BERWICK BANK WIND FARM

OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT

MARINE ARCHAEOLOGY TECHNICAL REPORT

EOR0766
Marine Archaeology
Technical Report
Final

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CONTENTS

TABLES

FIGURES

1. INTRODUCTION

1. Berwick Bank Wind Farm Limited (BBWFL) is a wholly owned subsidiary of SSE Renewables (SSER) Limited and will hereafter be referred to as 'the Applicant'. The Applicant is developing the Berwick Bank Wind Farm (hereafter referred to as 'the Project'). This Marine Archaeology Technical Report presents baseline information for the offshore environment in the Firth of Forth offshore wind farm development Zone. The Marine Archaeology Technical Report covers the offshore elements of the Project located seaward of Mean Low Water Springs (MLWS) (henceforth referred to as the Proposed Development). The onshore transmission elements of the Project are being applied for separately. The onshore archaeology and cultural heritage assessment which includes the intertidal zone is provided in volume 1, chapter 10 of the Berwick Bank Wind Farm Onshore Environmental Impact Assessment (EIA) Report (SSER, 2022a).

2. The baseline described in the Marine Archaeology Technical Report underpins mitigation measures proposed within the Applicant's Written Scheme of Investigation (WSI), which includes a Protocol of Archaeological Discoveries (PAD). In November 2021, the Marine Archaeology Technical Report and Outline WSI were shared with Scottish Borders Council (SBC), Historic Environment Scotland (HES) and East Lothian Council Archaeology Service (ELC). HES and SCB confirmed that the mitigation was considered adequate[1] to avoid significant impacts (in EIA terms) on marine archaeology and it was appropriate for the Applicant to scope marine archaeology out of the EIA.

3. In June 2022, the Berwick Bank Wind Farm boundary was revised and the Proposed Development array area was reduced by approximately 20 percent. The assessments presented in the final Application are based on new Proposed Development boundaries and an updated Project Design Envelope. No significant changes have been made to the Proposed Development export cable corridor or landfall or the Proposed Development array area which falls entirely within the previous Proposed Development boundary.

4. The Marine Archaeology Technical Report and WSI have been updated to account for the location of anomalies and known archaeological assets relative to a revised marine archaeology study area that corresponds with the new Proposed Development boundaries. The updated WSI is available in the Berwick Bank Wind Farm Offshore EIA Report (at volume 4, appendix 22, annex D). The updated Marine Archaeology Technical Report (this report) is provided as an 'accompanying document' to the Application to ensure that the archaeological baseline that corresponds to the WSI is available to consultees.

5. The Applicant's responses to feedback received during consultation (see Table 1.1). The updated Marine Archaeology Technical Report does not report any updates to marine archaeology baseline for the revised marine archaeology study area that might warrant changes to the general methodology and procedures in the WSI and the fundamental conclusions are unchanged.

1.2. PURPOSE OF THIS REPORT

6. The aim of this Marine Archaeology Technical Report is to provide an overview of the offshore archaeological baseline associated with the Proposed Development. The objectives of this study are to:

   - summarise the potential for submerged prehistoric archaeology to be encountered within the marine archaeology study area (Figure 1.1).
   - identify known maritime and aviation sites, and based on the maritime history of the marine archaeology study area and the wider area, assess the potential for the existence of unknown sites and materials within the Proposed Development site;
   - present site-specific geophysical data from surveys across the Proposed Development array area and Proposed Development export cable corridor, identify anomalies of archaeological interest and characterise these anomalies integrating the results of the site-specific survey data with the findings of a desk-based review;
   - review available site-specific geophysical data for sediments of archaeological and palaeo-environmental interest and integrate the results with the findings of the desktop review; and
   - highlight updates to the baseline that might require additional mitigation measures or adaptations to the strategy.

7. The structure of the report is as follows:

   - Section 2: planning policy and legislation: sets out the relevant legislation, policy and guidance in relation to the known and potential marine archaeology within the marine archaeology study area;
   - Section 3: methodology: presents the marine archaeology study area (Figure 1.1), the scope of this study and the methodology and evidence used to define the baseline environment;
   - Section 4: baseline environment; characterises the known and potential submerged prehistoric and maritime archaeology within the marine archaeology study area:
     - Section 4.1: seabed and topography: describes the seabed and topography within the marine archaeology study area, as informed by site-specific surveys;
     - Section 4.2: submerged prehistoric archaeology: characterises the known and potential submerged prehistoric archaeology within the marine archaeology study area;
     - Section 4.3: maritime archaeology: characterises the baseline environment in relation to maritime archaeology by chronological period;
     - Section 4.4: Designated, Known and Recorded Wrecks: presents the results of a desktop review of designated, known and recorded wrecks within the marine archaeology study area; and
     - Section 4.5: archaeological assessment of seabed contacts identified during geophysical survey: presents the results of the geophysical assessments undertaken to identify anomalies of anthropogenic origin and therefore of archaeological potential.
   - Section 5: conclusions: presents the known and potential for submerged prehistoric and maritime archaeology within the marine archaeology study area.

[1] This was the position stated in a letter from HES to the Applicant dated 18 November 2021 and in an email from SBC to RPS Energy (the Applicant's consultants on 21 December 2021. ELC did not comment on marine archaeology in its response to scoping.

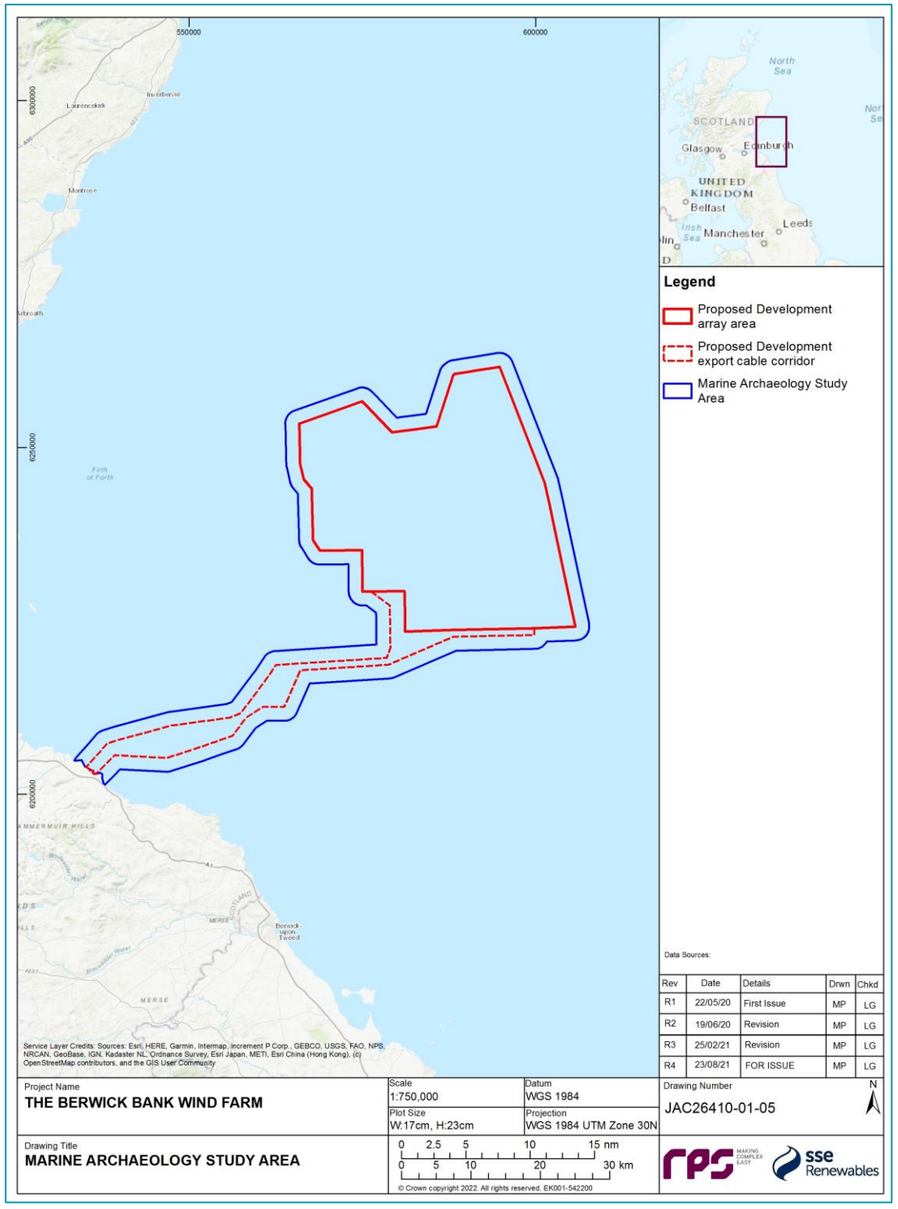

Figure 1.1: Marine Archaeology Study Area and Marine Archaeology Study Area (Revised July 2022

Table 1.1: Summary of Key Consultation and How This was Considered Within Marine Archaeological Technical Report, Written Scheme of Investigation and or Protocol for Archaeological Discoveries

Nature and Date of Contact	Name of Consultee(s)	Summary of Issue Raised	Response to Issue Raised and/or Where Considered
Letter to Applicant dated 18 November 2021	Name of Consultee(s) Historic Environment Scotland	The Responsibilities and Communications section of the PAD (Chapter 5) contains some details which may need to be reviewed. HES cannot agree to be the first point of contact/consultation for archaeological matters without confirmation from Marine Scotland (MS) as the regulatory authority. Otherwise, all contact should pass through MS. Figure 5.2 and section 5.3.5 may need to be redrafted.	The WSI has been updated (Figure 5.2 and paragraph 25) to reflect that communication will be through Marine Scotland as the regulator. This approach was discussed with MS-LOT during the bi-weekly meeting of 10 February 2022.
		It is understood that the proposed development is likely to include 307 wind turbines and 10 offshore substation platforms (OSPs)/Offshore convertor station platforms with foundations, a network of inter-array cabling, up to 12 offshore export cables and 2 km^2 of scour protection.	The updated PDE for the revised Proposed Development boundary does not alter this understanding significantly. The PDE for offshore export cables has reduced; the Applicant proposes up to eight cables (rather than 12). The other design parameters listed have not changed.
		At Section 5.2, paragraph 35 of the PAD, the contact should be changed to 'HES Planning, Consents and Advice Service' to ensure adequate resilience.	Contact has been updated as requested in section 5.2 of the WSI and PAD.
		Paragraph 157 of the Marine Archaeological Technical Report missing reference source	Marine Archaeology Technical Report updated to remove of 'Error' messages related to cross referencing in three instances across the Technical Report
Email to Applicant dated 21 December 2021	Scottish Borders Council	We have reviewed the Marine Archaeological Technical Report, the Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) submitted for this scheme. We are content with these documents.	Noted. As the approach taken to define the study area and baseline information in the Marine Archaeology Technical Report and the designed in measures and method statements and procedures in the WSI unchanged, the Applicant considers this finding remains relevant.
Email to Applicant dated 21 December 2021	Scottish Borders Council	The Technical Report is a useful summary of archaeological work to date and the other documents indicate how impacts will be avoided. All the documents work in combination. SBC content there is no risk of significant impacts upon the archaeological remains and on this basis, marine archaeology can be scoped-out.	The Marine Archaeology Technical Report and the WSI continue to work in combination (as both have been updated in response to the Proposed Development boundary changes). As above, the conclusions formed after review of the documents are considered likely to remain relevant.
Email to Marine Scotland from East Lothian Council. In response to scoping 2021. Undated. Email to Marine Scotland from East Lothian Council.	East Lothian Council.	Applicant to note the opportunities for comment with HES and ELC also.	The Applicant has been informed by the responses received from Fife Council, then SBC and HES. The ELC did not comment on maritime archaeology or the documents submitted for review.
	East Lothian Council.	Guidance about national policy can be found in Historic Environment Scotland's 'Managing Change in the Historic Environment' series available online technical advice is available on their Technical Conservation website.	Noted.
Formal scoping comments of email 29 October 2021	Fife Council	There should be a clear reference within the offshore EIAR as to where the information on the onshore works can be found.	The onshore assessment is in volume 1, chapter 10 of the Berwick Bank Wind Farm Onshore Environmental Impact Assessment (EIA) Report (SSER, 2022a).
	Fife Council	Fife Council's Archaeology team suggest that the Applicant adopts multibeam scanning of potential seabed cultural heritage anomalies as part of their archaeological mitigation strategy.	Agree and this and reference to this is included in the WSI (see section 6.3) where specifications for geophysical survey techniques are set out in the WSI.
Formal scoping comments of Scottish Borders Council – email 8 December 2021	Scottish Borders Council	Fife Council's Archaeology team suggest that any survey results of sites identified as containing cultural material should be made available to the archaeological record.	Agree and archaeological reports will be made available to Fife Council on completion of Project as outlined in section14.1.2 of the WSI and PAD
	Scottish Borders Council	Scottish Borders Council recommend that the Marine Archaeology Technical Report is archived with the Scottish Borders Historic Environment Record (HER) and the other HERs that cover the coastline adjacent to this proposed development	Agree once the Marine Archaeology Technical Report is finalised and in the public domain a copy can be archived in the relevant HERs
Formal scoping comments of Scottish Borders Council – email 8 December 2021		The area covered by the proposal is 1,314 km^2	The PDE for the area covered by the proposed has reduced to 1,010.2 km^2
		Content with the proposed search area for these maritime archaeology aspects (the Proposed Development site plus 2 km buffer)	The method used to define the updated search area has not changed
		Scottish Borders Council agree that the variety of the maritime archaeological resource and range of possible impacts are accounted for. The MATA detailed the physical, potential and recorded sites and anomalies within the area. The archaeological exclusion zones are welcomed.	The updated Project Design Envelope for the revised Proposed Development boundary has no bearing on the variety of assets or possible impacts considered. Archaeological exclusion zones are still proposed as mitigation.
		Scottish Borders Council recommend that any reports of any fresh findings also be archived with the Scottish Borders HER and the other HERs that cover the coastline adjacent to the Proposed Development.	Agree and this is set out in this WSI and PAD (see section 14), which addresses 'reporting')).
Marine Scotland Licensing Operations Team (MS-LOT): Scoping Opinion for Berwick Bank Wind Farm - 4 February 2022	MS-LOT	The Scoping Report's measures to be adopted as part of the Proposed Development, such as the provision of a Protocol for Archaeological Discoveries, are outline. On the work carried out thus far, SBC is content with the protocol for the further recovery and recording of any archaeological information and that appears to be missing in the PAD	The WSI (which includes the PAD) is available in the Berwick Bank Wind Farm Offshore EIA Report (at volume 4, appendix 22).
	MS-LOT	The recommendations contained in the Fife Council representation regarding multibeam scanning and making survey results available for archaeological record should be implemented for the identified potential impacts to be scoped out.	The geophysical survey techniques are set out in the WSI.
		The Scottish Ministers are content with regard to the study area and baseline information. This is a view supported by the representations from Fife Council, HES and the Scottish Borders Council December representation.	Noted.

2. PLANNING AND LEGISLATION

2.1. LEGISLATIVE CONTEXT

8. This section outlines the legislation, policy, guidance and development plans relevant to offshore archaeological remains in the context of offshore renewable energy development.

2.1.2. MARINE (SCOTLAND) ACT 2010

9. Marine historic assets of national importance within Scottish Territorial Waters (STW) are protected primarily by the Marine (Scotland) Act 2010 (content available on the UK Government Website accessed August 2022 - legislation.gov.uk), in particular Part 5 Section 73. This states that an area may be designated as an Historic Marine Protected Area (MPA) if Scottish Ministers consider it desirable to preserve a marine historic asset which is located in the area.

10. A marine historic asset is defined as a vessel, vehicle or aircraft (or part of), the remains of a vessel, vehicle or aircraft (or part of), an object contained in or formerly contained in a vessel, vehicle or aircraft, a building or other structure (or part of), a cave or excavation, and a deposit or artefact or any other thing which evidences previous human activity.

11. The purpose of Historic MPAs is to preserve by law, marine historic assets of national importance. There is no requirement for specific permission to carry out work inside a Historic MPA, however permission under the Town and Country (Scotland) Planning Act (1997) or a Marine Licence (ML) under the Marine and Coastal Access Act (MCCA) 2009 (in waters 12 nm to 200 nm), or under the Marine (Scotland) Act 2010 (from Mean High Water Springs (MHWS) to 12 nm) may be required (content available on the United Kingdom (UK) Government Website accessed August 2022 legislation.gov.uk).

12. Clear preservation objectives are provided for each Historic MPA and their boundaries define an exclusion zone to activities that could lead to disturbance of the marine historic asset.

13. In Scotland, the Marine Scotland Act 2010 has replaced Section 1 of the Protection of Wrecks Act 1973.

2.1.3. PROTECTION OF WRECKS ACT 1973

14. Section 2 of the Protection of Wrecks Act 1973 (content available on the UK Government Website accessed August 2021 legislation.gov.uk) provides guidance on the protection of wrecks that are designated as dangerous due to their contents. Protections are administered by the Maritime and Coastguard Agency (MCA) through the Receiver of Wreck (RoW).

2.1.4. PROTECTION OF MILITARY REMAINS ACT 1986

15. The Protection of Military Remains Act 1986[2] makes it an offence to interfere with the wreckage of any crashed, sunken or stranded military aircraft or designated vessel, without a licence. This is irrespective of whether there was loss of life associated with the wreck, or whether the loss of the aircraft or vessel occurred during peacetime or wartime.

16. All crashed military aircraft receive automatic protection under this Act, but vessels must be individually designated. There are two levels of protection offered by this Act:

- designation as a Protected Place: Protected Places include the remains of any aircraft which crashed while in military service or any vessel designated (by name, not location) which sank or stranded in military service after 04 August 1914. Although crashed military aircraft receive automatic status as a Protected Place, vessels need to be specifically designated by name. The location of a vessel does not need to be known for it to be designated as a Protected Place; and
- designation as a Controlled Site: Controlled Sites are designated areas which encompass the remains of military aircraft or a vessel sunk or stranded in military service within the last 200 years. Diving operations are effectively prohibited in these sites without a specific licence granted by the Secretary of State in accordance with the provisions of the Act.

2.1.5. ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979

17. This primarily land-based Act also provides protection for underwater sites within the UK territorial waters. Buildings, structures or works, caves or excavations, vehicles, vessels, aircraft or other movable structures of national importance may be scheduled as ‘monuments’. It is an offence to demolish, destroy, remove, alter or repair or make any alterations to a monument or carry out any flooding or tipping operations, without scheduled monument consent (content available on the UK Government Website accessed August 2022 - legislation.gov.uk). The Act is administered in Scotland by HES on behalf of Scottish Ministers.

2.1.6. MERCHANT SHIPPING ACT 1995

18. All wrecks within UK territorial waters and any wreck which landed in the UK from outside the UK territorial waters must, as stated in Section 236 of the Merchant Shipping Act 1995, be declared to the RoW, who acts on behalf of the MCA in administering this section of the Act. The Act defines ‘wreck’ as anything which is found in or on the sea or washed ashore from tidal waters (content available on the UK Government Website accessed August 2022 legislation.gov.uk).

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

2.1.7. INTERNATIONAL LAW

20. Outside the UK territorial waters (i.e. beyond 12 nm), the regulation and reporting of maritime archaeology is governed by international legislation and guidance, such as the United Nations Convention on the Law of the Sea 1982 (UNCLOS, 1982), the European Convention on the Protection of the Archaeological Heritage (Revised) 1992 (the Valletta Convention) and the United Nations Educational, Scientific and Cultural Organisation’s Convention on the Protection of Underwater Cultural Heritage 2001 (UNESCO, 2001).

[2] Content available on the UK Government Website [https://www.legislation.gov.uk/ukpga/1986/35/contents] accessed August 2022

2.2. PLANNING FRAMEWORK

2.2.1. MARINE POLICY STATEMENT 2011

21. The UK Marine Policy Statement (MPS) sets out high level marine objectives for ensuring that marine resources are used in a sustainable way. It was published by the UK Government in 2011.

22. Section 2.6.6 of the MPS sets out the aspects of the historic environment that merit consideration in marine planning and advises that heritage assets should be conserved through marine planning in a manner appropriate and proportionate to the significance of the asset. When considering the significance of a heritage asset and its setting, the marine planning authority should take into account the particular nature of the interest held in the asset and the value it might hold for this and future generations.

