaeology 2009: 65).

- 12.11.9 By the outbreak of WWII, low-powered wood and cloth biplanes had been replaced by high-powered monoplanes made of aluminium (Wessex Archaeology, 2009: 65). Civil aviation also increased significantly during the 1920s and 1930s, with over-seas services established to a number of European and worldwide destinations (Wessex Archaeology, 2009: 16).
- 12.11.10 Pre-1939 aircraft crash sites at sea are likely to be relatively rare, and the lightweight construction of the earlier airframes means that they are less likely to survive within the marine environment unless buried within seabed sediments. Any early aircraft crash sites from this period are likely to be important if discovered.

1939 to 1945

- 12.11.11 This period is characterised by technological innovations which extended the reliability and range of aircraft and the deployment of aircraft as a key strategy during WWII. Aircraft activity increased dramatically during this time and the highest potential for aircraft material on the seafloor is from this period. By WWII, aircraft were more heavily built and therefore material from their crash sites is more likely to survive in the archaeological record.
- 12.11.12 During WWII airpower became increasingly important at a strategic and operational level. Forming the frontier between the Allies and Axis, the North Sea became a significant focus for a high volume of aviation activity in WWII with hostile aircraft activity particularly concentrated off the east and south coasts of England (Wessex Archaeology, 2008: 16). During the Blitz, Great Yarmouth suffered more bombing than any other coastal town in the country.
- 12.11.13 The loss of aircraft from both sides during the war was immense and it is estimated that an average of five aircraft crashed every day between 1939 and 1945 somewhere in the British Isles (Bédoyère, 2001: 8). Many of these casualties are likely to have occurred offshore. Several airfields were located in proximity to the proposed project landfall indicating the concentration of aircraft movement over this region would have been high. These included RAF Matlaske, RAF Oulton, RAF Foulsham, RAF Coltishall, and RAF Ludham. Two RAF airfield decoys were also located in proximity to these airfields and indicate the lengths taken to protect this vulnerable coastline.
- 12.11.14 The *Aircraft Crash Sites at Sea* project (ALSF 5223; Wessex Archaeology, 2008) considered a selection of sources which may be considered to indicate the potential for aircraft remains of this period to exist within the study area. One of the most complete sources of information was provided by published aviation researcher Ross McNeill, who identified 11,090 RAF aircraft losses in the North Atlantic, North Sea, English Channel, Irish Sea and Biscay areas between 1939 and 1990, the majority of which occurred in WWII (Wessex Archaeology, 2008: 18). Of these, 217 are thought to have occurred off the coast of Norfolk. While Wessex Archaeology cannot verify the accuracy of the data supplied by McNeill, it was collated through a systematic study based on both primary and secondary sources and suggests a high volume of potential aircraft crash sites within the study area.
- 12.11.15 A further survey of crash sites in England, carried out by English Heritage in consultation with the MoD as part of the Monuments Protection Programme (MPP), revealed that WWII losses tended to cluster along the southern and eastern margins of England. The study suggested that c. 1,000 British aircraft were lost off the coast of



Suffolk (English Heritage, 2002: 5). Located beneath flight paths of enemy bomber formations from the Continent to the East Coast, the skies above the study area are likely to have been a focus for air combat during WWII.

- 12.11.16 There are three WWII aircraft casualties whose records place them within the study area (NHRE 1327660; NRHE 1318577; and NHER MNF17517). The NRHE records consist of British bombers reported to have crashed near Happisburgh. The NHER record refers to a German bomber with twin radial engines, whose remains were discovered by divers in 1981 offshore east of Happisburgh Church. Two geophysical anomalies are located close to the given position (**71080** and **71088**), however they indicate isolated pieces of debris that do not suggest aircraft remains. Therefore, it is likely that either the aircraft has dispersed from the area or the position is inaccurate and as such the record has not been ascertained at the location through the geophysical survey assessment, resulting in it being referred to as a Recorded Loss.
- 12.11.17 Analysis of maps showing the location of WWII Air/Sea Rescue Operations that took place within the vicinity of the study area indicated that there were at least 18 recorded Air/Sea Rescue Operations (sporadically recorded between February 1941 and March 1945), nine of which were recorded as unsuccessful. However, the mapped location of these operations is not necessarily reliable, rather, the locations provide a useful guide to the general distribution, and suggest the potential for discovery of aircraft crash sites in the study area.
- 12.11.18 This evidence demonstrates a high potential for the presence of WWII aircraft remains to exist within the project area. As outlined above, all aircraft that crashed while in military service are automatically protected under the Protection of Military Remains Act 1986, and all remains of aircraft from this date will be of high importance.