23. Designated heritage assets in coastal/intertidal zones and inshore/offshore waters may include Scheduled Monuments, Protected Wreck Sites and sites designated under the protection of the Military Remains Act 1986. Non-designated heritage assets of equivalent status should be considered under the same policy principles as designated heritage assets.

24. Where the loss of the whole or material part of a heritage asset's significance is justified, suitable mitigation measures should be put in place. Mitigation requirements should be based on advice from relevant regulators and advisors.

2.2.2. SCOTLAND'S NATIONAL MARINE PLAN 2015

25. The Scottish National Marine Plan (NMP) was published in 2015 and reviewed in 2018 and 2021 and sets out high-level objectives for managing offshore development and advise for the preparation of future Regional Marine Plans.

26. General Policy 6 within the National Marine Plan relates to the historic environment and states that '*Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance*'.

27. The NMP advises that designated heritage assets should be protected *in situ* within an appropriate setting, and that substantial loss of harm to designated assets should be exceptional and should only be permitted '*if this is necessary to deliver social, economic or environmental benefits that outweigh the harm or loss*'.

28. The NMP further identifies that non-designated heritage assets that meet designation criteria or make a positive contribution should also be protected *in situ*, wherever possible, and consideration given '*to the potential for new discoveries of historic or archaeological interest to arise*'.

29. The NMP outlines that proposals for development that may '*affect the historic environment should provide information on the significance of known heritage assets and the potential for new discoveries to arise. They should demonstrate how any adverse impacts will be avoided, or if not possible, minimised and mitigated. Where it is not possible to minimise or mitigate impacts, the benefits of proceeding with the proposal should be clearly set out*'.

30. The NMP also states that '*where the case for substantial change to heritage asset is accepted, marine decision-making authorities should require applicants to undertake suitable mitigating actions to record and advance understanding of the significance of the heritage asset before it is lost, in a manner proportionate to that significance*'.

2.2.3. REGIONAL MARINE PLAN

31. The Proposed Development lies within the Forth and Tay region as defined by the Scottish Marine Regions Order 2015 (legislation.gov.uk). The regional marine plan for the Forth and Tay region is still at the very early stages of development.

2.2.4. MARINE ARCHAEOLOGICAL GUIDANCE

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

- Code of Conduct (Chartered Institute for Archaeologists, 2014);
- Standard and Guidance for Historic Environment Desk Based Assessment (Chartered Institute for Archaeologists, 2014);
- The Code of Practice for Seabed Developers (The Joint Nautical Archaeology Policy Committee, 2008);
- Historic Environment Guidance for the Offshore Renewable Energy Sector (COWRIE, 2007);
- Offshore Renewables protocol for Archaeological Discoveries (The Crown Estate, 2014);
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2010); and
- Making the Most of Scotland's Seas (The Scottish Government, 2010).

3. METHODOLOGY FOR DEFINING THE BASELINE ENVIRONMENT

3.1. SCOPE

33. The scope of this study is to:

- assess the results of the 2019 and 2020 geophysical survey datasets provided by Fugro Consultants (2019, 2020a 2020b) (Fugro) to identify any sites and materials of possible archaeological significance within the marine archaeology study area; and
- compare the geophysical interpretation with the desktop review, historical data, known archaeological sites and previous investigations in the vicinity of the marine archaeology study area to outline the known and potential marine archaeological resource.

34. Marine archaeology as assessed in this report is characterised as:

- submerged prehistoric archaeology (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g., hand axes); and
- maritime archaeology (such as shipwrecks and associated material including cargoobstructions and fishermen's' fasteners) and aviation sites (aircraft crash sites and associated debris).

3.2. MARINE ARCHAEOLOGY STUDY AREA

35. The marine archaeology study area encompasses the Proposed Development array area and Proposed Development export cable corridor up to MLWS at the selected landfall (Skateraw Landfall). The Proposed Development array area together with the Proposed Development export cable corridor comprise the Proposed Development site. Geophysical survey was undertaken over the Geophysical Survey Area (GSA) indicated in Figure 3.1 which covers the Proposed Development array area and a representative portion of the Proposed Development export cable corridor. Where the GSA extends beyond the Proposed Development export cable corridor an assumption can be made for a similar corresponding result within the Proposed Development export cable corridor itself. The marine archaeology study area is defined as the Proposed Development site plus an additional 2 km buffer area around the extent of the Proposed Development site. This was used as the search area within which records from relevant archive databases were obtained. This wider marine archaeology study 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 archaeological sites identified to be represented in a broader archaeological context.

36. The marine archaeology study area overlaid onto Admiralty Chart is shown in Figure 3.2.

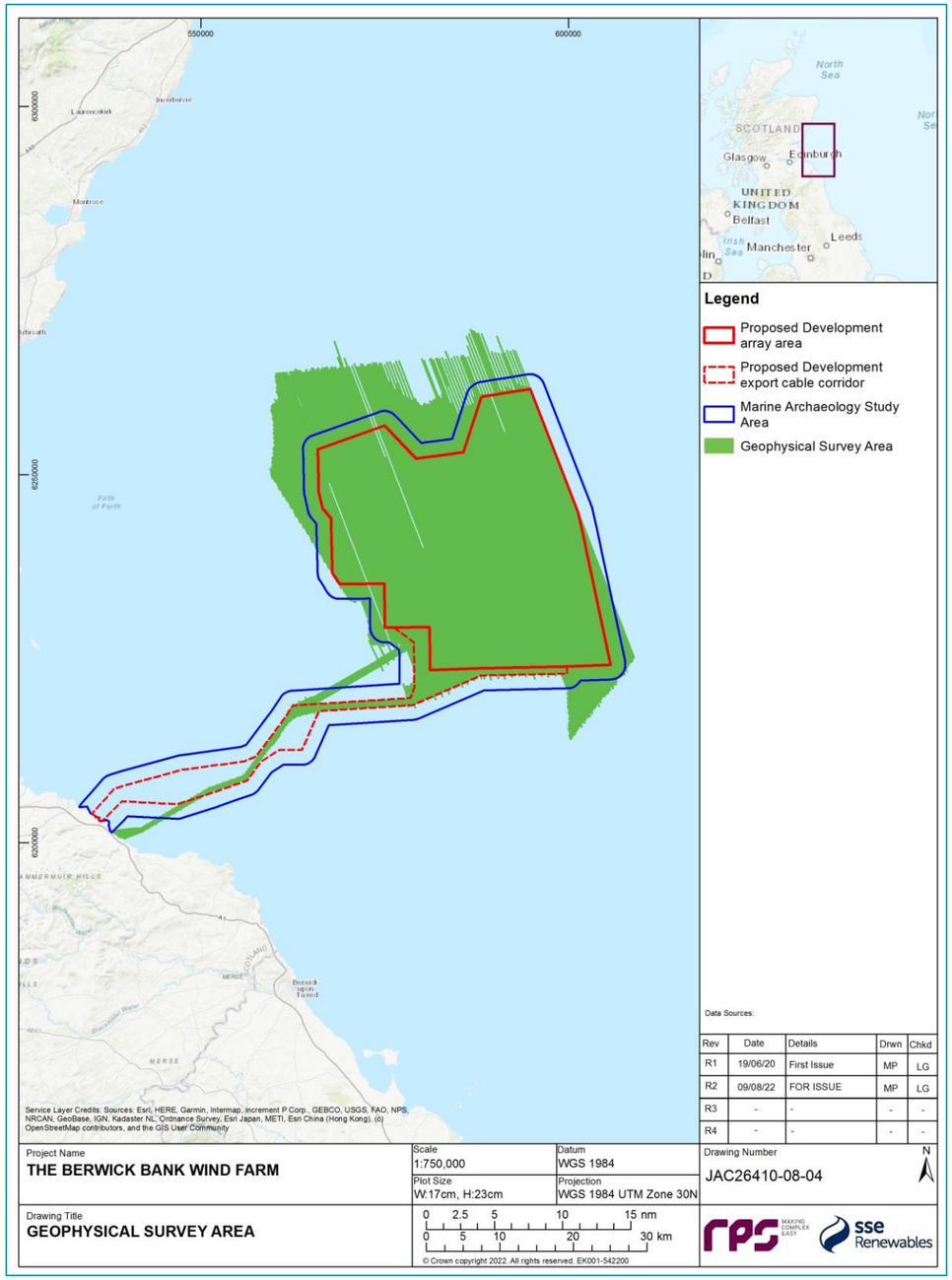

Figure 3.1: Geophysical Survey Area Relative to the Marine Archaeology Study Area

3.2.2. DESKTOP REVIEW

37. Information on marine archaeology within the marine archaeology study area was collected through a detailed desktop review of existing studies and datasets from the following principal primary sources:

- records of UK Hydrographic Office (UKHO) wrecks and obstructions;
- records of MPAs held by HES in their online Historic Environment Portal;
- catalogue of heritage sites recorded on the National Record of the Historic Environment held by HES and accessed via their website called Canmore;
- records held in East Lothian Historic Environment Record; and
- records held in Scottish Borders Historic Environment Record.

38. The baseline data were plotted to identify the general distribution of known and recorded shipping casualties within the marine archaeology study area. Information drawn from secondary sources was used qualitatively, particularly to develop an understanding of the likelihood of unknown and unrecorded maritime archaeological sites.

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

3.2.3. SITE-SPECIFIC SURVEYS

40. The potential for submerged prehistoric archaeology is assessed with reference to seabed geology and topography, which has been informed by a combination of sources, including peer-reviewed literature but principally, geophysical survey data. A geophysical survey was undertaken across the GSA. Magnetometer, Sidescan Sonar (SSS), Sub-Bottom profiler (SBP) and Multibeam Bathymetry (Multibeam Echosounder; MBES) survey data were collected by Fugro between August and October 2019 (Fugro 2019, Fugro 2020a and 2020b). The primary purpose of these data was to inform the potential for submerged prehistoric archaeology and anomalies of potential anthropogenic origin requiring consideration to be present within the marine archaeology study area and provide baseline information to inform the EIA of the Proposed Development (Figure 3.2).

41. The data collected varied in specification however, it is considered comparable and appropriate to allow for the characterisation of the marine archaeological potential of the Proposed Development site. The full scope and methods for these investigations are described in the method statements produced in advance of each geophysical and geotechnical survey.

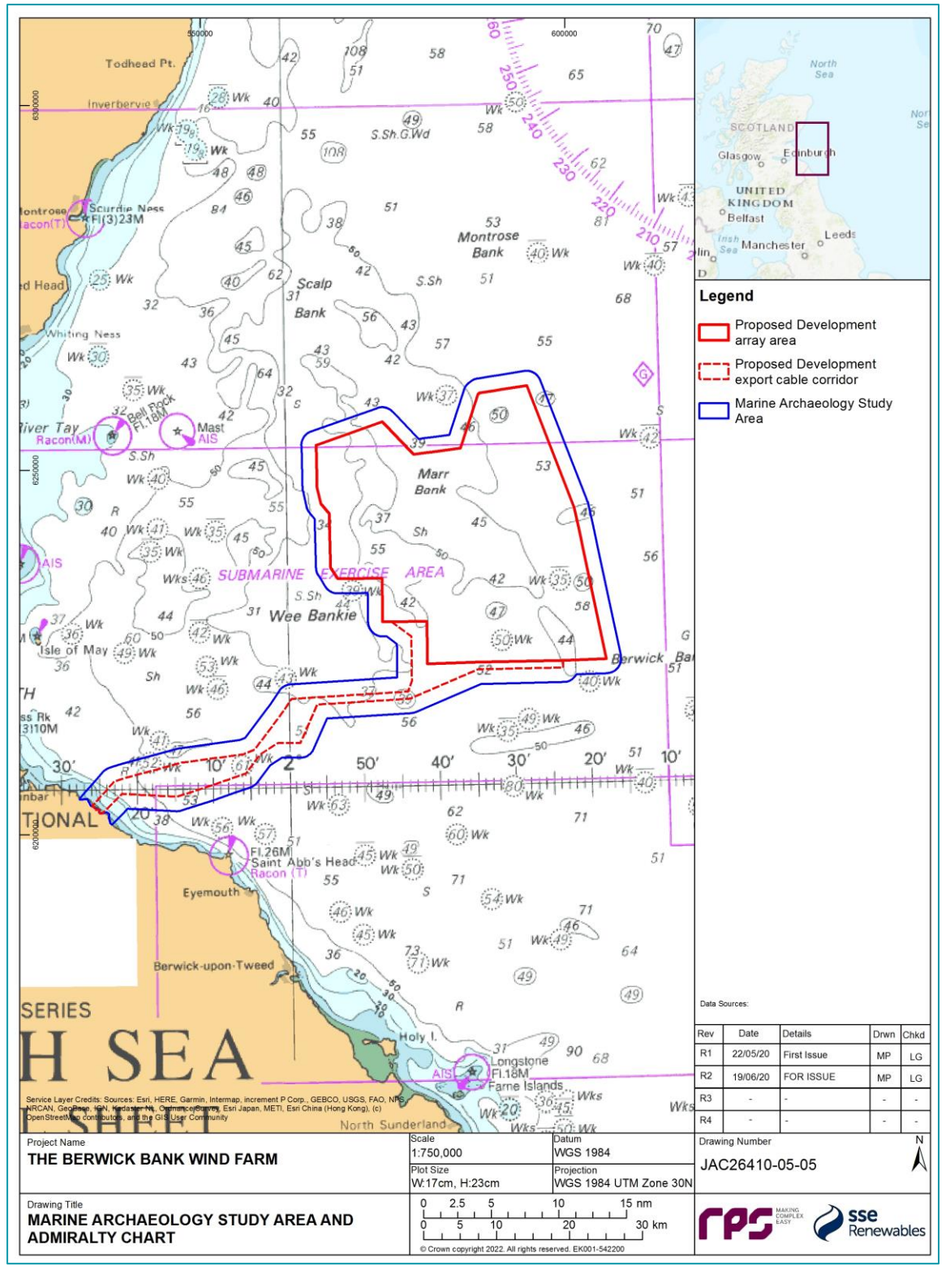

Figure 3.2: Marine Archaeology Study Area Overlaid onto Admiralty Chart

42. Line spacing within the Proposed Development array area and the areas surveyed within Proposed Development export cable corridor varied. Within the Proposed Development array area the specification was set at 200 m for mainlines (running north north-west/south south-east) with crosslines (running WSW/ENE) at 1000 m; whilst within the Proposed Development export cable corridor mainlines were specified at 75 m with crosslines at 1000 m.

43. The data was collected to a specification appropriate to achieve the following interpretation requirements:

- magnetometer: identification of contacts > 5 nano Tesla (nT);
- SSS: ensonfication of contacts > 0.3 m;
- SBP: penetration > 10 m; and
- MBES: ensonification of contacts < 1.0 m.

44. Following data delivery, an initial review of the dataset was undertaken to gain an understanding of the geological and topographic make-up of the survey area. Within the survey area, the potential for variations in the seabed are high and can affect the interpretation of contacts. However, the towed sensors, SSS and magnetometer, used an Ultra Short Baseline (USBL) positioning system to ensure positional accuracy of the sensors throughout the survey. Positional accuracy is further increased through the correlation of SSS and Magnetometer datasets with the MBES dataset.

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

46. Magnetometer data indicate the presence of ferrous and thus usually anthropogenic material both on, and under the seabed, and where line spacing allows. The survey line spacing for the site-specific geophysical survey ranges between 75 m and 200 m which is too great for the accurate positioning of magnetic anomalies but can indicate areas of archaeological potential. A magnetic anomaly position can only be determined from directly below the sensor, or where lines are run close together to position an anomaly seen on two, or more lines. Where possible, significant magnetic anomalies were correlated with contacts visible on the seabed.

47. Whilst SBP and MBES are useful tools for archaeological assessment, their primary use, outside of seabed and palaeo-landscape characterisation, is in the corroboration of contacts identified in the SSS and magnetometer data. As such, all contacts of potential anthropogenic origin were assessed for archaeological potential, primarily alongside the magnetometer data, with SBP and MBES data used to corroborate identified contacts.

48. Archaeological potential was assigned to each contact based on the criteria outlined in Table 3.1 below. Where uncertainty existed as to the identification or archaeological potential of a contact the provided dataset was imported into point cloud visualisation software such as Cloud Compare to view the un-gridded data.

Table 3.1: Criteria for Assigning Archaeological Potential

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

49. Contacts assessed as having low, medium and high archaeological potential were then compiled into a gazetteer and a shapefile created for further assessment alongside known features such as wrecks, mooring buoys, third party assets such as cables and pipelines, and other seabed structures. The data was subsequently assessed against known anomalies of no archaeological interest to remove contacts of no archaeological importance.

50. As well as identifying surface contacts of potential archaeological interest the geophysical and hydrographic survey data was reviewed to assess the potential survival of palaeo-landscapes within the marine archaeology study area.

51. Sub-surface data acquired from SBP and seismic surveys is key to understanding the palaeo-landscape potential of the marine archaeology study area. Sedimentary horizon grids and geological maps derived from the interpretation of sub-surface data and the current seabed derived from MBES data were assessed. Sedimentary deposits were correlated with geological formations, and the depositional context and make-up of the deposits presented. The results inform the characterisation of the palaeo-environmental and archaeological potential included in this report.

3.2.4. DATA LIMITATIONS

52. The interpretation of geophysical and hydrographic data is by its very nature, subjective. However, by using an experienced specialist who can analyse the form, size and characteristics of an anomaly, a reasonable degree of certainty can be achieved. Measurements can be taken in most data processing software, and whilst largely accurate, discrepancies can occur. Where there is uncertainty as to the potential of an anomaly or its origin, a precautionary approach is always taken to ensure the most appropriate mitigation for the historic environment is recommended. There may be instances where a contact may exist on the seabed but not be visible in the geophysical data. This may be due to the anomaly being covered by sediment or being obscured from the line of sight of the sonar, or due to poor quality data. The use of both SSS and MBES data mitigates this by visualising anomalies from many angles.

4. BASELINE ENVIRONMENT

4.1. SEABED GEOLOGY AND TOPOGRAPHY

53. The geological processes that form a sequence of seabed deposits provide information to inform an understanding of an area's submerged prehistoric archaeological potential. This section therefore describes the seabed geological sequence and seabed topography within the marine archaeology study area, as a foundation for the sections which follow. It has been informed by a characterisation of the results of the site-specific geophysical surveys, as described in section 3, and by relevant documentary sources.

54. The marine archaeology study area lies within the Outer Forth Estuary of the North Sea Basin. Thick sequences of Quaternary deposits have been recorded in this area comprising Holocene Sediments, deposits of the Forth Formation, the Wee Bankie/Marr Bank Formations and the Aberdeen Ground Formation. The Proposed Development array area and Proposed Development export cable corridor are addressed in this section as separate components of the marine archaeology study area (Figure 4.1).

4.1.2. PROPOSED DEVELOPMENT ARRAY AREA

55. Within the Proposed Development array area, Pre-Quaternary bedrock is characterised by Triassic fine grained deposits of the Smith Bank Formation and outcrops of Permian bedrock. The bedrock is overlain by later Quaternary deposits although it is locally exposed. The bedrock has been incised with a series of features interpreted as channels or tunnel valleys infilled by early to middle Quaternary deposits (Fugro, 2020a and 2020b).

56. The Aberdeen Ground Formation (recorded as Unit E (Fugro, 2019 and 2020a and 2020b; Figure 4.1) forms the earliest Quaternary deposit within the Proposed Development array area, it is particularly thick within the western parts of the Proposed Development array area (up to 50 m – 100 m). It forms an infill sediment in the channels or tunnel valleys recorded in the bedrock. Investigations in the region have found the Aberdeen Ground Formation to comprise grey clay with occasional shell and plant remains. Partly lignitised wood remains have also been found within this deposit (Holmes, 1977). The Formation was laid down over a long period during the early to middle Pleistocene and deposited in cold environments in fluvial, glacial or marine environments (BGS, 1994; Fugro, 2019).

57. The Marr Bank Formation (recorded as Unit D (Fugro, 2019 and 2020a and 2020b; Figure 4.1) was identified across the Proposed Development array area, although it is locally absent towards the west. It comprises silty, gravelly sand deposited in a pro-glacial fluvial to deltaic environment potentially representing an outwash plain during the late Devensian. Evidence of palaeo-channel systems are present within the Marr Bank Formation and it also forms infill to channels incised into the Aberdeen Ground Formation. In the west of Unit D, evidence of a moraine has been recorded which resulted from material left behind by ice flowing west/east during the Last Glacial Maximum. Should the deposits represent outwash plain then the moraine could mark the limit of the Devensian glaciation.