1945 to Present

- 12.11.19 From the end of WWII until the early 1990s, military aviation activity was dominated by the Cold War. During this period, aircraft research, design and development further increased to the benefit of both the military and commercial sector. Developments in aerospace engineering, a term coined in 1958 to encompass aircraft and spacecraft technology, saw the refinement of the jet engine which in turn enabled the production of the jet aircraft. The jet aircraft was much faster than its propeller-powered predecessors and was able to attain a greater altitude, providing maximum efficiency over long distances (Jarrett, 2000).
- 12.11.20 The growth of commercial aviation in the post-war years saw that flight soon became an available means of travel within and around the UK for most people and the volume of airliner activity across the study area is likely to have been considerable. However, despite the volume of aviation activity in the skies over the UK, there have been very few major losses. The Air Accidents Investigations Branch (AAIB) lists 120 civil aircraft losses at sea around the UK between 1946 and 1994, most of which comprise light aircraft or in more recent years, helicopters associated with the North Sea oil and gas industry (Wessex Archaeology, 2009: 68). Unlike in preceding years, the majority of military aircraft losses are due to training accidents rather than combat operations (Wessex Archaeology, 2009: 66).



12.12 Appendix XII: Aviation Recorded Losses

| ID | Name | Type | Period | Year Lost | Description |
|---------------|-----------------------|--------|--------|-----------|--|
| NRHE 1327660 | Wellington MK I L4257 | Bomber | WWII | 1939 | A British bomber reported to have flown into the sea in bad weather, 5 miles south-east of Happisburgh Light Vessel. It was built in Weybridge by Vickers and consisted of an MK I heavy bomber, one of a batch of 175. |
| NRHE 1318577 | Hampden MK I P1321 | Bomber | WWII | 1940 | A British bomber reported to have stranded near Happisburgh. It was a Mk I medium bomber, one of a batch of 200 standard Bomber Command aircraft. It was damaged by flak over Castrop-Rauxel, Germany, and crash landed on the beach near Happisburgh. |
| NHER MNF17517 | Unknown | Bomber | WWII | 1940 | Aircraft crash site, consisting of a German bomber with an intact twin radial engine, located off the coast of Happisburgh. Remains were discovered by divers in 1981 although the position provided is inaccurate and has not been confirmed since. |



12.13 Appendix XIII: Intertidal Heritage Assets

Co-ordinates are in ETRS89 UTM Zone 31N.

| WA ID | Site Type | Description | Period | NRHE / NHER | Easting | Northing |
|-------|-----------|---|--------------|---------------|---------|----------|
| 1001 | Findspot | Prehistoric flint flake. | Prehistoric | NHER MNF46197 | 401797 | 5853261 |
| 1002 | Findspot | Prehistoric flint flake. | Prehistoric | NHER MNF46198 | 401845 | 5853227 |
| 1003 | Findspot | Prehistoric flint core. | Prehistoric | NHER MNF46202 | 401868 | 5853208 |
| 1004 | Findspot | Prehistoric flint flake. | Prehistoric | NHER MNF46203 | 401897 | 5853192 |
| 1005 | Findspot | Prehistoric flint scraper. | Prehistoric | NHER MNF46207 | 401825 | 5853256 |
| 1006 | Findspot | Prehistoric flint scraper. | Prehistoric | NHER MNF46206 | 401531 | 5853606 |
| 1007 | Findspot | Flint flake. | Prehistoric | NHER MNF46200 | 402166 | 5853026 |
| 1008 | Findspot | Two prehistoric flint artefacts. | Prehistoric | NHER MNF18837 | 401802 | 5853345 |
| 1009 | Findspot | Lower Palaeolithic flint hand axe. | Palaeolithic | NHER MNF44878 | 402101 | 5853111 |
| 1010 | Findspot | Lower Palaeolithic lithic working and butchery site, comprising over 200 worked flints, environmental evidence. | Palaeolithic | NHER MNF39512 | 401935 | 5853311 |
| 1011 | Findspot | Palaeolithic flint handaxe. | Palaeolithic | NHER MNF31462 | 401299 | 5853891 |
| 1012 | Findspot | Palaeolithic flint handaxe. | Palaeolithic | NHER MNF31657 | 400961 | 5854205 |
| 1013 | Findspot | Two Lower Palaeolithic flint handaxes. | Palaeolithic | NHER MNF40679 | 401096 | 5854131 |
| 1014 | Findspot | Palaeolithic handaxe and two flakes and three cores. | Palaeolithic | NHER MNF62113 | 401008 | 5854152 |
| 1015 | Findspot | Lower Palaeolithic flint handaxe. | Palaeolithic | NHER MNF62279 | 401428 | 5853767 |
| 1016 | Findspot | Palaeolithic flint handaxe. | Palaeolithic | NHER MNF8369 | 403207 | 5852225 |
| 1017 | Findspot | Early hominin footprints dating to Early Pleistocene and early Middle Pleistocene. Flint objects and cut-marked bones have also been found associated with environmental remains. | Palaeolithic | NHER MNF66407 | 401289 | 5853867 |
| 1018 | Findspot | Primary Palaeolithic flint flake. | Palaeolithic | NHER MNF28062 | 402030 | 5853253 |
| 1019 | Findspot | Palaeolithic flint handaxe. | Palaeolithic | NHER MNF58130 | 402691 | 5852616 |
| 1020 | Findspot | Lower Palaeolithic flint handaxe. | Palaeolithic | NHER MNF62276 | 401346 | 5853826 |
| 1021 | Findspot | A Palaeolithic flint handaxe found on beach at high water line in 1975. | Palaeolithic | NRHE 133942 | 403205 | 5852222 |
| 1022 | Findspot | A Palaeolithic handaxe found in 1978 on Happisburgh beach, near the Lifeboat station. | Palaeolithic | NRHE 1230284 | 401430 | 5853769 |



| WA ID | Site Type | Description | Period | NRHE / NHER | Easting | Northing |
|-------|-----------|---|-----------------------------|------------------------------|---------|----------|
| 1023 | Findspot | A Palaeolithic handaxe found on Happisburgh beach in 1995. | Palaeolithic | NRHE 1230286 | 401337 | 5853875 |
| 1024 | Findspot | A Palaeolithic handaxe found on Happisburgh beach in 1995. | Palaeolithic | NRHE 1230287 | 400959 | 5854202 |
| 1025 | Findspot | A Palaeolithic flint implement found in the parish of Happisburgh. | Palaeolithic | NRHE 619088 | 401993 | 5853228 |
| 1026 | Findspot | A Neolithic polished flint axehead found in 1951. | Neolithic | NRHE 133662; NHER MNF7080 | 398765 | 5856218 |
| 1027 | Findspot | Neolithic polished flint axehead. | Neolithic | NHER MNF20919 | 400187 | 5855030 |
| 1028 | Findspot | Two Neolithic polished flint axeheads. | Neolithic | NHER MNF41193 | 401617 | 5853569 |
| 1029 | Findspot | Neolithic flaked flint axe. | Neolithic | NHER MNF62280 | 401578 | 5853559 |
| 1030 | Findspot | Multi-period finds. | Neolithic - post-medieval | NHER MNF68884 | 401653 | 5853416 |
| 1031 | Findspot | Multi-period objects, coins and pottery sherds. | Prehistoric - post-medieval | NHER MNF54968 | 400960 | 5854052 |
| 1032 | Findspot | Prehistoric, Roman, medieval and post-medieval finds. | Prehistoric - post-medieval | NHER MNF57872 | 401603 | 5853585 |
| 1033 | Findspot | Multi-period finds. | Prehistoric - post-medieval | NHER MNF44734 | 402020 | 5853226 |
| 1034 | Findspot | Blade fragment of a leaf shaped sword. | Bronze Age | NHER MNF18519 | 402009 | 5853150 |
| 1035 | Findspot | Copper alloy flanged axehead found on Happisburgh beach. | Bronze Age | NHER MNF38613 | 401923 | 5853347 |
| 1036 | Chapel | Site of Primitive Methodist chapel built in 1883. Three-bay gabled front with serrated brick cornices. Two round-arched windows flank a central window. | 19th century | NRHE 1494240 | 403198 | 5853555 |
| 1037 | Findspot | Early Saxon silver pyramid mount with garnet. | Medieval | NHER MNF56876 | 401923 | 5853347 |
| 1038 | Findspot | Medieval gold ring dating to the late 12th or 13th century. | Medieval | NHER MNF50467 | 401847 | 5853310 |
| 1039 | Findspot | Medieval coin, possibly a groat of Edward III. | Medieval | NHER MNF19144 | 401334 | 5853818 |
| 1040 | Findspot | Medieval harness pendant and coin of Charles I. | Medieval | NHER MNF38365 | 399082 | 5855800 |
| 1041 | Findspot | Gold coin, Edward IV. | Medieval | NHER MNF17121 | 397417 | 5857267 |
| 1042 | Findspot | Medieval coin, Jean I of Brabant. | Medieval | NHER MNF13733 | 399019 | 5856003 |
| 1043 | Findspot | Medieval coin, copy of sterling groat. | Medieval | NHER MNF23058 | 400421 | 5854772 |
| 1044 | Well | The site of a square timber framed well, exposed by erosion in 1947. Its base was excavated in August 1948 and contained 13th century pottery. Finds in Norwich Museum. | Medieval | NRHE 133669; NHER MNF7085 | 399995 | 5855171 |