58. The Wee Bankie Formation (recorded as Unit C (Fugro, 2019 and 2020a and 2020b; Figure 4.1) is more dominant in the west of the Proposed Development array area though it is present in discontinuous form in the east of the Proposed Development array area. It is a late Devensian deposit comprising gravelly and sandy clay interpreted as terminal moraine or subglacial till. It infills channels incised into the Marr Bank Formation or the Aberdeen Ground Formation. The deposit may be formed of multiple phases of till units which may represent different stages of the Devensian glaciation. Where the Marr Bank Formation meets the Wee Bankie Formation has been interpreted as potentially the interface between the Last Glacial Maximum (to the west) and the sea (to the east).

59. The Forth Formation/St Abbs Formation (recorded as Unit B (Fugro, 2019 and 2020a and 2020b; Figure 4.1) is identified across the west of the Proposed Development array area. The deposit was laid down in glacio-lacustrine to glacio-marine conditions during the late Devensian early Holocene.

60. Seabed sediments (recorded as Unit A (Fugro, 2019 and 2020a and 2020b; Figure 4.1) laid down under marine conditions during the Holocene overlay the Forth Formation across the Proposed Development array area.

61. The maximum recorded seabed depth is in the centre of the Proposed Development array area where deep channels cut into the seabed (-68.5 m Lowest Astronomical Tide (LAT)). The shallowest area was recorded in the west of the Proposed Development array area (-32.4 m LAT). The seabed depth across the majority of the Proposed Development array area is recorded between -40 m to -60 m LAT. The seabed is generally recorded as undulating, representing historical erosion with a gentle slope downwards towards the east and south-east. A number of channels have been recorded across the area of various depths and widths of a few metres to several kilometres (Fugro 2019).

62. The site-specific geophysical survey recorded mega ripples and sand waves specifically on the western flanks of the large-scale banks. Sand bars (shelly, gravelly sand-filled trenches representing relic glacial-fluvio marine-reworked sediments) were recorded mainly on the western slopes of the highest topographic areas, whilst furrows and erosion was mainly recorded on the eastern slopes. Extensive boulder fields and isolated boulders were recorded across the Proposed Development array area, and swathes of trawl marks were also recorded. Consequently, it is apparent that post-glacial seabed erosion has taken place to some extent across the Proposed Development array area.

63. The site-specific bathymetry records a varied seabed morphology with two large-scale banks (the Marr Bank and the northern part of the Berwick Bank array area), two main ridges (possibly representing ice-marginal features in southern part of the Proposed Development array area) and incised valleys/relict glacial lake and channels, as discussed above (Fugro, 2019). Features such as infilled channels, ridges and kettle holes/glacial lakes could represent relict periglacial conditions (ice edge environments) during periods when the seabed was potentially exposed, and it is these areas that could have been exploited by early hominins.

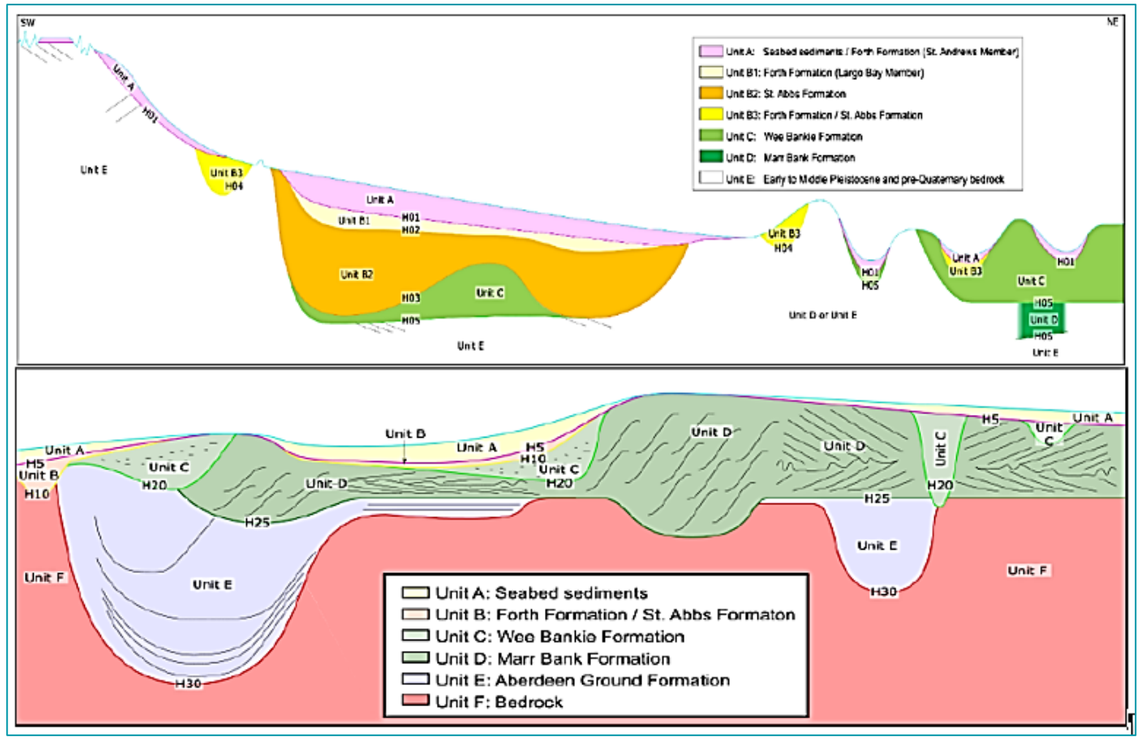

Figure 4.1: Schematic Geomodel of Quaternary Stratigraphy of the Proposed Development Export Cable Corridor (Top) and Proposed Development Array area (Bottom)

4.1.3. PROPOSED DEVELOPMENT EXPORT CABLE CORRIDOR

64. The pre-Quaternary bedrock across the Proposed Development export cable corridor is characterised by Triassic siliciclastic and argillaceous rock, and sandstone and Permian mudstone and gypsum stone in the eastern part of the route, Dinantian siliciclastic and argillaceous rock and sandstone in the central and inshore part of the route. Generally, the bedrock is overlain by later Quaternary deposits although it is locally exposed. The bedrock has been incised with a series of features interpreted as channels or tunnel valleys infilled by early to middle Quaternary deposits (Fugro, 2020).

65. The Aberdeen Ground Formation (recorded as Unit E (Fugro, 2019 and 2020a and 2020b; Figure 4.1) forms the earliest Quaternary deposit within the Proposed Development export cable corridor, although it was only identified locally in the east of the route. Across the remainder of the route, it is indistinguishable from the pre-Quaternary bedrock.

66. The Marr Bank Formation (recorded as Unit D (Fugro, 2019 and 2020a and 2020b; Figure 4.1) was only identified in the eastern part of the Proposed Development export cable corridor.

67. The Wee Bankie Formation (recorded as Unit C (Fugro, 2019 and 2020a and 2020b; Figure 4.1) is recorded centrally and to the east of the Proposed Development export cable corridor and is discontinuous in the west. It infills palaeo-channels, which are up to 90 m thick. These channels cut into the underlying Marr Bank Formation or Aberdeen Ground Formation and may represent tunnel valleys.

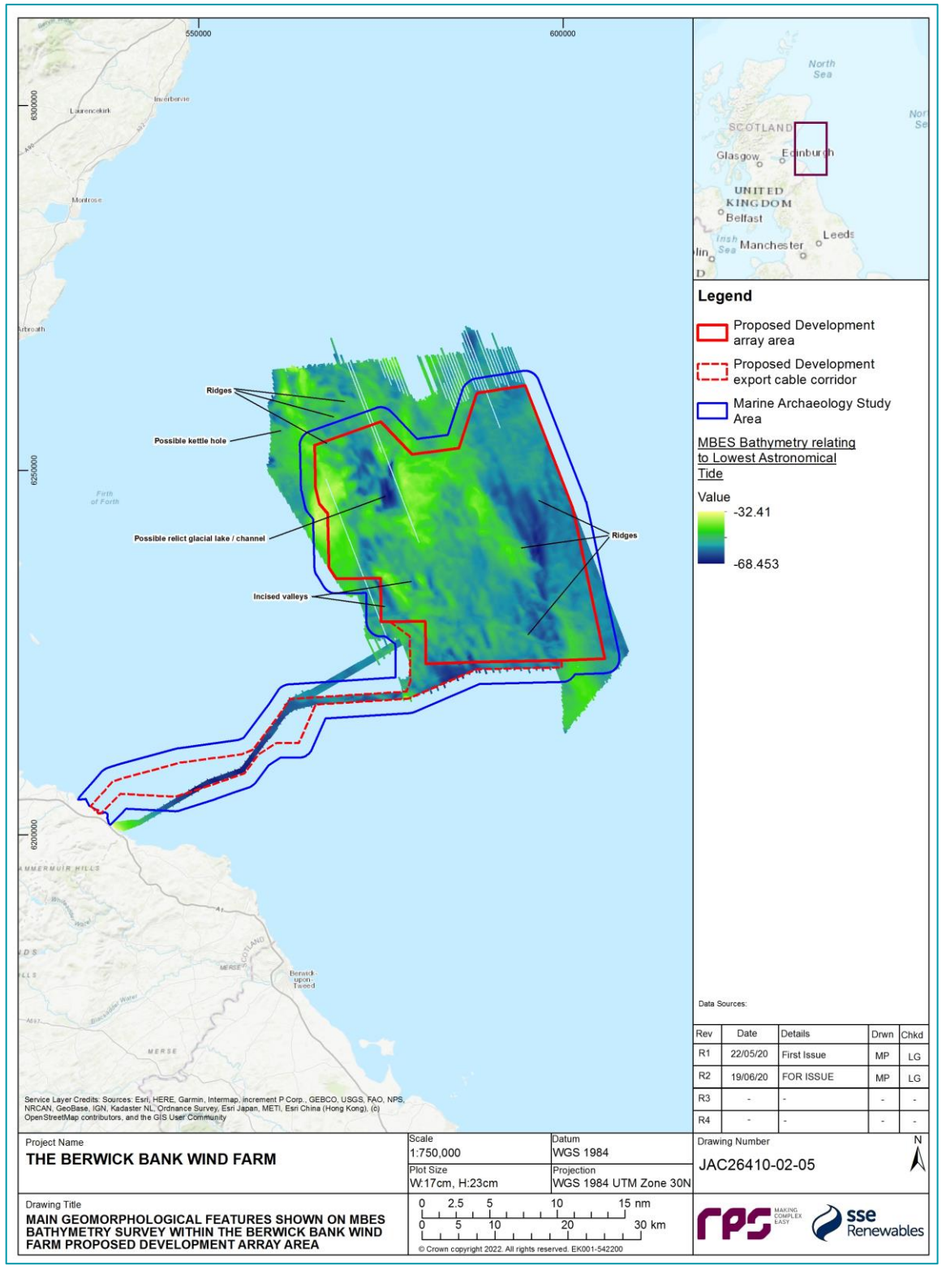

Figure 4.2: Main Geomorphological Features Shown on MBES Bathymetry Survey within Proposed Development Array Area

68. The Forth Formation/St Abbs Formation (recorded as Unit B3 (Fugro, 2019 and 2020a and 2020b; Figure 4.1) is present primarily in the east of the Proposed Development export cable corridor and south of the Proposed Development array area. The deposit was laid down in glacio-lacustrine to glacio-marine conditions during the late Devensian/early Holocene and comprises sands, silts or clays. It infills channels incised into the underlying Wee Bankie Formation and also forms part of the infill of palaeo-valleys incised into the Aberdeen Ground Formation. These palaeo-valleys form a complex up to 30 km in width (Fugro, 2019).

69. The St Abbs Formation (recorded as Unit B2 (Fugro, 2019 and 2020a and 2020b; Figure 4.1) is present within the central and western survey areas. It is thought to consist of clays and occasional gravels deposited in glacio-lacustrine to glacio-marine conditions laid down during the Late Devensian. Geotechnical boreholes in the Proposed Development export cable corridor might indicate the presence of organic material/peat within this Unit (Fugro, 2019).

70. The Largo Bay Member of the Forth Formation (recorded as Unit B1 (Fugro, 2019 and 2020; Figure 4.1) is present in the central and western part of the survey area. It is characterised by clays, silts and occasional gravels deposited in glacio-marine conditions in the Late Devensian.

71. A mix of seabed sediments and St Andrews Bay Member of the Forth Formation (recorded as Unit A (Fugro, 2019 and 2020; Figure 4.1) is recorded across the bulk of the surveyed area of unit. The St Andrews Bay Member consists of clayey and gravelly sand and was deposited in the early Holocene. It represents shallow marine or estuarine environments and overlays the Largo Bay Member. It infills a number of large valleys and depressions in the Forth Formation. Later Holocene seabed sediments laid down under marine conditions are also recorded.

72. Across the Proposed Development export cable corridor, the seabed slopes gently towards the east reaching seabed depth of 60 m LAT in the centre of the corridor before decreasing to between 30 m – 40 m depth over the southern part of the Marr Bank and then increasing again to depths of about 64 m deep at the eastern extent (Fugro, 2019) (Figure 4.2).

73. Ripples, mega ripples, sand bars and ribbons characterise the seabed morphology across the Proposed Development export cable corridor. Extensive trawl marks dominate the centre of the Proposed Development export cable corridor but stop before the ridges outcrop, whilst the eastern extent of the corridor's morphology is very similar to that discussed above for the Proposed Development array area. Consequently, post-glacial seabed erosion is considered likely to have taken place to some extent across the Proposed Development export cable corridor.

74. The bathymetry again (Figure 4.2) records a varied and uneven seabed morphology framed by the pre-Holocene landscape of outcrops, ridges, high topographic mounds, incised valleys and channels. The western extent consists of a rocky outcrop covered by a thin layer of sediment. The central part of the Proposed Development export cable corridor is dominated by an elongated ridge rising for about 6 m from the seabed and interpreted as pre-Quaternary bedrock. A rocky outcrop/platform has been identified within the nearshore area that extends up to 6 km offshore (Fugro, 2020). This platform may tie in with the Main Late glacial shoreline recorded elsewhere along the east coast of Scotland (Stoker, 2008). The eastern extent includes some high topographic features, incised valleys and channels similar to those recorded in the Proposed Development array area.

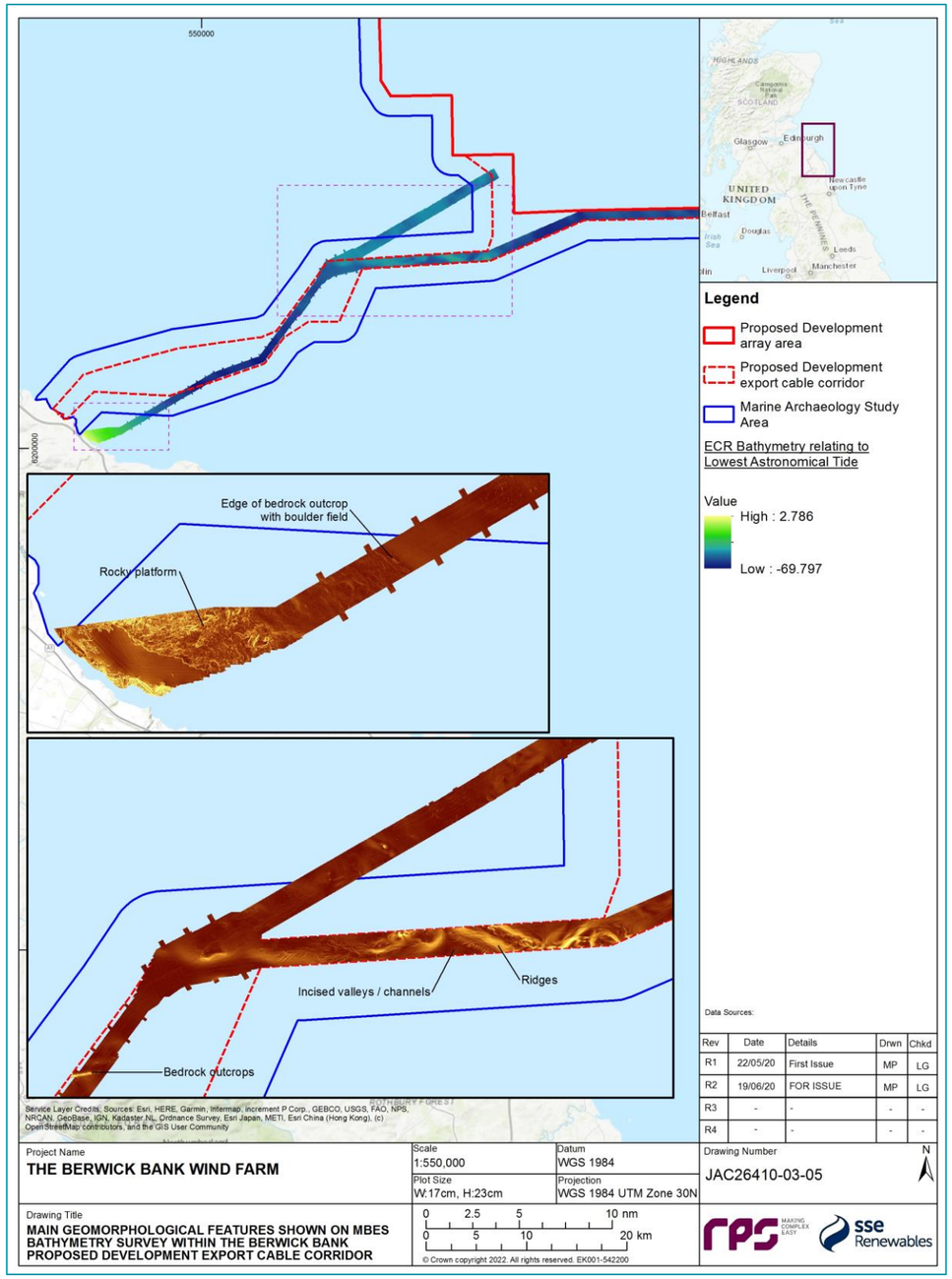

Figure 4.3: Main Geomorphological Features Shown on MBES Bathymetry Survey

4.2. SUBMERGED PREHISTORIC ARCHAEOLOGY

75. This section characterises the potential for submerged prehistoric archaeology to be present within the marine archaeology study area. For example, deposits containing archaeological material (e.g., flint tools), or submerged landscapes. This section is informed by the geophysical baseline data and desk-based review of secondary sources cited within the text.

76. The archaeological/geological time periods set out in Table 4.1 are covered in chronological order in the sections below.

Table 4.1: Archaeological and Geological Timeline

Period	Age in Years Before Present (B.P.)	Notes
Holocene	10,000 B.P. – Present Day	Mesolithic, Neolithic, Bronze Age, Iron Age, Roman, Medieval, Post Medieval and Modern periods. Rise in sea level meant that marine archaeology study area inundated at this time although nearshore area potentially exposed at times in early Mesolithic. The Holocene is the current time period within the larger geological time scale known as the Quaternary Period.
Devensian from Post Late Glacial Maximum to Late Glacial Interstadial	18,000 .- 10,000 B.P.	Coincides with the Late Upper Palaeolithic and the early Mesolithic and the discovery of the earliest evidence of occupation in Scotland. Gradual and continuous retreat of Scottish ice cap. The marine archaeology study area was likely covered in ice sheet or submerged although near shore area may have been exposed during periods of marine regression
Devensian up to Late Glacial Maximum	c. 73,000-18,000 B.P.	Arrival in the UK of Late Middle Palaeolithic Neanderthals, who were followed approximately 31,000 B.P. by Early Upper Palaeolithic, anatomically modern humans (Homo sapiens). The marine archaeology study area was likely covered in ice sheet during this period.
Pre-Devensian	c. >780,000 – 73,000 B.P.	Earliest evidence of hominin occupation of the UK corresponding with Lower and Middle Palaeolithic. No evidence of hominin occupation in Scotland. The marine archaeology study area was likely covered in ice sheet or under water.

4.2.2. INTRODUCTION

77. The three major glaciations (Anglian, Wolstonian and Devensian) have shaped the submerged prehistoric landscape within the North Sea. The cyclical glacial periods throughout the Quaternary Period (Table 4.1) led to the formation of the thick sediment deposition encountered within the marine archaeology study area. It is possible that evidence of Palaeolithic artefacts and palaeo-landscapes have been deposited in the sediments whenever exposure of the sea floor may have occurred outside the limits of the ice. During these periods much of the Scottish landmass and seabed was likely to have been covered by successive ice sheets and so early archaeological deposits are unlikely. However, during interglacial stages when the glacier retreated and the sea level rose, periglacial (ice edge environments) and palaeo-shorelines developed. It is these areas that could have been exploited by early hominins.