| WA ID | Site Type | Description | Period | NRHE / NHER | Easting | Northing |
|-------|------------------|--|------------------------|--------------------------------|---------|----------|
| 1045 | Lighthouse | Happisburgh Low Lighthouse was one of two lighthouses erected in Happisburgh in 1791. By 1886 the lighthouse had fallen, probably as a result of coastal erosion. In 1980, when recorded by the RCHME, remains of part of the foundations still survived <i>in situ</i> but the majority of the remains lay on the beach or had been covered by sand. | Post-medieval | NRHE 524226; NHER MNF15435 | 402104 | 5853068 |
| 1046 | Findspot | Post-medieval coin, George I. | Post-medieval | NHER MNF22617 | 401759 | 5853448 |
| 1047 | Well | Flint and brick-lined well, now demolished. | Post-medieval | NHER MNF38949 | 401623 | 5853508 |
| 1048 | Sea defence | Posts from a 19th century breakwater visible on aerial photographs. | Post-medieval | NHER MNF45564 | 401322 | 5853886 |
| 1049 | Sea defence | Line of posts possibly representing a former groyne or sea defence. | Post-medieval | NHER MNF46053 | 403326 | 5852149 |
| 1050 | Brickyard | Site of brickyard that has since been eroded away. | Post-medieval | NHER MNF46986 | 399700 | 5855387 |
| 1051 | Road | An undated road from a map dating to 1797. It has since been destroyed by coastal erosion. | Post-medieval | NHER MNF7087 | 399896 | 5855268 |
| 1052 | Drain | Drain eroding from Happisburgh cliffs, subsequently destroyed. | Post-medieval - modern | NHER MNF64669 | 401602 | 5853541 |
| 1053 | Sea defence | Line of concrete or stone blocks, possibly early sea defences, possibly dating to the late 19th/early 20th century | Post-medieval - modern | NHER MNF44671 | 399563 | 5855489 |
| 1054 | Structure | Intertidal structure visible on aerial photographs taken in 1940; possibly related to WWII training or construction of coastal defences. It is possible that the remains relate to a wreck site that is no longer visible. | Post-medieval - modern | NHER MNF44454 | 400056 | 5855159 |
| 1055 | Structure | Intertidal structure visible on aerial photographs taken in 1940; possibly related to WWII training or construction of coastal defences. It is possible that the remains relate to a wreck site that is no longer visible. | Post-medieval - modern | NHER MNF44455 | 401360 | 5853919 |
| 1056 | Anti-tank blocks | WWII anti-tank blocks are situated in the vicinity of Cart Gap to the north of Eccles-on-Sea. The anti-tank blocks were built of concrete and were constructed during the period of 1940 to 1941. At the time of a field visit between 1986 and 1988 it was noted that the blocks had tumbled over. During the WWII their purpose were to block vehicular access through the Cart Gap. | Modern (WWII) | NRHE 1425416; NHER MNF44616 | 402742 | 5852566 |