78. However, there is an absence of early to middle Palaeolithic sites within Scotland. The earliest reliable evidence for human occupation in Scotland comes from a flint assemblage from Howburn Farm, South Lanarkshire. This evidence has been roughly dated to the Windemere Interstadial of the early Lateglacial period of late Upper Palaeolithic date (Ballin, Saville; Tipping *et al.*, 2010). This absence of early material

is likely due to sub-glacial conditions, but could be due to the effects of glaciation which could have destroyed/scoured away isolated finds or buried them beneath later glacial deposits. As such, evidence of early archaeological deposits or isolated finds should not be entirely ruled-out. Evidence from the rest of the UK supports the possibility of Palaeolithic finds, where Palaeolithic evidence pre-dates 780,000 B.P. and the pre-Anglian glaciation (Cromerian Glacial stage). For example, at Happisburgh on the north Norfolk coast, lower Palaeolithic flint artefacts and hominin footprints have been encountered in the Cromer Forest Bed Formation.

79. Tools and faunal remains potentially deposited during the Devensian, were found during offshore dredging works off the coast of Great Yarmouth in Norfolk, confirming the potential for Palaeolithic evidence to survive in underwater contexts (Wessex Archaeology, 2007). The discovery of an isolated flint scraper from a borehole sample on the Viking Bank in the North Sea also confirms that prehistoric deposits can survive within submerged landscapes (Flemming, 2004).

80. The recent Waterlands project funded by the Marine Aggregate Levy (ABP Marine Environment Research Ltd, 2010) has characterised the potential for palaeo-landscape material across the UK. The Waterlands project identified the North Sea area where the marine archaeology study area is located as 'low potential' for palaeo-landscape material. The seabed is thought to have been submerged or covered by ice since the last glacial maximum and further, the exposure of hard rock outcrops to the marine environment means that the preservation of archaeological or palaeo-environmental remains is unlikely.

81. The near shore/intertidal western extent of the Proposed Development export cable corridor lies in an area of known high potential for archaeology. Here, marine palaeo-landscape features and areas of dry land which are now submerged could once have been favourable areas of habitation (ABP Marine Environment Research Ltd, 2010). This ties in with Flemming's strategic environmental assessment of this part of the North Sea (Flemming, 2004). Flemming's study concluded that the potential for archaeological material relating to the Upper Palaeolithic and Mesolithic periods is low. However, the study acknowledges a period during the ice retreat of the Post Devensian phase (before the rising sea level covered the exposed seabed) when western extent of the marine archaeology study area may have been exposed and open for exploitation.

4.2.3. PRE-DEVENSIAN >780,000 B.P. – C73,000 B.P. LOWER AND MIDDLE PALAEOLITHIC

82. The earliest Quaternary deposits within the marine archaeology study area are represented by the Aberdeen Ground Formation. This formation is considered partially contemporary with some of the earliest deposits associated with hominid activity associated with the UK. For example, the Aberdeen Ground Formation is contemporary with the Cromer Forest Bed formation located at Happisburgh as discussed above and therefore of similar archaeological potential. However, glacial, and marine deposits characterise the Aberdeen Ground Formation within the marine archaeology study area. These are associated with environments that are not conducive for hominid activity, suggesting there is limited potential for in-situ remains. In addition, the formation pre-dates the earliest known evidence of hominid activity in Scotland suggesting the archaeological potential is very low. Redeposited remains may occur in secondary contexts eroded from formations present in other areas. As no such evidence has been found in Scottish contexts, the likelihood of redeposited remains dating to this period to be present within the marine archaeology study area is also low. However, fine grained sediments and organic remains including wood have been found within the formation suggesting some palaeo-environmental potential.

4.2.4. DEVENSIAN TO POST LAST GLACIAL MAXIMUM C73, 000 B.P. – 10,000 B.P. MIDDLE AND UPPER PALAEOLITHIC

83. There are no deposits dating from the later Middle Palaeolithic periods within the marine archaeology study area (early Devensian). The Wee Bankie, Marr Bank and St Abbs Formation provide evidence of glacial, glacial marine and marine conditions which characterised the area from the Last Glacial Maximum through to the Windermere Interstadial (a relatively warm period towards the end of the Devensian Glaciation).

84. As discussed above, the Wee Bankie Formation is more dominant in the western side of the Proposed Development array area and east of the Proposed Development export cable corridor and interpreted as terminal moraine or subglacial till. The Wee Bankie Formation is sub-glacial and therefore has no potential to contain *in situ* prehistoric remains.

85. Where the Marr Bank Formation meets the Wee Bankie Formation has been interpreted as potentially the interface between the Last Glacial Maximum (to the west) and the sea (to the east). This would corroborate with the Marr Bank Formation representing an outwash plain during the late Devensian. Evidence of a probable kettle hole is present within the Marr Bank deposit. These features often form foci for the accumulation of organic remains and, as such, can have a paleoenvironmental potential. In some areas, prehistoric archaeological remains have been found in association with these features.

86. The Marr Bank Formation is marine, fluvial, or deltaic. Whilst marine environments would have no potential for *in situ* material, the edges (if fluvial or deltaic environments) have the potential to be exploited by early human activity. The earliest known evidence for human activity in Scotland post-dates the deposition of this deposit. Given this and the close proximity of the deposit to the ice sheet, the archaeological potential for this deposit is considered to be limited.

87. Following the glacial retreat into the Firth of Forth (15,000 – 14,000 B.P.), the resulting rise in sea level meant that the marine archaeology study area would have been submerged by cool arctic waters. The coastline would therefore potentially have been located much further to the west. This correlates with the deposition of the St Abbs Formation and suggests that this deposit has a low archaeological potential. However, the possible presence of peat recorded within the Proposed Development export cable corridor does suggest that this deposit does have a palaeo-environmental potential.

88. The Marr Bank Formation was deposited during the Windemere Interstadial when the marine archaeology study area was submerged. Consequently, the archaeological potential of this deposit is low although toward the end of the Interstadial, relative sea level may have reached close to present day levels and consequently the intertidal zone (not considered part of this assessment) and near shore area was likely to have been exposed during this period. Therefore, where upper parts of the Largo Bay Member have been identified in the nearshore areas there may be some archaeological potential.

89. During the Loch Lomond (Younger Dryas) Stadial (c13,000 – 12,000 B.P.) colder conditions were established and once again ice sheet expansion led to a drop in sea level. Around the east coast of Scotland this now submerged shoreline (termed the Main Late Glacial Shoreline) has been recorded. A bedrock platform identified within the nearshore area of the Proposed Development export cable corridor may tie in with the Main Late Glacial Shoreline and could represent an area of archaeological potential during the late Upper Palaeolithic/Early Mesolithic periods. Deposition of the St Andrews Bay Member of the Forth Formation, thought to have begun in this cold period, is recorded across the bulk of the Proposed Development export cable corridor. The glacial conditions of this stadial may have rendered the area largely unfavourable for human habitation however archaeological evidence cannot be entirely ruled-out in the nearshore areas. This potential is dependent on the nature of the St Andrews Bay Member/seabed sediment and future geotechnical investigations in this area will shed further light on this.

4.2.5. EARLY HOLOCENE 10,000 B.P. – 6000 B.P. MESOLITHIC

90. Deposits within the marine archaeology study area and particularly the Forth Formation, may have the potential to contribute to our understanding of relative sea levels. On the basis of the available evidence, the marine archaeology study area has been inundated for much of the Holocene and whilst near shore areas may have been exposed during the early Holocene, the current intertidal zone may have been characterised as such from the mid Holocene. Extensive shell middens identified in excavations along the east coast, the Forth and a short distance inland from the Firth of Forth indicate that the intertidal and nearshore areas were exploited during the Mesolithic period. Excavations were carried out at Echline, South Queensferry from 2010-2011 at which a Mesolithic sunken-floored structure and possible other Mesolithic structures were uncovered (Dingwall et al., 2011). The Echline area where these excavations were carried out would have had easy access to the maritime and coastal resources of the Firth of Forth. Other examples of Mesolithic activity have been located along the south of the Firth of Forth including evidence of temporary settlement activity at Cramond. A Mesolithic shell midden was found at Stannergate at Dundee adjacent to the Tay Estuary. This shell midden would once have been located closer to the shoreline, confirming the exploitation of the shoreline during this period (Dunwell and Ralston, 2008). There is therefore the potential for archaeological remains to occur within the nearshore area of the Proposed Development export cable corridor within the Forth Formation deposits although erosion and reworking of deposits may have disturbed or removed any evidence.

91. Overall based on the available evidence it is considered unlikely that evidence of *in situ* submerged prehistoric archaeology survives within the Proposed Development site apart from the near shore area of the Proposed Development export cable corridor which is considered to have a heightened archaeological potential based on the survey results recorded to the south. Figure 4.4 identifies the extent of this potential based on the extents of Unit A and B in the nearshore (and intertidal zone) extending outward to the possible Late Glacial Shoreline. If any *in situ* evidence is encountered it could be considered to be of local, regional to national importance.

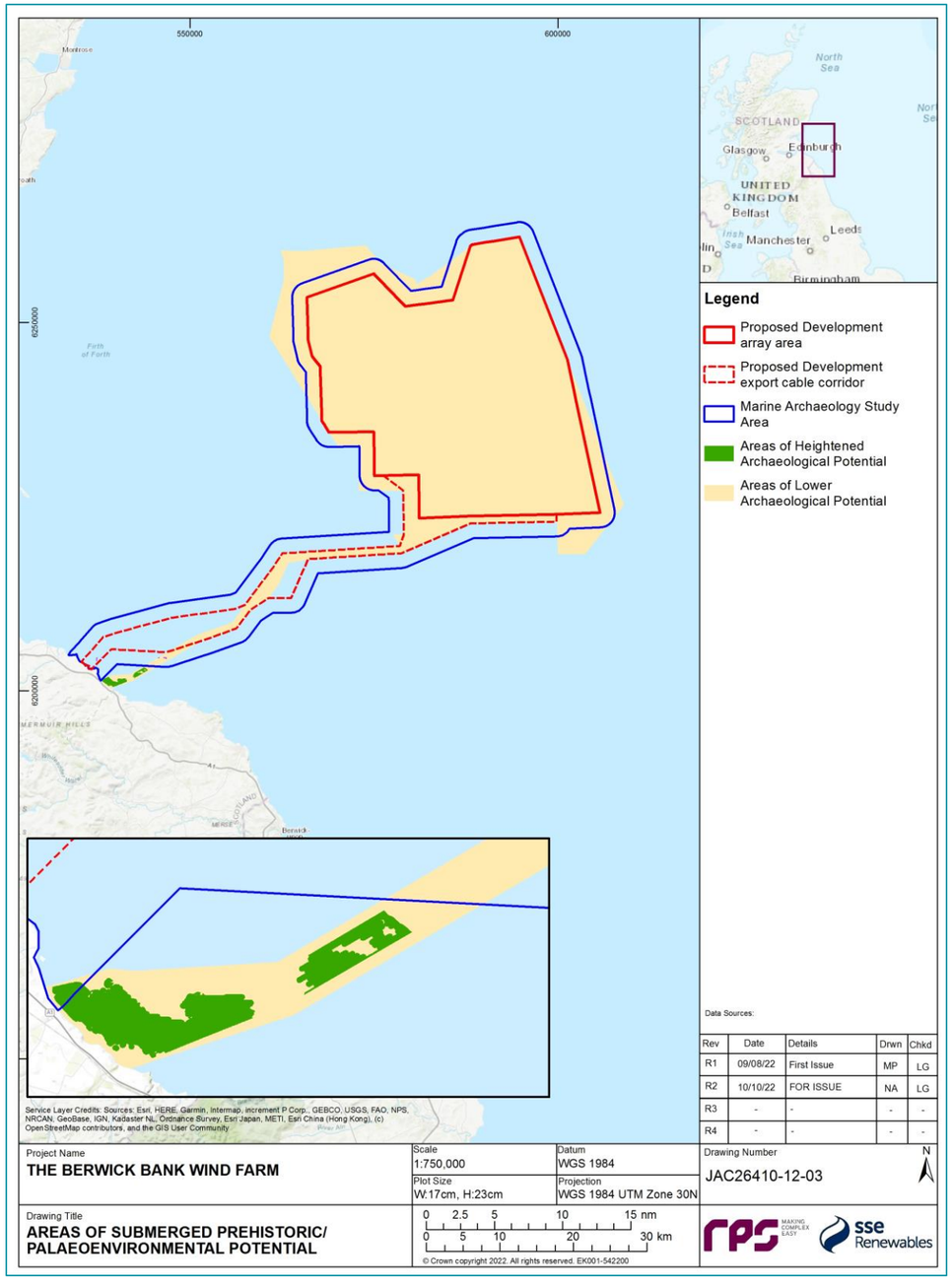

Figure 4.4: Areas of Submerged Prehistoric/Palaeo-Environmental Potential

4.3. MARITIME ARCHAEOLOGY

92. The maritime archaeology of the UK is the product of a complex interplay of constantly evolving coastal and marine activities, international links and patterns of shipping, and sea use since the earliest human occupation of the UK during the late Palaeolithic to the Mesolithic. By the end of the Mesolithic, the marine archaeology study area had been inundated and was a fully marine environment. This section reviews the presence (and potential presence) of maritime archaeology within the marine archaeology study area associated with these maritime activities, such as shipwrecks, associated material, and aviation archaeology. Military remains are also covered within the scope of the maritime archaeology considered in this section.

93. Through this section, the maritime archaeological record of the marine archaeology study area has been considered chronologically for the following broad temporal phases: Early Prehistoric, Neolithic and Bronze Age, Iron Age and Roman, Early Medieval and Medieval, and Post-Medieval and Modern. The archaeological potential considered for these temporal phases are summarised in Table 4.2.

94. Records of known wreck sites and losses in UK waters are biased towards the Post-Medieval and Modern periods and therefore the precise locations of most wrecks pre-dating these periods in UK waters are not known. The majority of known and recorded wreck sites lie relatively close to the coast. The proximity of many historical sailing routes to the coast and the natural hazards of the North Sea can be expected to have been a determining factor in many maritime casualties in the past (Wessex Archaeology, 2004). Designated, known and recorded wrecks explored in greater detail in section 4.4.

4.3.2. EARLY PREHISTORIC (PALAEOLITHIC TO MESOLITHIC)

95. There is currently no evidence in the UK for maritime archaeological remains pre-dating the start of the Holocene. However, there are examples from elsewhere in the world which suggest that primitive watercraft were in use by the Middle Palaeolithic period, such as the suggestion that the colonization of Australia approximately 40,000 B.P. involved island-hopping in or on primitive watercraft (Lourandos, 1997).

96. During the Late Upper Palaeolithic (approximately 12,000 B.P.), it is possible that simple watercraft such as log boats or rafts were used for coastal journeys and fishing within the British Isles (Wessex Archaeology, 2007; Dunkley, 2016), however no evidence of Palaeolithic sea-faring craft is currently known.

97. The first archaeological evidence for the use of watercraft in the UK dates to the Mesolithic (approximately 10,500 to 6,000 Before Christ (B.C.)) and is from Star Carr in Yorkshire where fragments of a wooden oar have been identified (Van de Noort, 2011, Wessex Archaeology, 2007). A late Mesolithic/early Neolithic burial in a partially burnt dugout canoe was found in St. Albans, Hertfordshire in 1988 (Dunkley, 2016). Finds in Germany and Denmark suggest that logboats were used for coastal journeys.

98. Watercraft may have been used in the rivers and estuaries during the Mesolithic for coastal journeys, fishing expeditions, and possibly longer journeys in favourable weather. The evidence of the exploitation of the coastal resource by this period suggests the possible use of watercraft during this period. They are likely to have become increasingly important to the Mesolithic inhabitants with rising sea levels. However due to the paucity of evidence and fluvial activity across the marine archaeology study area, the potential for the survival of any archaeology associated with the maritime environment from the Palaeolithic and Mesolithic periods is considered unlikely.

4.3.3. NEOLITHIC AND BRONZE AGE

99. No evidence of Neolithic or Bronze Age maritime activity has been recorded within the marine archaeology study area.

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

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

102. The Bronze Age (approximately 1,800 to 600 B.C.) was a period of technological innovation and of expansion of trade and exchange networks, facilitated by the introduction of new forms of boats both for ocean and coastal/riverine trade. Clear advances occurred in maritime technology during this period and an increasingly substantial maritime archaeological record allows a less speculative understanding of maritime culture than for earlier periods.

103. A number of logboats recorded in Scotland date from the Bronze Age including one from the intertidal zone of the Tay estuary (Strachan, 2004). Inland close to the shore of Linlithgow Loch a logboat was uncovered during the excavations of foundations in the late 19th century at Linlithgow in West Lothian (Mowat 1996). Hide boats are argued to have been a common vessel during this period and sewn plank boats were a new development (Van de Noort, 2011). The latter have been described as the most advanced form of early water transport and would have been readily adaptable for use in riverine, estuarine and possibly even sea-going environments (Lillie, 2005). There have been several examples of these flat-bottomed sewn plank boats found, ranging from the Brigg ‘raft’ (dated to 825 to 760 B.C.) (Chapman and Chapman, 2005; McGrail, 1981) and North Ferriby boats (built between approximately 2,000 to 1,700 B.C.) from the Humber (Cunliffe, 2001; Van de Noort, 2003), and the substantial remains of a boat from Dover in Kent which is particularly significant for its sea-going capabilities (Clark, 2002). No evidence of this type of craft have been recovered from the Firth of Forth and Tay, or within the marine archaeology study area.

104. The proximity of the marine archaeology study area to possible shipping routes across the North Sea and up and down the east coast suggests that during the Bronze Age, vessels may have been passing through the marine archaeology study area. It is therefore considered that there is a low to moderate potential for remains of such vessels to be present within the marine archaeology study area.

4.3.4. IRON AGE AND ROMAN

105. No evidence of Iron Age or Roman maritime activity has been recorded in the marine archaeology study area.

106. Extensive maritime activities in the North Sea during the Iron Age (approximately 600 B.C. to Anno Domini (A.D.) 43) and during the Roman occupation of Britain (A.D. 43 to 410) are well-documented, and there is good evidence of regular trade from the Continent, including Roman trade between Britain and the Rhine provinces (Milne, 1990).

107. A distinct tradition of substantial, sea-going vessel (known as the ‘Romano-Celtic’ type) was developed in north-western Europe during the later Iron Age (Marsden, 1994). Examples include the Blackfriars boat from London (Marsden, 1994; Dunkley, 2016) and the Barlands Farm boat, from the Severn Estuary in southeast Wales (Nayling and McGrail, 2004).

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

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

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

4.3.5. EARLY MEDIEVAL AND MEDIEVAL

111. No evidence of Early Medieval and Medieval maritime activity has been recorded within the marine archaeology study area.

112. The decline of the Roman navy (Classis Britannica) in the 5th century A.D. left the sea around Britain open for others to use. Maritime activity in the North Sea and in the vicinity increased during the Early Medieval period. This was due, in part, to Viking raiding, the intensification of regional trade and migration that followed, and the growth of a number of major ports on the east coast of the UK (Hutchinson, 1997; Friel, 2003).

113. The Viking presence and influence along the east coast of the UK would have demanded the control of rivers and estuaries which secured access to trade routes and passage across the North Sea. Evidence of Viking influence close to the marine archaeology study area is reflected in place names and also the location of Viking hoards along the Forth and Tay estuaries (Owen, 1999). Evidence for Viking vessels has been found in Orkney and there is a number of accounts of maritime travel from Orkney.

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

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

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

117. The level of medieval maritime activity within the North Sea suggests that the potential presence of Medieval period shipwrecks within the marine archaeology study area is moderate.

4.3.6. POST MEDIEVAL AND MODERN

118. The growth of commercial maritime trade beginning during the Late Medieval period continued and expanded in the Post Medieval period. Alongside overseas ventures which were expanding rapidly, inland and local coasting trade continued to be important in the region in the Post Medieval period. During this period, the number of vessels crossing the North Sea increased significantly, particularly after the Tudor period and the establishment of the Royal Navy in the 16th century. The marine archaeology study area was therefore an area of concentrated commercial and military maritime activity.