| WA ID | Site Type | Description | Period | NRHE / NHER | Easting | Northing |
|-------|-------------------|---|---------------|---|---------|-------------|
| 1057 | Anti-tank blocks | Five WWII anti-tank blocks along Walcott beach. | Modern (WWII) | NRHE 1417005; NHER MNF32635 | 398867 | 5856101 |
| 1058 | Artillery battery | A WWII Coast Artillery Battery is situated on Happisburgh beach and about 38 metres northeast of Beach Road. The battery was built of concrete and was constructed during the period of 1940 to 1941. The battery is equipped with mounting for two six-inches guns. In addition, there remains a slight section of semi-circular tunnel jetting out from the cliff to the east of the life boat station. The coast battery was abandoned in the late 1940s as the 4.7 inches Happisburgh Emergency Coast Battery became operational (see NRHE 1416985). At the time of a field visit on 30th October 1994 it was noted that the remains of the battery were in very bad condition and are threatened by coastal erosion. | Modern (WWII) | NRHE 1416996; NHER MNF32636; NHER MNF44679 | 401521 | 5853642 |
| 1059 | Machine gun post | A WWII machine gun post is situated in the vicinity of Cart Gap to the north of Eccles-on-Sea. The gun post was built of brick and was constructed during the period of 1940 to 1941. The polygonal structure was built into the cliff and is presumed to be a purpose-built machine gun post. At the time of a field visit between 1986 and 1988 it was noted that the structure was in fair condition. | Modern (WWII) | NRHE 1425414; NHER MNF44616 | 402758 | 5852583 |
| 1060 | Pillbox | A WWII War polygonal pillbox is situated in the vicinity of Cart Gap to the north of Eccles-on-Sea. The pillbox was built of reinforced concrete and brick and was constructed during the period of 1940 to 1941. At the time of a field visit between 1986 and 1988 it was noted that the pillbox had tumbled over the cliff and its condition was very bad. | Modern (WWII) | NRHE 1425415; NHER MNF44616 | 402749 | 5852575 |
| 1061 | Pillbox | The former site of a WWII pillbox is situated in the vicinity of Walcott Gap at Walcott. The pillbox was built of reinforced concrete and was constructed during the period of 1940 to 1941. At the time of a field visit between 1986 and 1988 it was noted that the pillbox had been destroyed due to sea erosion and sea defence works. The pillbox had been seen on a postcard dating to 1955, depicting it <i>in situ</i> in the early 1950s. | Modern (WWII) | NRHE 1425466; NHER MNF44725 | 399069 | 5855836.441 |



| WA ID | Site Type | Description | Period | NRHE / NHER | Easting | Northing |
|-------|------------------|--|---------------|---------------|---------|----------|
| 1062 | Military Defence | WWII barbed wire obstructions and possible weapons pits, visible on aerial photographs | Modern (WWII) | NHER MNF44670 | 402233 | 5852925 |
| 1063 | Military Defence | Site of barbed wire obstructions and two pillboxes. | Modern (WWII) | NHER MNF44674 | 401663 | 5853406 |
| 1064 | Military Defence | WWII coastal defences visible on aerial photographs, comprising barbed wire obstructions, anti-tank cubes and a pillbox. | Modern (WWII) | NHER MNF44715 | 399852 | 5855152 |
| 1065 | Military Defence | WWII coastal defences, including anti-tank ditches, anti-tank cubes, barbed wire and pillboxes | Modern (WWII) | NHER MNF45206 | 397981 | 5856734 |