119. From the 18th century onwards, records were kept of ship losses, with records becoming more detailed from the 19th century. Rapid industrialisation in the 18th and 19th centuries revolutionised shipbuilding, introducing technological innovation that precipitated fundamental changes in maritime technology. By the end of the 19th century with the advent of the steam engine, the introduction of iron hulls and the development of the screw propeller had wrought major transformations on ships and shipping (Lambert, 2001). Although steam and steel came to dominate shipping during the 19th century, there remained a strong local core of maritime activity around much of the coast of the UK which retained the more traditional, often wooden vessel types. For example, at the turn of the 20th century, much of the fishing in the North Sea was still conducted by fleets of sailing smacks and there was a rise in fishing settlements along the east coast during the 18th and 19th centuries. Many of the losses in this area reported from this period are of former fishing vessels.

120. A large number of wrecks recorded in this part of the North Sea are from major storm events (Ferguson, 1991). All but one of the wrecks recorded close to the shore in the UKHO data within the Proposed Development export cable corridor were lost due to a storm event (see section 4.4).

121. The increasing incorporation of metal structural elements into vessel designs during this period means that wrecks for the 19th and early 20th centuries are often more visible on the seabed than their wooden predecessors. They are visible to geophysical survey, and also generate strong magnetic anomalies, and this greater visibility is reflected in the increased number of known wrecks (i.e., those that have been located on the seabed) for the period under discussion, in contrast to the periods discussed previously. All known wrecks recorded within the marine archaeology study area date from the late 19th and early 20th centuries (see section 4.4)).

122. The potential for unrecorded archaeology to be discovered within the marine archaeology study area dating to the Post Medieval period is therefore considered to be moderate to good and from the 18th and 19th century onwards is good.

4.3.7. MODERN MILITARY REMAINS

123. The maritime archaeological record of the 20th century until the present day is dominated by remains associated with the First and Second World Wars. Warships, submarines, and U-boats along with cargo vessels, personnel transport vessels and aircraft, comprise the losses during this period. The majority of known shipwrecks in the North Sea basin within which the marine archaeology study area is located are the results of military activity. It is thought that initial losses in the First World War were due to the blackouts along the coast which led to wrecks along the shoreline, and then the subsequent U-boat offensive which sunk a number of Royal Navy submarines (and U-boats) in the Outer Tay and Forth and North Sea basin (Ferguson, 1991). During the Second World War, approximately 50 merchant vessels were sunk off the north-east coast, along with military vessels (Headland Archaeology, 2011). All but one of the known wrecks recorded by the UKHO within the Proposed Development array area were merchant ships lost due to military action (see section 4.4).

124. A substantial number of military and civilian aircraft casualties have occurred in UK waters since the advent of powered flight in the early 20th century. The bulk of these are casualties of the Second World War, mostly concentrated off the south and southeast coasts of England, as the majority of air combats and military airfields were based here. Records of aircraft losses at sea are seldom tied to an accurate position, further complicating an assessment of the likelihood of aircraft wreckage on the seabed. However the identification of aircraft wrecks has become increasingly common in recent years, with a number located in the course of surveys carried out in support of seabed development.

125. Only a small number of British and German aircraft and airships are recorded as being lost around the UK during the First World War (Wessex Archaeology, 2008). Although it is possible that some of these losses occurred in the North Sea, no evidence for the First World War aircraft casualties within the marine archaeology study area has been identified. The lightweight construction of these early airframes also means they are unlikely to survive unless buried in seabed sediments.

126. According to Bédoyère (2001), during the Second World War an average of five aircraft were lost over the UK every day, many of these losses occurring over the sea. A small number of offshore aircraft losses have been recorded off the north-east coast of Scotland and a number of military bases are located in the vicinity of the marine archaeology study area such as Leuchars and Crail, which were Royal Air Force (RAF) bases in use during both World Wars. One of the first German aircraft shot down during the Second World War was during an attack on the Royal Navy by 12 German aircraft in the Firth of Forth in October 1939 (Headland Archaeology, 2011).

127. The aviation archaeology record is potentially very large, but the ephemeral nature of aircraft wrecks ensures that many sites remain unrecorded. The current available evidence does not provide a precise location of any aircraft crash sites. RAF Second World War Air/Sea Rescue operation distribution maps record a large number of operations in and around the marine archaeology study area (Wessex Archaeology, 2008) and whilst the mapped locations of these operations are not wholly reliable, they provide a useful general guide to these operations in the area and support the other evidence for a potentially substantial number of aircraft wrecks in the marine archaeology study area.

128. Since the Second World War there have been few aviation losses and therefore post-war aircraft remains are unlikely to be discovered.

129. On the basis of the information presented above, it is considered that there is a moderate to good potential for modern military maritime and aviation archaeological sites and material on the seabed of the marine archaeology study area.

4.3.8. SUMMARY

130. The archaeological potential by period, and the likely significance or value of any archaeological remains which may be present within the marine archaeology study area are summarised in Table 4.2. The significance of any remains is dependent on their state of preservation.

Table 4.2: Summary of Archaeological Potential and Value

Receptor	Potential	Value
Submerged Prehistoric archaeology	Low-Moderate	Local to National
Palaeoenvironmental evidence	Moderate	Local to National
Early Prehistoric Maritime Evidence	Low	National
Bronze Age Maritime Evidence	Low to Moderae	National
Iron Age and Roman Maritime Evidence	Low to Moderate	National
Early Medieval and Medieval Maritime Evidence	Moderate	Regional/National
Post Medieval and Modern Maritime Evidence	Moderate to Good	Local/Regional/National
Modern Military Remains	Moderate to Good	Local/Regional/National

4.4. DESIGNATED, KNOWN AND RECORDED WRECKS

131. This section correlates the results of a review of UKHO, NRHE and HER data to establish designated, known and recorded maritime archaeology within the marine archaeology study area.

4.4.2. DESIGNATED WRECKS

132. There are no historic MPAs designated under the Marine (Scotland) Act 2010 within the marine archaeology study area.

133. U 12 was a submarine built in 1908-1911 in Danzig, Germany and in March 1915 was patrolling the east coast of Scotland when she was rammed by HMS Ariel and subsequently came under fire. Ten crew managed to escape before she sunk and 19 crew were lost. The wreck lies within the west of the marine archaeology study area but outside the Proposed Development array area (Figure 4.5) and has been declared a war grave and so falls under the protection of the Protection of Military Remains Act. It is therefore considered a designated heritage asset despite the absence of a record of its designation in the available baseline information.

4.4.3. KNOWN WRECKS AND RECORDED LOSSES

134. Data for known ship and aircraft wrecks and any recorded shipping losses were obtained as appropriate from the UKHO, the National Record of the Historic Environment (NRHE) held by HES and the Scottish Borders and East Lothian Historic Environment Record (HER). The UKHO, HER and NRHE datasets provide a general picture of maritime casualties in the last 150 to 200 years but should also not be viewed as representing the totality of even the more recent potential maritime archaeological remains in the area (Figure 4.5).

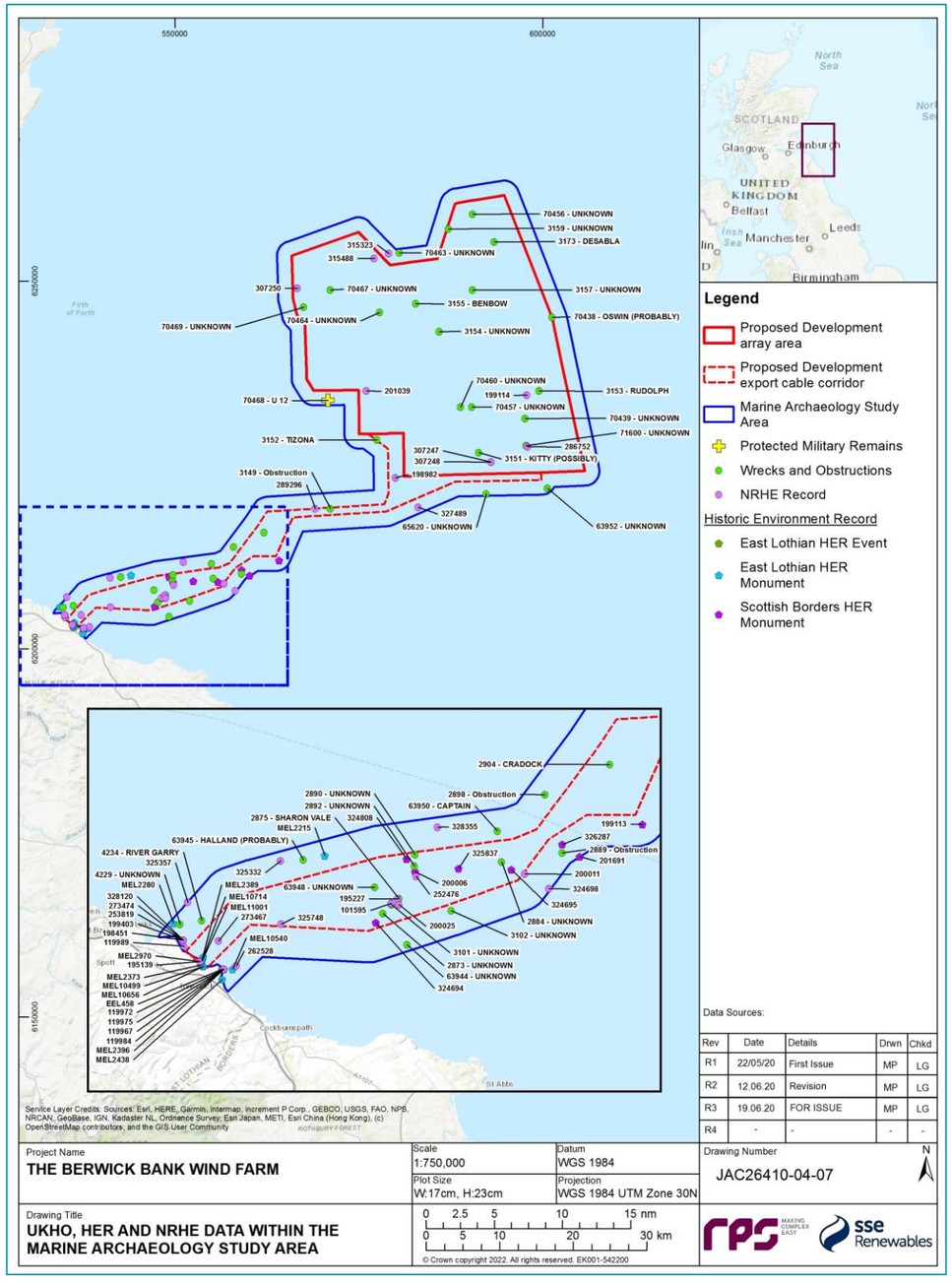

Figure 4.5: UKHO, NRHE and HER Data within the Marine Archaeology Study Area

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

136. Previously charted wrecks or obstructions not located during subsequent surveys may have had their status amended by the UKHO to "dead". This may be the result of mistaken identification when first identified, inaccurate coordinates, the degradation/destruction of the wreck, or its burial by sediment. This cannot be taken to imply that the wreckage is no longer on the seabed and the location may still contain remains of archaeological interest. However, a reasonable assumption can be made that the wreck is not verified to that specific location if following the project specific geophysical survey, the wreck is still not located at that position. All UKHO records in the marine archaeology study area are thus discussed below, regardless of their current status. The UKHO holds data for a total of 47 wrecks and obstructions (27 live records and 20 dead records) within the marine archaeology study area.

137. The Gazetteer at annex A lists all the UKHO data within the marine archaeology study area.

138. The marine component of the NRHE originally comprised just the UKHO Wreck Index and as such there is a potential for an overlap of records (for the purpose of this report any repeated data has been removed). This database has since been enhanced by the addition of substantial numbers of historical records of shipping and aircraft casualties, drawn from a range of principally documentary and archival sources. Positions given are often not precise. Often the locations are aggregations at a single, arbitrary position of one or more maritime records for which no other grid reference or position is available. These positions reflect general loss locations, usually drawn from descriptions in the documentary records, or the indicative positions of seabed finds and do not (except by chance) relate to the position of the physical remains of the sites on the seabed which they list.

139. The NRHE held by HES holds data for 48 wrecks and obstructions within the marine archaeology study area. The Gazetteer at annex B lists all the NRHE data within the marine archaeology study area. However, only one has a verified location whilst the remainder are all unverified locations obtained from documentary sources such Whitaker (1998) and Baird (1993).

140. The marine component of the Scottish Borders and East Lothian HERs generally comprises records obtained from the UKHO Wreck Index and documentary sources such as Whitaker and Larn and Larn (1998). There is therefore an overlap with some of the UKHO and NRHE data discussed above (any repeated data has been removed). However, the HERs also hold additional data not included on the UKHO or NRHE, this data has also been obtained from documentary sources and as a result none of the wreck locations have been verified.

4.4.4. PROPOSED DEVELOPMENT ARRAY AREA

141. A total of 15 wrecks are recorded on the UKHO data records to lie within the Proposed Development array area, five of which are known; Desabla, Kitty, Rudolph, Benbow and Oswin:

- Desabla was built in 1913 in Newcastle and was a British Tanker on passage from Port Arthur, Texas carrying linseed oil in 1915 when it was shelled by a German submarine, the crew abandoned ship and it was later sunk by charges, no lives were lost. The UKHO records its position as dead however the wreck was discovered by divers in 2010 lying on its port side (content available on the Wrecksite database accessed in August 2021 www.wrecksite.eu).
- Kitty was built in 1898 in Hull and was a fishing trawler on passage to Peterhead for fishing when it was captured by submarine and sunk by explosives in 1917. No lives were lost.

- Rudolph was built in 1922 and was on passage from Hartlepool to Malmo carrying coal when it was mined. Its charted position has not been verified by survey and so its position is recorded as dead.
- Benbow was a British fishing trawler built in 1898 and was scuttled by a German submarine in 1917. No lives were lost. Its charted position has not been verified by survey and so its position is recorded as dead.
- Oswin was built in 1890 in Whitby, it was a cargo ship on voyage to Goteburg carrying coal when it was sunk by a German submarine in 1918. No lives were lost.

142. The NRHE records a further seven wrecks within the Proposed Development array area although their positions are not verified.

143. No wrecks or other archaeological finds have been recorded on the Scottish Borders and East Lothian HER within the Proposed Development array area.

4.4.5.2 KM BUFFER AROUND PROPOSED DEVELOPMENT ARRAY AREA

144. UKHO data records five wrecks within the 2 km buffer around the Proposed Development array area and only two are known, the U12 Designated Wreck discussed above and Tizona.

145. The NRHE records two wrecks within the 2 km buffer.

146. No wrecks are recorded on the Scottish Borders or East Lothian HER within the 2 km buffer.

4.4.6. PROPOSED DEVELOPMENT EXPORT CABLE CORRIDOR

147. A total of seven wrecks and one obstruction (geological) are recorded in the UKHO to lie within the Proposed Development export cable corridor, three of which are known; Craddock, Sharon Vale, Tizona.

- Craddock was built in 1919 and was bombed and sunk by German aircraft. Its charted position has not been verified by survey and so its position is recorded as dead.
- Tizona was a Norwegian steam built in 1901 and in 1917 was on passage from London to Christiana carrying coke when it was captured and sunk by a German submarine, no lives were lost.
- Sharon Vale was a British fishing ship which sunk in 1979 when its hold became flooded, and the bulkhead failed. Its charted position has not been verified by survey and so its position is recorded as dead

148. The NRHE records an additional eight wrecks within the Proposed Development export cable corridor.

149. The Scottish Borders HER records an additional four wrecks within the Proposed Development export cable corridor, none of which are named. The East Lothian HER records an additional six wrecks within the Proposed Development export cable corridor.

4.4.7.2 KM BUFFER AROUND THE PROPOSED DEVELOPMENT EXPORT CABLE CORRIDOR

150. There are nine wrecks and two obstructions recorded on the UKHO within the 2 km buffer around the Proposed Development export cable corridor and four are known:

- Halland which was built in 1923 and owned by the Ministry of Shipping at time of loss. It was on passage for London from Dundee when it was bombed and sunk by Germain aircraft.
- River Garry was built in 1883 in Belfast and was a cargo ship carrying coal on passage from Leith to London when in 1893 it foundered in a Force 12 storm after being driven ashore. All lives were lost.
- Captain was built in 1898 and was foundered nine miles north-east of St Abbs Head.
- Sharon Vale was a British fishing ship which sunk in 1979 when its hold became flooded, and the bulkhead failed. Its charted position has not been verified by survey and so its position is recorded as dead.

151. The NRHE records an additional 12 wrecks within the 2 km buffer around the Proposed Development export cable corridor.

152. The Scottish Borders HER record an additional three wrecks within the 2 km buffer.

153. The East Lothian HER record an additional five wrecks within the 2 km buffer. In addition, the HER records that ballast potentially associated with the wreck HMS Nymph was recorded during an underwater survey in 1973 (EEL458 Figure 4.5).

4.5. ARCHAEOLOGICAL ASSESSMENT OF SEABED CONTACTS IDENTIFIED DURING GEOPHYSICAL SURVEY

154. This section reviews the archaeological potential of seabed contacts identified during the archaeological assessment of the site-specific geophysical surveys.

155. A total of 244 anomalies of potential anthropogenic origin have been identified during the site-specific geophysical surveys within the Proposed Development site. Of these 197 were identified within Proposed Development array area. Forty-seven were identified within the Proposed Development export cable corridor (although, geophysical survey was not undertaken across the full extent of the Proposed Development export cable corridor).

156. In all, 11 contacts were rated as being confirmed high archaeological potential within the Proposed Development site and 25 of unconfirmed medium archaeological potential. A total of 208 sites of low archaeological potential were recorded within the Proposed Development site. Anomalies of low potential have been assessed against all available evidence and as a result are considered unlikely to have any archaeological significance and are not discussed further in this report.

157. The positions of the archaeological contacts of high and medium potential are shown in Figure 4.6 (and listed in annex C gazetteer of potential archaeological anomalies, annex D wreck sheets: high potential archaeological anomalies and annex E information sheets: medium potential archaeological anomalies). These are summarised in Table 4.3 below.

Table 4.3: Distribution of Anomalies by High and Medium Archaeological Potential

Archaeological Potential	Survey Area	Number of Contacts
High	Proposed Development array area	11
	Proposed Development export cable corridor	0
Medium	Proposed Development array area	20
	Proposed Development export cable corridor	5

158. In addition, a total of 106 magnetic anomalies with an intensity >100 nT with no correlating seabed contact were identified within the Proposed Development boundary. Of these, 37 lie within the Proposed Development array area, and 69 within the Proposed Development export cable corridor. These anomalies have the potential to represent material of potential archaeological significance and their positions are shown in Figure 4.6 and listed in annex F. A large proportion of these large magnetic anomalies form defined linear features the distribution of which lies within the Proposed Development export cable corridor

and likely represent redundant cables, chain etc although there remains the potential for some of these anomalies to represent material of archaeological interest.

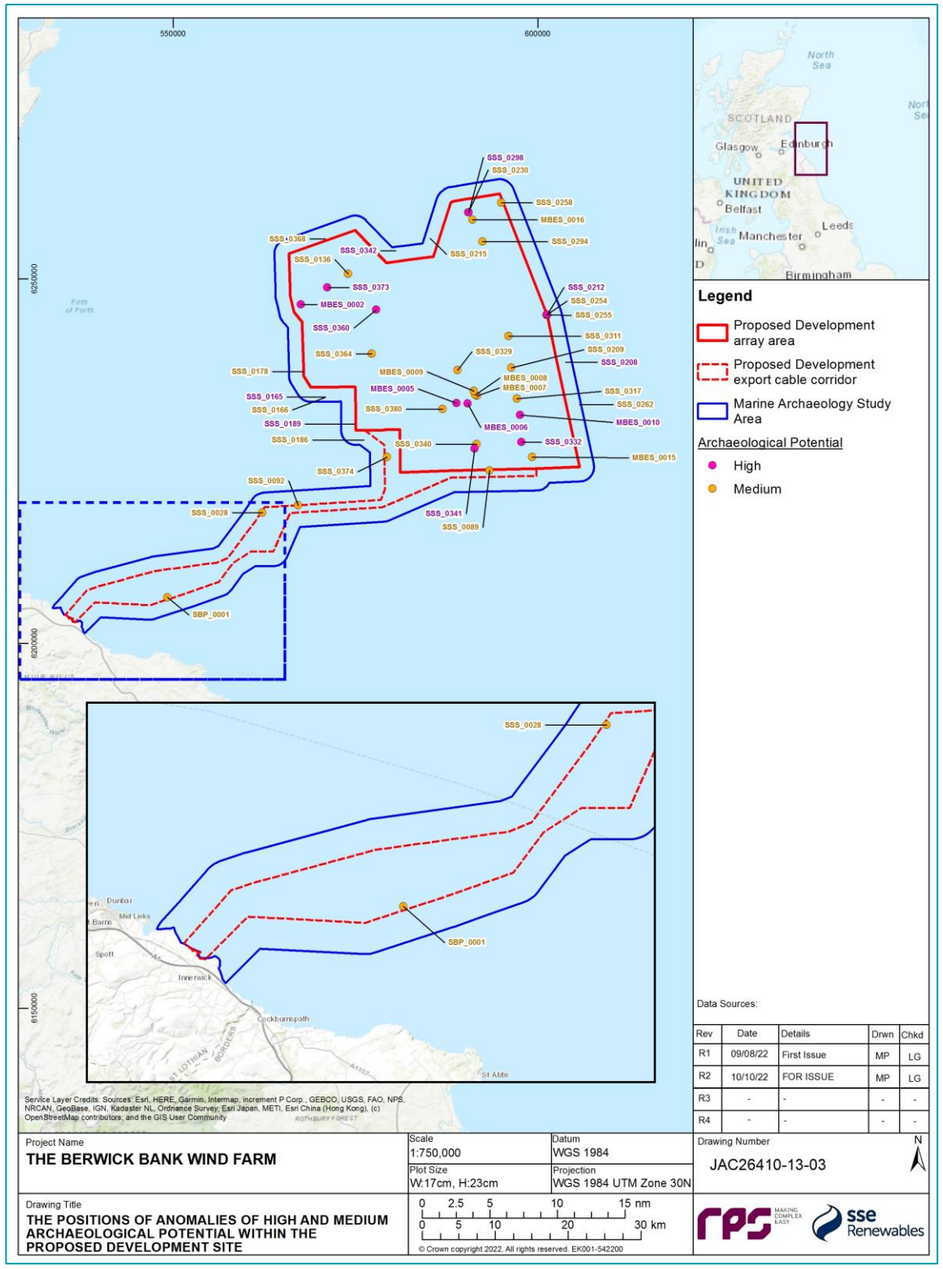

Figure 4.6: The Positions of Anomalies of High and Medium Potential within the Limits of the Proposed Development

4.5.1 PROPOSED DEVELOPMENT ARRAY AREA

High potential anomalies

BBMB_SSS_2020_0298 (annexes C and D)

159. BBMB_SSS_2020_0298 lies within and to the north of the Proposed Development array area and is the degraded, but coherent, remains of a wrecked vessel measuring 76.2 m x 19.7 m and with an associated magnetic anomaly of 59,127.2 nT. The wreck shows evidence of collapse along the length with debris extending to the seabed from the middle section. Debris is noted within the immediate vicinity of the wreck, including medium potential BBMB_SSS_2020_0298. The anomaly lies approximately 25.0 m west of the northern end of the wreck. The form is boulder like, however the proximity to the wreck could potentially indicate related debris. The form of the wreck, and the significant magnetic anomaly indicates metal construction.

160. Extending from the wreck, 160 m to the south, is what appears to be an anchor and chain. It is unclear as whether the wreck and the anchor are related or whether is a later deposit.

161. The wreck is recorded by the UKHO under record 70456 and was first identified in 2007, through survey, as an upright wreck measuring 77.0 m x 24.6 m and broken in three sections. Current data indicates that whilst the wreck is in poor condition any breaks in the structure are likely as a collapse rather than separation during the sinking event. The identity of the vessel is unknown.

BBMB_SSS_2020_0212 (annexes C and D)

162. BBMB_SSS_2020_0212 lies on the eastern boundary of the Proposed Development array area and is the coherent remains of a wrecked vessel measuring 91.6 m x 37.7 m with an associated magnetic anomaly of 1,056.7 nT. The wreck appears to be lying on its side and orientated north-east, south-west. The whole wreck shows evidence of collapse, but it is more prominent to the south-west. Large debris is visible adjacent to the main wreckage along the south-eastern edge. Two further pieces of debris likely related to the wreck are visible 50.0 m to the west (BBMB_SSS_2020_0254) and 60.0 m to the south (BBMB_SSS_2020_0255). Scour is visible around the wreck; however, it appears fairly localised.

163. The wreck is recorded by the UKHO under record 70438 as the probable wreck of the Oswin, a Swedish steamship sunk in 1918. The wreck was located in 2007, through survey. Following a diving investigation in 2009 and the description provided by the divers the wreck was identified as probably that of the Oswin. Discrepancies between the current remains on the seabed and the as-built dimensions are likely a result of the collapse of the wreck.

164. The potential wreck is not recorded by the UKHO but could potentially be one of the unverified wrecks recorded on the NRHE (Figure 4.4).

BBMB_MBES_2020_0005 (annexes C and D)

165. BBMB_MBES_2020_0005 lies towards the south of the Proposed Development array area and is the remains of a broken-up vessel over an area 41.5 m x 12.3 m. The visible remains appear to show one section of the wreck lying east, west, potentially the bow, to the north and further visible debris to the south. Scour is evident to the south and east of the main section of wreckage. It is not possible to determine the construction type with the data available.

166. The wreck is recorded by the UKHO under record 70460 and was first identified in 2007, through survey, as a highly degraded wreck measuring 70.5 m x 34.4 m. The differences in observed measurements are likely the result of sediment movement or continued degradation since 2007.

BBMB_MBES_2020_0006 (annexes C and D)

167. BBMB_MBES_2020_0006 lies towards the south of the Proposed Development array area and is the remains of a wrecked vessel measuring 28.5 m x 8.5 m lying east, west, and with prominent scour to each end. The form of the wreck is coherent and likely of metal construction. There is little evidence of outlying debris.

168. The wreck is recorded by the UKHO under record 70457 and was first identified in 2007, through survey, as an intact wreck measuring 46.2 m x 12.2 m with bows to the east and a list to port. There is a notable difference in dimensions, however there is no evidence of degradation or burial that would account for this, a likely assessment is that a previous build up seabed at each end of the wreck distorted the overall measurements in 2007.

BBMB_MBES_2020_0010 (annexes C and D)

169. BBMB_MBES_2020_0010 lies within the southern area of the Proposed Development array area and is the broken up remains of a wrecked vessel measuring 34.0 m x 10.7 m. The form of the wreck suggests steel construction with the bow to the north. The wreck is in two distinct, and separated, sections with further evidence of an addition break to towards the stern. The wreck sits within an area of scour, more prominent to the bow and the stern. There is little evidence of outlying debris.

170. The wreck is recorded by the UKHO under record 70439 and was first identified in 2007, through survey, as an intact, upright wreck, 32.0 m x 9.0 m with the hold visible. Whilst the current dimensions correlate with those from 2007 the wreck can no longer be classed as intact.

BBMB_SSS_2020_0341 (annexes C and D)

171. BBMB_SSS_2020_0341 lies to the south-west of the Proposed Development array area and is the remains of a small vessel measuring 33.5 m x 7.6 m. The wreck is coherent in form, upright, and with the bow to the south. There is evidence of collapse amidships with the bow and stern remaining prominent. There is potentially small, localised debris towards the bow on the port side. Slight scour is evident around the wreck, more prominent towards the bow.

172. The wreck is recorded by the UKHO under record 3151. The current position was established during survey works in 2007 and described as an upright, intact wreck measuring 45.2 m x 11.3 m. The wreck has been identified as possibly that of the Kitty, a British trawler sunk in 1917. The Kitty was built in 1898 by Earle's Co Ltd in Hull as 32.0 m x 6.4 m which conform with the dimensions recorded in the data to which this report pertains.

BBMB_SSS_2020_0332 (annexes C and D)

173. BBMB_SSS_2020_0332 lies within the southern area of the Proposed Development array area and is the remains of a small vessel measuring 35.6 m x 8.6 m. The visible remains of the vessel potentially indicate the bow lies to the south-east. There is evidence of outlying debris within the immediate vicinity of the wreck. Scour is present, although conversely there appears to be an accretion of material to the bow and the stern.

174. The wreck is recorded by the UKHO under record 71600 and was first identified in 2007, through survey, as a small, degraded, intact wreck measuring 34.0 m x 9.0 m. The identity of the wreck is unknown.

BBMB_SSS_2020_0373 (annexes C and D)

175. BBMB_SSS_2020_0373 lies towards the northern area of the Proposed Development array area and is the coherent remains of a small, wrecked vessel measuring 33.1 m x 10.8 m with the bow potentially lying to the southeast. The vessel does not appear broken, however there is potential evidence of collapse towards the stern. Scour is evident around the wreck, most prominent to the stern but also extending north-east and south-west.

176. The wreck is recorded by the UKHO under record 70467 and was first identified in 2007, through survey, as an upright, intact wreck measuring 41.3 m x 12.6 m. It is unclear where the difference in length originates as there is no evidence of collapsed or buried wreckage past the extents of that identified during this assessment. The identity of the wreck is unknown.

BBMB_MBES_2020_0002 (annexes C and D)

177. BBMB_MBES_2020_0002 lies within the west area of the Proposed Development array area and is the prominent remains of a wrecked vessel measuring 60.5 m x 10.4 m and with a measurable height of 3.4 m. The wreck appears largely intact and is highly likely to be inverted, scour is evident along all sides although it is less prominent to the north. There is little evidence of any outlying debris. The form of the vessel, including size and current condition, indicates metal construction.

178. The wreck is recorded by the UKHO under record 70469 and was first identified in 2007, through survey, as an intact wreck measuring 73.8 m x 14.0 m. No further information regarding origin or identity is available.

BBMB_SSS_2020_0360 (annexes C and D)

179. BBMB_SSS_2020_0360 lies towards the centre of the Proposed Development array area and is the very broken up remains of a wrecked vessel measuring 48.1 m x 14.2 m and associated with a significant magnetic anomaly of 13,071.7 nT. The wreck is in two main sections orientated north, south with the most prominent remains to the south. A further smaller section lies to the south. Debris extents around the wreck but is largely confined to the footprint of the site. Scour is visible around the site and the form of the wreck, alongside the magnetic anomaly, indicates metal construction.

180. The wreck is recorded by the UKHO under record 70464 and was first identified in 2007, through survey, as a highly degraded site measuring 44.8 m x 19.2 m. The identity of the wreck is unknown.

BBMB_SSS_2020_0189 (annexes C and D)

181. BBMB_SSS_2020_0189 lies on the south-western boundary of the Proposed Development array area and is the potential remains of a wrecked vessel measuring 36.2 m x 19.1 m. The form of the anomaly is vessel like in shape and comprises a distinct area of potential anthropogenic debris characterised by multiple features many of which are linear in form. The wreck is low lying with a maximum height of 1.0 m and very broken up, scour is evident around all sides, however it is more prominent to the north.

182. The wreck is not recorded by the UKHO but could potentially be one of the unverified wrecks recorded on the NRHE (Figure 4.4).

Medium potential anomalies

183. The distribution of medium potential anomalies across the Proposed Development array area is shown in Figure 4.6 with further details in annex E. Unlike the high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. wrecks) medium potential anomalies represent objects or sites of likely anthropogenic origin that require further investigation in order to fully clarify their nature and establish their archaeological potential.

184. There are 20 medium potential anomalies within the Proposed Development array area. Further investigation will be required in order to establish the identity and archaeological significance of these once the final design of Proposed Development is finalised and the potential for direct interaction with these anomalies confirmed.

Magnetic anomalies

185. A total of 37 large (>100 nT) magnetic anomalies with no obvious corresponding contact are located within the Proposed Development array area. Their locations are shown in Figure 4.7 with further details in annex F.

Recorded wrecks/Obstructions not identified by geophysical survey

186. A total of six UKHO records from within the Proposed Development array area were not identified by geophysical survey (UKHO 3155 Benbow, UKHO 3153 Rudolph, UKHO 3154, UKHO 3157, UKHO 3159, UKHO 3173 Desabla). All of these records relate to wrecks now considered Dead by the UKHO. The marking of a record as Dead means it is no longer detected by repeated surveys and is therefore considered not to exist. It can therefore be assumed that the wreck no longer exists at the given position. Where records relate to a reported sinking there remains the possibility that the wreck lies within the wider area as with the Desabla which was identified as lying on its port side in 2010 during a diver survey but was not identified during the recent survey suggesting it could be currently buried by sediment.

187. In addition, it is possible that some of the unverified wrecks recorded by the NRHE could relate to the Medium Potential Anomalies or the Magnetic Anomalies identified during the survey (Figure 4.8).

4.5.2. PROPOSED DEVELOPMENT EXPORT CABLE CORRIDOR

High potential anomalies

188. There are no anomalies of high potential identified within the Proposed Development export cable corridor (although the survey did not cover the full extent of the Proposed Development export cable corridor).

Medium potential anomalies

189. The distribution of medium potential anomalies across the Proposed Development export cable corridor is shown in Figure 4.6 with further details in annex E. Unlike the high potential anomalies which comprise clearly recognisable anthropogenic objects (e.g. wrecks) medium potential anomalies represent objects or sites of likely anthropogenic origin that require further investigation in order to fully clarify their nature and establish their archaeological potential.

190. There are five medium potential anomalies within the Proposed Development export cable corridor. Further investigation will be required to establish the identity and archaeological significance of these once the final design of the Proposed Development is finalised and the potential for any direct interaction with these anomalies confirmed.

Magnetic anomalies

191. A total of 69 large (>100 nT) magnetic anomalies with no obvious corresponding contact are located within the Proposed Development export cable corridor. The locations of these are shown in Figure 4.7 with further details in annex F.

Recorded wrecks/Obstructions not identified by geophysical survey

192. An obstruction recorded as a rock in the UKHO records was not identified by geophysical survey (UKHO 3149) within the Proposed Development export cable corridor. This record is considered Dead by the UKHO. The marking of a record as Dead means it is no longer detected by repeated surveys and is therefore considered not to exist. It can therefore be assumed that the obstruction no longer exists at the given position.

193. In addition, eight wrecks recorded on the UKHO and located within the Proposed Development export cable corridor that were not identified by geophysical survey. As such, the positions of these wrecks have not as yet been verified and must be assumed at this stage (UKHO 2873, UKHO 2884; UKHO 2890; UKHO 2892; UKHO2904 Craddock; UKHO 3101; UKHO 63948 UKHO 2875 Sharon Vale). In addition, it is possible that some of the unverified wrecks recorded by the NRHE relate to the Medium Potential Anomalies or the Magnetic Anomalies identified during the survey (Figure 4.8).

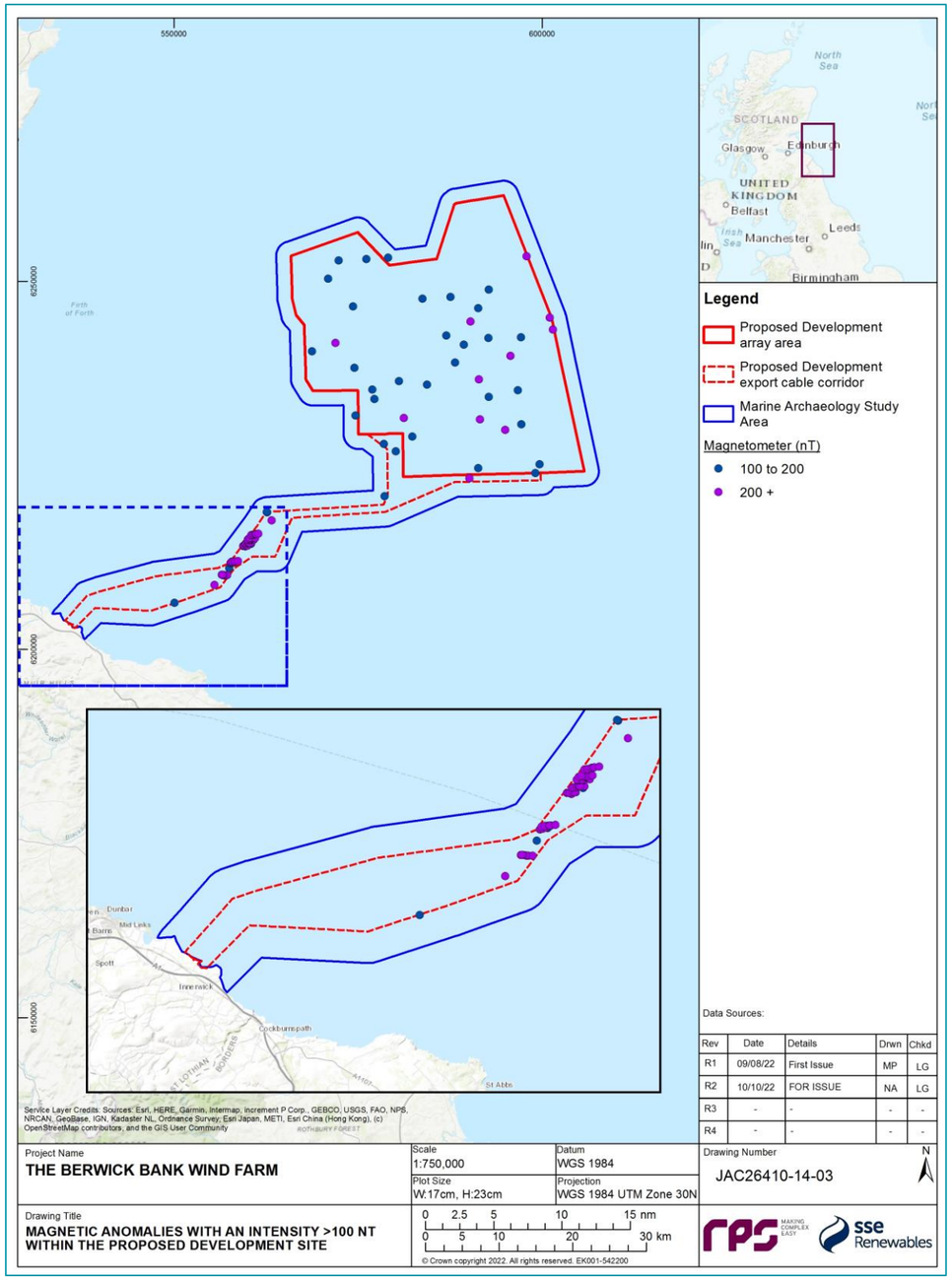

Figure 4.7 Magnetic Anomalies with an Intensity >100 nT within the Limits of the Proposed Development

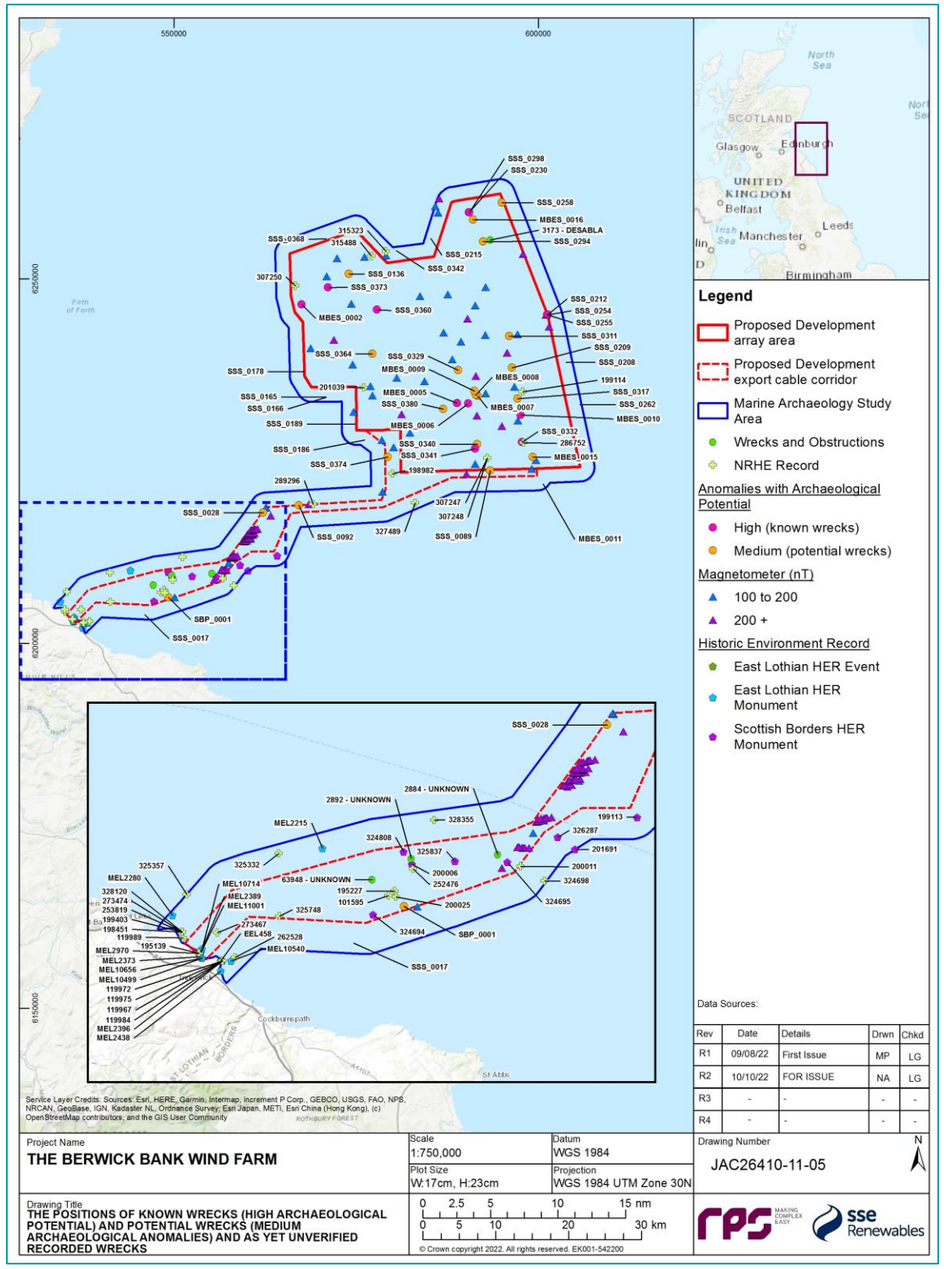

Figure 4.8: Positions of Known and Potential Archaeological Anomalies and as yet Unverified Recorded Wrecks

5. CONCLUSIONS

5.1. SUBMERGED PREHISTORIC ARCHAEOLOGICAL POTENTIAL

194. The marine archaeology study area was submerged during the late glacial/early Holocene and prior to this it was covered in a succession of ice sheets. During periods of glaciation the marine archaeology study area would have been uninhabitable but during inter-glacial periods there is a potential for periglacial occupation at times when the seabed would have formed dry land. The zones of highest potential for the survival of archaeological material are likely to be those on the edges of channels and floodplains, where old ground surfaces and organic remains are most likely to survive. These deposits often lie beneath relatively thin layers of seafloor sediment and may be vulnerable to exposure.

195. However, based on the available evidence whilst potential palaeo-landscape features have been recorded within the Proposed Development boundary including palaeo-channels, incised valleys and relict glacial lakes, the proglacial environments in which they are likely to have been formed are not likely to have been attractive locations for human habitation. In other areas such features would have formed foci for human activity following climatic amelioration, however, sea level rises are likely to have submerged these features within the site relatively rapidly further demonstrating the limited archaeological potential of the area.

196. Consequently, it is considered unlikely that evidence of *in situ* Palaeolithic and Mesolithic activity will be found within the Proposed Development array area due to the effects of repeated glaciations, marine transgressions and associated fluvial activity. There is however some paleoenvironmental potential within the Aberdeen Ground Formation. Within the Proposed Development export cable corridor there is some potential for late Palaeolithic/Mesolithic deposits in the near shore area although due to the effects of erosion redeposited material is more likely than *in situ* evidence. In addition, the localised presence of peat buried in the Quaternary deposits could suggest a good palaeo-environmental potential and where these sediments are present there is a good potential for organic preservation of remains such as fish traps, associated with prehistoric exploitation of the coastal margins. Future archaeological assessment of the results of pre-construction geotechnical investigations within the Proposed Development site will provide further information on the presence or absence of peat and the palaeo-environmental and archaeological potential of this area.

5.2. MARITIME ARCHAEOLOGICAL POTENTIAL

197. The North Sea has been identified as a region with historically high levels of shipping and military aviation activity and vessel/aircraft loss. The survival of ship and aircraft wrecks depends on a range of factors, including the age and construction material of any wreck.

198. No designated wrecks are recorded within the marine archaeology study area, although one known wreck (U 12) lies within the west of the marine archaeology study area. The wreck is considered a war grave and so will fall within the protection of the Protection of Military Remains Act.

199. A total of eleven wrecks have been recorded by the site-specific geophysical survey within the Proposed Development array area, one of which is known; Kitty. Of the remaining ten wrecks, nine are also recorded as UKHO data. The remaining wrecks may represent one of the wrecks recorded on the NRHE as potentially lying within the Proposed Development array area (although none of the positions have been verified). In addition, six wrecks included within the UKHO data were not identified during the survey and their positions have been recorded as ‘Dead’ (although one wreck recorded as ‘dead’ (Desabla) was recorded during a diver survey in 2010).

200. No wrecks were recorded within the Proposed Development export cable corridor during the site-specific geophysical survey (although the survey did not cover the full extent of the Proposed Development export

cable corridor). There are eight wrecks recorded on the UKHO located within the Proposed Development export cable corridor that fall outside the GSA and so their positions have not as yet been verified and so must be assumed at this stage (UKHO 2873, UKHO 2884; UKHO 2890; UKHO 2892; UKHO2904 Cradock; UKHO 3101; UKHO 63948, UKHO 2875 Sharon Vale).

201. In addition, 25 unconfirmed anomalies identified as being of medium archaeological potential and 106 large magnetic anomalies of archaeological potential were recorded within the Proposed Development site. Some of these anomalies may be associated with wrecks recorded on the UKHO, NRHE, Scottish Borders or East Lothian HER that have no known position, or they could represent anomalies of as yet unknown archaeological interest.

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

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

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

205. There is therefore a generally moderate to good potential for unexpected remains to be discovered within the marine archaeology study area.

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7. CONFIDENTIAL ANNEXES

7.1. CONFIDENTIAL ANNEX A: GAZETTEER OF UKHO DATA WITHIN THE MARINE ARCHAEOLOGY STUDY AREA

Table 7.1: Gazetteer of UKHO Data within the Proposed Development Export Cable Corridor and 2 km Buffer

UKHO Identifier	Description	UKHo State	Name	Latitude	Longitude	Depth Surveyed	UKHo Comments
63950	Wreck	LIVE	CAPTAIN	56.04611667	-2.117116667	62	INTACT, UPRIGHT SLIGHT LIST TO STARBOARD
2904	Wreck	DEAD	CRADOCK	56.08328333	-2.001583333	37	
6395	Wrecl	LIVE	HALLAND (PROBABLY)	56.03106667	-2.31545	52	UPRIGHT, HOLDS VISIBLE ON DCS3, ?ONLY PART OF VESSEL
2889	Geological	DEAD	Obstruction	56.03328333	-2.051583333		
2898	Geological	DEAD	Obstruction	56.06661667	-2.06825		
3149	Geological	DEAD	Obstruction	56.11133333	-1.8555		
4234	Wreck	LIVE	RIVER GARRY	55.99688333	-2.4193		WELL BROKEN UP
2875	Wreck	DEAD	SHARON VALE	56.00828333	-2.218216667	45	
63944	Wreck	LIVE	UNKNOWN	55.9821	-2.210666667	53	INTACT
4229	Wreck	DEAD	UNKNOWN	55.99495	-2.441533333		
2873	Wreck	DEAD	UNKNOWN	55.99995	-2.234883333		
3102	Wreck	DEAD	UNKNOWN	56.00106667	-2.16545		
3101	Wreck	DEAD	UNKNOWN	56.00495	-2.226		
2892	Wreck	LIVE	UNKNOWN	56.02673333	-2.202266667	52	UPRIGHT, INTACT, BOWS S
2884	Wreck	LIVE	UNKNOWN	56.02843333	-2.113283333	61	INTACT, PROBABLY COLLAPSED
2890	Wreck	DEAD	UNKNOWN	56.03328333	-2.201566667		
65620	Wreck	LIVE	UNKNOWN	56.12576667	-1.514683333	57	INTACT, ?BOWS SW
3152	Wreck	DEAD	TIZONA	56.19438333	-1.751633333	35	
63952	Wreck	LIVE	UNKNOWN	56.13065	-1.380366667	44	SMALL, INTACT, UPRIGHT, BOWS ?ENE

Table 7.2: Gazetteer of UKHO Data within the Proposed Development Array Area and 2 km Buffer

UKHo_Identifier	Description	UKHo_state	Name	Latitude	Longitude	Depth Surveyed	UKHo _Comments
3155	Wreck	DEAD	BENBOW	56.35963333	-1.659983333		
3173	Wreck	DEAD	DESABLA	56.43323333	-1.485016667		
3151	Wreck	LIVE	KITTY (POSSIBLY)	56.17651667	-1.52825	50	UPRIGHT, INTACT, BOWS S
70438	Wreck	LIVE	OSWIN (PROBABLY)	56.33963333	-1.361183333	51	DEGRADED, COLLAPSED AT NE END, BOWS NE
3153	Wreck	DEAD	RUDOLPH	56.24993333	-1.39335	35	
3152	Wreck	DEAD	TIZONA	56.19438333	-1.751633333	35	
70468	Wreck	LIVE	U 12	56.24363333	-1.857033333	39	INTACT, ?MAST STANDS 2MTRS
63952	Wreck	LIVE	UNKNOWN	56.13065	-1.380366667	44	SMALL, INTACT, UPRIGHT, BOWS ?ENE
71600	Wreck	LIVE	UNKNOWN	56.18345	-1.42485	54	UPRIGHT, DEGRADED, SCOUR SURROUNDS WK, BOWS E
70439	Wreck	LIVE	UNKNOWN	56.21658333	-1.426	57	UPRIGHT, INTACT, HOLD VISIBLE ON DCS3, SCOUR AROUND WK
70457	Wreck	LIVE	UNKNOWN	56.23213333	-1.542166667	52	INTACT, BOWS E, LISTS TO PORT
70460	Wreck	LIVE	UNKNOWN	56.23263333	-1.566383333	48	HIGHLY DEGRADED WK, MINOR SCOUR EXTENDS E & W
3154	Wreck	DEAD	UNKNOWN	56.32491667	-1.609983333		
70464	Wreck	LIVE	UNKNOWN	56.34976667	-1.740083333	48	HIGHLY DEGRADED, SCOUR EXTENDS S & W
70469	Wreck	LIVE	UNKNOWN	56.35778333	-1.906716667	35	INTACT, POSSIBLY INVERTED, SCOUR TO E & W
3157	Wreck	DEAD	UNKNOWN	56.37491667	-1.535		
70467	Wreck	LIVE	UNKNOWN	56.37831667	-1.847716667	52	INTACT, UPRIGHT, MINOR SCOUR AT BOTH ENDS OF WK
70463	Wreck	LIVE	UNKNOWN	56.42236667	-1.694333333	43	BROKEN, DEGRADED WK, BOWS SW, IN AREA OF SCOUR
3159	Wreck	DEAD	UNKNOWN	56.4499	-1.585		
70456	Wreck	LIVE	UNKNOWN	56.46751667	-1.531	48	UPRIGHT, BROKEN INTO THREE SECTIONS

7.2. CONFIDENTIAL ANNEX B: GAZETTEER OR NHRE DATA WITHIN THE MARINE ARCHAEOLOGY STUDY AREA

Table 7.3: Gazetteer of NHRE Data within the Marine Archaeology Study Area

Numlink	Location	Nmrsname	Period	Classsub	Altname
198982	Array	ROYAL ALBERT: NORTH SEA	19TH CENTURY	STEAM TUG (19TH CENTURY)	'20 MILES NEXE OF ST ABBS HEAD', ROYAL ALBERT
199114	Array	MARY ELIZABETH: NORTH SEA	19TH CENTURY	SCHOONER (19TH CENTURY)	ISLE OF MAY, '35 MILES EAST OF MAY ISLAND', MARY ELIZABETH
201039	Array	ACHILLES: NORTH SEA	20TH CENTURY	STEAM TRAWLER (20TH CENTURY)	GN 38, ISLE OF MAY, '26 MILES EAST OF MAY ISLAND', ACHILLES (GN 38)
286752	Array	MARY ANN: NORTH SEA	19TH CENTURY	SCHOONER (19TH CENTURY)	'ABOUT 35 MILES E 1/2 S OF MAY ISLAND', ISLE OF MAY, OUTER FORTH ESTUARY, MARY ANN
307247	Array	GENTIANA: NORTH SEA	19TH CENTURY	STEAM DRIFTER (20TH CENTURY)	BCK 30, 'THIRTY FOUR MILES EAST BY NORTH OF MAY ISLAND', ISLE OF MAY, GENTIANA (BCK 30)
307248	Array	OSCAR (POSSIBLY): NORTH SEA	19TH CENTURY	CRAFT (19TH CENTURY)	'THIRTY MILES EAST BY SOUTH OF MAY ISLAND', ISLE OF MAY, UNKNOWN 1856
307250	Array	ROSEHAUGH: NORTH SEA	19TH CENTURY	MOTOR VESSEL (20TH CENTURY)	'45 MILES N1/2W OF [THE] FARNE ISLANDS', ROSEHAUGH
315323	Array	ENNISKILLAN: NORTH SEA	19TH CENTURY	STEAMSHIP (20TH CENTURY)	'22 MILES EXS OF [THE] BELL ROCK', ENNISKILLAN
315448	Array	MCDONNELL DOUGLAS F-4 PHANTOM II FG1: NORTH SEA	20TH CENTURY	AIRCRAFT (20TH CENTURY)	XR769, '28 NM EAST OF LEUCHARS', A/C PHANTOM
324096	Array	UNKNOWN		OBSTRUCTION (POSSIBLE)	
101595	Cable corridor	UNKNOWN: NORTH SEA		OBSTRUCTION	FAST CASTLE HEAD, FIRTH OF FORTH, OUTER FORTH ESTUARY
119967	Cable corridor	ANDROMEDA: LONG CRAIG, TORNESS POINT, FIRTH OF FORTH	20TH CENTURY	SCHOONER (20TH CENTURY)	THE REEF, LONGCRAIG ROCKS, LONG CRAIG ROCK, COCKBURNSPATH, THORNTONLOCH, OUTER FORTH ESTUARY, ANDROMEDA
119972	Cable corridor	KING JA: LONG CRAIG, TORNESS POINT, FIRTH OF FORTH	20TH CENTURY	STEAMSHIP (20TH CENTURY)	KING JAJA, COCKBURNSPATH,THORNTONLOCH, LONGCRAIG, OUTER FORTH ESTUARY
119975	Cable corridor	AGNES: LONG CRAIG, TORNESS POINT, FIRTH OF FORTH	19TH CENTURY	BRIG (19TH CENTURY)	LONGCRAIG REEF, LONGDRAIG ROCKS, COCKBURNSPATH, THORNTONLOCH, OUTER FORTH ESTUARY, AGNES
119984	Cable corridor	PROSUM: LONG CRAIG, TORNESS POINT, FIRTH OF FORTH	20TH CENTURY	STEAMSHIP (20TH CENTURY)	BERGAMO, LONGCRAIG ROCKS, THORNTONLOCH, COCKBURNSPATH, BATHE REEF, OUTER FORTH ESTUARY, PROSUM (EX. BERGAMO)
119989	Cable corridor	ECCLEFECHAN: BARNS NESS, FIRTH OF FORTH	20TH CENTURY	BARQUE (20TH CENTURY)	SKATERAW ROCKS, SKATERAW HARBOUR, SKATE RAW, '0.5 MILE NE OF BARNS NESS', OUTER FORTH ESTUARY, ECCLEFECHAN
195139	Cable corridor	NYMPHE [POSSIBLY]: CHAPEL POINT, SKATERAW HARBOUR, FIRTH OF FORTH	19TH CENTURY	FIFTH RATE WARSHIP (19TH CENTURY)	HMS NYMPH, LA NYMPHE, OUTER FORTH ESTUARY, HMS NYMPHE (EX. LA NYMPHE)
195227	Cable corridor	UNKNOWN: NORTH SEA		CRAFT	FAST CASTLE, FIRTH OF FORTH, OUTER FORTH ESTUARY
198451	Cable corridor	CLAN ALPINE: GOATNESS POINT, DUNBAR, FIRTH OF FORTH	19TH CENTURY	STEAMSHIP (19TH CENTURY)	GOAT NESS, OUTER FORTH ESTUARY, CLAN ALPINE
199403	Cable corridor	BETA: GOAT'S POINT, DUNBAR, FIRTH OF FORTH	19TH CENTURY	STEAMSHIP (19TH CENTURY)	OUTER FORTH ESTUARY, BETA
200011	Cable corridor	UNKNOWN: NORTH SEA	20TH CENTURY	STEAMSHIP (20TH CENTURY)	ST ABB'S HEAD, OUTER FORTH ESTUARY
200025	Cable corridor	UNKNOWN: NORTH SEA	20TH CENTURY	STEAMSHIP (20TH CENTURY)	ST ABBS HEAD, FIRTH OF FORTH, OUTER FORTH ESTUARY
246913	Cable corridor	AGENORIA: DUNBAR, FIRTH OF FORTH	19TH CENTURY	BRIG (19TH CENTURY)	AGENARIA, COVE, ST ABB'S HEAD, OUTER FORTH ESTUARY, AGENORIA
246918	Cable corridor	JOHNS: DUNBAR, FIRTH OF FORTH	19TH CENTURY	CRAFT (19TH CENTURY)	'NEAR DUNBAR', COVE, OUTER FORTH ESTUARY, JOHNS
252476	Cable corridor	ONWARD: FIRTH OF FORTH	19TH CENTURY	CRAFT (19TH CENTURY)	LH 1069, DUNBAR, OUTER FORTH ESTUARY, NORTH SEA, ONWARD (LH 1069)
253819	Cable corridor	WAVE: GOATNESS POINT, DUNBAR, FIRTH OF FORTH	19TH CENTURY	SCHOONER (19TH CENTURY)	OUTER FORTH ESTUARY, 'GOATNESS POINT, HADDINGTONSHIRE', WAVE
262528	Cable corridor	ELISE: NORTH SEA	19TH CENTURY	GALLIOT (19TH CENTURY)	'FIVE MILES SOUTH OF DUNBAR', LEITH, OUTER FORTH ESTUARY, ELISE
273467	Cable corridor	BRISTOL BEAUFIGHTER: BARNS NESS, FIRTH OF FORTH	20TH CENTURY	AIRCRAFT (20TH CENTURY)	JL 427, '1.5 MILES EXS OF BARNSNESS LIGHTHOUSE', BARNES NESS, OUTER FORTH ESTUARY, A/C BRISTOL
273474	Cable corridor	MARGARET: GOAT POINT, DUNBAR, FIRTH OF FORTH	19TH CENTURY	SCHOONER (19TH CENTURY)	GOATNESS, OUTER FORTH ESTUARY, MARGARET
289296	Cable corridor	SHORT TYPE 184 SEAPLANE: NORTH SEA	20TH CENTURY	AIRCRAFT (20TH CENTURY)	N1661, '15 MILES NE OF ST ABBS HEAD', A/C SHORT

7.3. CONFIDENTIAL ANNEX C: GAZETTEER OF POTENTIAL ARCHAEOLOGICAL ANOMALIES

Table 7.4: Gazetteer of Potential Archaeological Anomalies

Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_MBES_2020_0002	567551.6	6246444.9	High	60.5	10.4	3.4	null	Wreck	70469	Unknown
BBMB_MBES_2020_0005	588871.4	6232899.6	High	41.5	12.3	0.8	null	Wreck	70460	Unknown
BBMB_MBES_2020_0006	590388.3	6232872.8	High	28.5	8.5	3.0	null	Wreck	70457	Unknown
BBMB_MBES_2020_0010	597610.4	6231315.9	High	34.0	10.7	2.7	null	Wreck	70439	Unknown
BBMB_MBES_2020_0011	600671.7	6221809.5	High	29.8	8.8	1.5	12.8	Wreck	63952	Unknown
BBMB_SSS_2020_0165	570847.6	6233782.0	High	25.5	8.8	1.6	351.0	Wreck	70468	U12
BBMB_SSS_2020_0189	574835.5	6230067.7	High	36.2	19.1	1.0	null	Wreck	null	Unknown
BBMB_SSS_2020_0208	603842.4	6238540.1	High	44.5	23.4	0.6	null	Wreck	null	Unknown
BBMB_SSS_2020_0212	601282.4	6245056.7	High	91.6	37.7	6.1	1056.7	Wreck	70438	Oswin (probably)
BBMB_SSS_2020_0298	590519.6	6259051.7	High	76.2	19.7	3.8	59127.2	Wreck	70456	Unknown
BBMB_SSS_2020_0332	597770.1	6227609.8	High	35.6	8.6	2.3	null	Wreck	71600	Unknown
BBMB_SSS_2020_0341	591366.5	6226686.0	High	33.5	7.6	3.3	null	Wreck	3151	Kitty (possibly)
BBMB_SSS_2020_0342	580515.9	6253841.0	High	55.6	24.3	1.7	597.5	Wreck	70463	Unknown
BBMB_SSS_2020_0360	577863.1	6245712.0	High	48.1	14.2	2.3	13071.7	Wreck	70464	Unknown
BBMB_SSS_2020_0373	571145.9	6248792.9	High	33.1	10.8	8.7	null	Wreck	70467	Unknown
BBMB_MBES_2020_0007	591704.6	6233921.9	Medium	32.6	6.6	1.1	null	Unidentified debris	null	null
BBMB_MBES_2020_0008	591460.0	6234080.5	Medium	44.9	23.3	1.2	null	Unidentified debris	null	null
BBMB_MBES_2020_0009	591260.0	6234573.3	Medium	25.3	4.5	0.9	null	Unidentified debris	null	null
BBMB_SBP_2020_0001	549261.0	6206294.0	Medium	null	null	null	null	Unidentified anomaly	null	null
BBMB_SSS_2020_0017	546020.1	6203927.9	Medium	8.3	3.1	0.9	null	Unidentified debris	null	null
BBMB_SSS_2020_0028	562254.0	6217904.9	Medium	5.6	1.6	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0089	593403.5	6223700.3	Medium	6.1	4.7	0.3	null	Seabed disturbance	null	null
BBMB_SSS_2020_0092	567172.9	6218924.3	Medium	11.0	3.3	0.9	null	Unidentified debris	null	null
BBMB_SSS_2020_0136	573999.2	6250628.2	Medium	13.4	9.0	0.3	null	Unidentified debris	null	null
BBMB_SSS_2020_0149	560759.7	6252272.4	Medium	4.0	3.3	1.0	null	Unidentified debris	null	null
BBMB_SSS_2020_0151	560344.1	6251269.1	Medium	9.7	5.0	0.1	null	Mound	null	null
BBMB_SSS_2020_0152	559973.8	6249854.5	Medium	10.9	3.0	0.6	null	Likely geological	null	null
BBMB_SSS_2020_0160	564187.1	6259751.9	Medium	16.6	5.9	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0166	570865.2	6233753.8	Medium	2.4	1.0	0.6	null	Wreck debris	null	null
BBMB_SSS_2020_0178	567819.5	6237262.4	Medium	34.5	3.6	0.2	44.9	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0186	576164.2	6227895.8	Medium	18.0	6.9	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0209	596419.7	6237798.6	Medium	7.8	4.1	0.6	null	Likely geological	null	null
BBMB_SSS_2020_0215	585257.5	6255503.4	Medium	7.1	1.1	0.7	null	Unidentified debris	null	null
BBMB_SSS_2020_0230	590472.5	6259083.4	Medium	1.1	0.6	0.1	null	Wreck debris	null	null
BBMB_SSS_2020_0254	601207.6	6245031.1	Medium	11.8	7.1	1.3	288.9	Wreck debris	null	null
BBMB_SSS_2020_0255	601307.1	6244996.6	Medium	1.7	1.7	0.3	null	Wreck debris	null	null
BBMB_SSS_2020_0258	595006.5	6260421.3	Medium	38.1	2.7	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0262	605718.3	6232734.4	Medium	10.1	5.5	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0294	592454.3	6255077.3	Medium	12.2	8.0	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0311	595997.4	6242134.5	Medium	5.9	3.2	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0317	597156.8	6233525.5	Medium	16.1	8.2	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0329	589027.1	6237440.2	Medium	14.7	12.3	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0340	591642.8	6227315.5	Medium	31.2	13.2	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0364	577231.7	6239666.5	Medium	23.8	3.3	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0368	570872.7	6255445.0	Medium	16.7	8.1	1.1	null	Mound	null	null
BBMB_SSS_2020_0374	579361.4	6225549.2	Medium	140.8	36.3	0.8	88.2	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0380	586970.2	6232104.8	Medium	7.5	3.4	0.3	null	Seabed disturbance	null	null
BBMB_MBES_2020_0015	599253.7	6225536.9	Medium	20.9	16.3	1.2	null	Mound	null	null
BBMB_MBES_2020_0016	591068.8	6258079.9	Medium	103.2	30.9	1.1	null	Likely geological	null	null

Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_SSS_2020_0382	590162.3	6223011.7	Low	1.9	1.1	0.3	306.9	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0383	590228.9	6223015.2	Low	1.1	0.7	0.2	306.9	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0384	602721.2	6229557.7	Low	null	null	null	257.3	Unidentified debris with magnetic anomaly	null	null
BBMB_MBES_2020_0013	561798.5	6253905.2	Low	13.0	13.0	1.2	null	Mound	null	null
BBMB_MBES_2020_0014	569302.3	6264450.4	Low	10.0	10.0	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0001	557848.8	6210895.7	Low	3.3	0.9	0.4	null	Likely geological	null	null
BBMB_SSS_2020_0002	546018.1	6204258.7	Low	4.1	2.8	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0003	542027.5	6201948.8	Low	3.2	1.6	0.9	null	Likely geological	null	null
BBMB_SSS_2020_0004	543883.0	6203012.1	Low	23.9	0.6	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0005	543929.4	6202953.3	Low	5.7	0.7	0.4	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0006	546216.0	6204341.9	Low	2.9	0.0	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0007	543803.5	6203113.5	Low	1.8	2.4	0.9	null	Likely geological	null	null
BBMB_SSS_2020_0008	545670.2	6204234.7	Low	2.2	0.5	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0009	552635.9	6207939.2	Low	12.5	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0010	562860.1	6216942.3	Low	3.9	3.3	0.6	null	Potential debris	null	null
BBMB_SSS_2020_0011	542500.5	6201757.1	Low	2.4	0.6	0.6	null	Likely geological	null	null
BBMB_SSS_2020_0012	552673.8	6207711.0	Low	3.6	3.8	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0013	552258.8	6207556.0	Low	2.6	0.7	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0014	551688.1	6207343.3	Low	3.0	5.6	0.2	null	Seabed disturbance	null	null
BBMB_SSS_2020_0015	550899.6	6206991.5	Low	4.4	3.2	0.2	null	Seabed disturbance	null	null
BBMB_SSS_2020_0016	546425.6	6204429.1	Low	2.2	1.0	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0018	546064.0	6203869.9	Low	2.7	1.4	0.4	null	Likely geological	null	null
BBMB_SSS_2020_0019	556594.2	6208906.8	Low	7.2	4.8	0.2	null	Seabed disturbance	null	null
BBMB_SSS_2020_0020	545823.6	6203858.6	Low	2.2	1.2	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0021	545817.5	6203861.9	Low	1.9	0.5	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0022	557814.3	6210260.1	Low	1.5	0.9	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0023	557942.0	6210173.3	Low	2.2	0.4	0.0	null	Potential debris	null	null
BBMB_SSS_2020_0024	543718.7	6202778.1	Low	3.6	2.4	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0029	577061.1	6226219.5	Low	2.6	0.2	0.1	null	Linear feature	null	null
BBMB_SSS_2020_0031	565635.9	6219503.4	Low	9.6	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0032	565635.7	6219494.8	Low	1.3	0.8	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0036	577124.9	6226029.7	Low	5.1	2.6	0.8	null	Likely geological	null	null
BBMB_SSS_2020_0045	564722.3	6218810.2	Low	2.9	0.4	0.8	null	Potential debris	null	null
BBMB_SSS_2020_0046	565803.3	6219560.8	Low	4.2	2.5	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0048	576437.0	6225746.6	Low	2.3	0.0	1.1	null	Potential debris	null	null
BBMB_SSS_2020_0049	568555.5	6220887.7	Low	1.3	0.5	0.3	null	Anchor	null	null
BBMB_SSS_2020_0050	568537.1	6220884.8	Low	19.0	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0052	578417.7	6226460.5	Low	2.6	3.7	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0054	564853.7	6218634.5	Low	2.7	1.9	0.3	null	Likely geological	null	null
BBMB_SSS_2020_0055	561394.7	6216772.1	Low	8.9	0.2	0.1	null	Linear feature	null	null
BBMB_SSS_2020_0057	577740.7	6226010.0	Low	2.2	2.1	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0058	560499.9	6215021.4	Low	6.9	3.4	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0059	560696.1	6215037.6	Low	5.5	4.6	0.3	null	Seabed disturbance	null	null
BBMB_SSS_2020_0060	560737.9	6215053.8	Low	5.3	4.7	0.5	null	Seabed disturbance	null	null
BBMB_SSS_2020_0061	599231.9	6223500.8	Low	5.8	4.5	0.1	null	Mound	null	null
BBMB_SSS_2020_0062	579546.1	6219554.1	Low	3.1	1.9	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0063	578038.3	6219142.0	Low	1.7	0.4	0.7	null	Potential debris	null	null
BBMB_SSS_2020_0064	567391.7	6218319.4	Low	2.3	1.1	0.7	null	Unidentified debris	null	null
BBMB_SSS_2020_0065	569530.8	6218467.3	Low	9.8	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0066	578497.0	6219062.1	Low	3.1	1.7	0.2	null	Anchor	null	null
BBMB_SSS_2020_0067	597487.8	6223337.0	Low	3.5	2.3	1.7	null	Likely geological	null	null
BBMB_SSS_2020_0068	586101.3	6222131.8	Low	1.7	0.9	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0069	581860.4	6220359.4	Low	4.6	4.0	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0070	573667.9	6218661.9	Low	3.6	0.3	0.1	null	Linear feature	null	null

Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_SSS_2020_0071	576233.8	6218643.6	Low	2.3	0.9	0.9	null	Potential debris	null	null
BBMB_SSS_2020_0072	583872.1	6221162.5	Low	3.6	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0074	597139.6	6222879.2	Low	3.7	0.7	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0075	581383.8	6219885.6	Low	4.5	1.2	0.0	null	Potential debris	null	null
BBMB_SSS_2020_0076	588404.9	6222720.1	Low	1.0	0.6	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0077	591003.7	6222866.4	Low	5.0	1.5	0.7	null	Likely geological	null	null
BBMB_SSS_2020_0078	593051.1	6222849.7	Low	2.9	0.3	0.3	null	Linear feature	null	null
BBMB_SSS_2020_0080	564339.5	6219458.8	Low	3.4	0.4	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0081	567168.5	6220745.3	Low	2.2	0.4	0.9	null	Potential debris	null	null
BBMB_SSS_2020_0082	563845.0	6218787.3	Low	5.6	1.0	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0083	564407.2	6219097.5	Low	4.9	3.8	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0084	582352.5	6221286.7	Low	2.9	2.4	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0085	591995.2	6223796.9	Low	3.4	2.5	0.6	null	Potential debris	null	null
BBMB_SSS_2020_0086	584552.8	6222542.0	Low	4.9	6.3	0.9	null	Likely geological	null	null
BBMB_SSS_2020_0087	585865.6	6226322.0	Low	4.3	2.0	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0088	587313.5	6225788.3	Low	6.6	3.3	1.0	null	Mound	null	null
BBMB_SSS_2020_0090	590111.9	6223688.8	Low	2.1	0.4	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0091	586818.4	6223167.7	Low	31.4	10.8	1.7	null	Likely geological	null	null
BBMB_SSS_2020_0093	567919.6	6218845.4	Low	4.6	0.3	0.2	null	Linear feature	null	null
BBMB_SSS_2020_0094	593225.4	6223600.4	Low	5.5	0.2	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0095	575410.7	6219239.4	Low	3.9	4.0	0.8	null	Unidentified debris	null	null
BBMB_SSS_2020_0096	566981.5	6218669.9	Low	3.4	1.1	0.4	null	Likely geological	null	null
BBMB_SSS_2020_0097	570238.2	6218817.9	Low	6.7	4.3	1.7	null	Likely geological	null	null
BBMB_SSS_2020_0098	593018.0	6223497.6	Low	3.8	1.2	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0099	598290.5	6223600.3	Low	2.1	0.5	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0100	598665.8	6223579.7	Low	3.4	2.4	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0101	568893.4	6218554.2	Low	8.9	0.2	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0102	599361.7	6223496.1	Low	1.8	3.6	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0103	582470.5	6243206.8	Low	2.4	2.5	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0104	575833.5	6240683.7	Low	7.8	0.9	0.3	null	Unidentified debris	null	null
BBMB_SSS_2020_0105	566627.1	6239221.8	Low	1.9	2.2	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0106	584576.9	6246120.9	Low	3.8	0.6	0.6	null	Linear feature	null	null
BBMB_SSS_2020_0107	577044.7	6242160.3	Low	3.3	0.4	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0108	581158.2	6246889.7	Low	5.7	3.9	0.2	null	Mound	null	null
BBMB_SSS_2020_0110	577810.9	6245607.1	Low	6.4	3.8	0.2	null	Wreck debris	null	null
BBMB_SSS_2020_0111	577285.7	6245430.1	Low	3.2	2.4	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0112	576306.9	6245092.1	Low	5.4	6.6	0.8	null	Likely geological	null	null
BBMB_SSS_2020_0113	570940.8	6235478.6	Low	4.8	1.2	0.6	null	Potential debris	null	null
BBMB_SSS_2020_0114	585363.4	6242138.5	Low	7.0	2.0	0.9	null	Potential debris	null	null
BBMB_SSS_2020_0115	583723.1	6233999.4	Low	4.4	1.2	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0116	577731.2	6233815.3	Low	1.2	0.2	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0117	582916.9	6235859.8	Low	4.5	0.2	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0118	582922.6	6235872.8	Low	3.6	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0119	583157.4	6235872.8	Low	4.7	1.5	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0120	585602.4	6235801.2	Low	5.9	25.8	2.3	null	Fishing gear	null	null
BBMB_SSS_2020_0121	581667.1	6236474.6	Low	13.0	0.3	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0122	576174.8	6227958.0	Low	5.5	4.9	0.1	null	Seabed disturbance	null	null
BBMB_SSS_2020_0123	571676.6	6256172.4	Low	4.0	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0124	579803.2	6259329.6	Low	5.5	0.8	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0125	563327.6	6251887.4	Low	20.0	1.4	0.0	null	Fishing gear	null	null
BBMB_SSS_2020_0126	573905.4	6258038.0	Low	3.7	2.2	1.1	null	Potential debris	null	null
BBMB_SSS_2020_0127	560294.9	6252887.0	Low	6.7	0.3	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0128	577905.2	6258547.3	Low	11.3	0.3	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0129	578561.0	6253417.8	Low	7.2	1.8	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0130	578457.6	6253369.1	Low	5.0	0.7	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0131	567855.7	6251457.6	Low	4.0	2.6	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0132	567047.4	6251141.1	Low	11.0	2.7	0.0	null	Unidentified debris	null	null

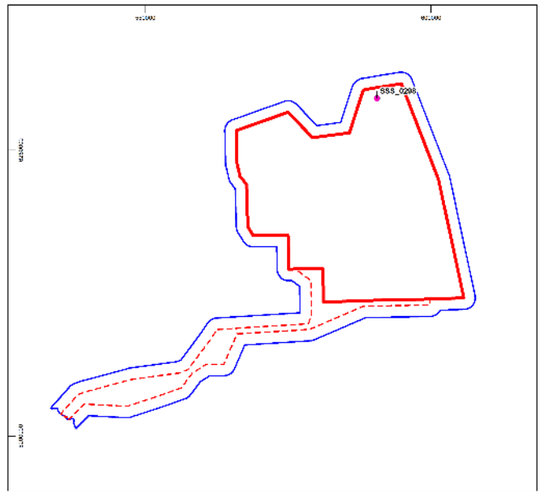
Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_SSS_2020_0137	576848.1	6251697.5	Low	5.8	2.6	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0140	564334.2	6244828.3	Low	2.7	1.5	0.0	null	Seabed disturbance	null	null
BBMB_SSS_2020_0141	581828.3	6251426.5	Low	7.1	0.5	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0142	583589.0	6247892.8	Low	7.3	2.4	0.0	null	Seabed disturbance	null	null
BBMB_SSS_2020_0143	583037.9	6249855.7	Low	2.9	2.8	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0144	572867.5	6244815.3	Low	2.3	1.9	0.8	null	Unidentified debris	null	null
BBMB_SSS_2020_0146	564199.5	6245679.8	Low	3.8	1.3	1.4	null	Potential debris	null	null
BBMB_SSS_2020_0147	562082.0	6249863.1	Low	3.3	0.9	0.8	null	Unidentified debris	null	null
BBMB_SSS_2020_0148	564229.9	6242665.7	Low	15.0	5.7	0.3	null	Unidentified debris	null	null
BBMB_SSS_2020_0153	575013.8	6262854.4	Low	7.7	4.6	0.1	null	Seabed disturbance	null	null
BBMB_SSS_2020_0154	575683.9	6264059.0	Low	4.4	4.6	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0157	574864.9	6264875.2	Low	10.4	7.7	0.3	null	Likely geological	null	null
BBMB_SSS_2020_0158	569190.5	6262746.9	Low	3.2	0.2	0.2	null	Linear feature	null	null
BBMB_SSS_2020_0159	562041.4	6260021.7	Low	6.2	5.2	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0162	569211.9	6255292.1	Low	4.9	0.1	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0163	569672.7	6238543.8	Low	5.0	0.5	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0164	564524.3	6251009.5	Low	3.4	2.2	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0169	569747.4	6234598.2	Low	8.7	11.4	0.1	null	Seabed disturbance	null	null
BBMB_SSS_2020_0170	569415.5	6235523.8	Low	15.8	9.3	0.2	null	Seabed disturbance	null	null
BBMB_SSS_2020_0171	562519.6	6253297.2	Low	1.2	0.7	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0172	562549.3	6251484.9	Low	1.9	0.6	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0173	562540.8	6251691.1	Low	2.0	2.2	0.4	null	Fishing gear	null	null
BBMB_SSS_2020_0174	560394.1	6257110.2	Low	13.3	2.5	0.3	null	Likely geological	null	null
BBMB_SSS_2020_0175	563342.0	6248364.0	Low	3.4	0.3	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0176	560625.0	6257010.2	Low	4.6	6.2	0.2	null	Mound	null	null
BBMB_SSS_2020_0177	563919.1	6247484.9	Low	4.4	0.4	0.3	null	Linear feature	null	null
BBMB_SSS_2020_0179	567819.5	6237262.4	Low	1.5	0.3	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0180	567806.8	6237262.5	Low	2.9	2.7	0.0	null	Potential debris	null	null
BBMB_SSS_2020_0181	568353.7	6235881.5	Low	15.7	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0182	560472.1	6253760.2	Low	8.9	1.0	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0183	574453.5	6232878.0	Low	3.5	0.4	0.3	null	Unidentified debris	null	null
BBMB_SSS_2020_0184	565037.0	6257278.2	Low	3.1	1.7	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0185	575658.4	6228502.3	Low	7.7	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0187	565044.8	6254585.6	Low	5.0	2.4	1.3	null	Likely geological	null	null
BBMB_SSS_2020_0188	572769.1	6234522.8	Low	6.6	0.6	0.2	null	Linear feature	null	null
BBMB_SSS_2020_0190	564754.8	6255826.0	Low	2.8	0.4	0.7	null	Unidentified debris	null	null
BBMB_SSS_2020_0192	563621.9	6257738.3	Low	4.7	3.0	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0193	570344.3	6238484.9	Low	4.0	1.0	0.0	null	Potential debris	null	null
BBMB_SSS_2020_0194	603710.9	6226706.5	Low	6.7	3.6	0.2	null	Fishing gear	null	null
BBMB_SSS_2020_0195	594937.4	6227536.5	Low	4.1	0.2	0.7	49.4	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0196	602372.4	6228339.1	Low	2.8	1.0	0.9	null	Anchor	null	null
BBMB_SSS_2020_0197	593787.9	6225059.4	Low	37.0	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0198	593522.8	6224882.3	Low	13.9	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0199	593475.8	6224939.6	Low	16.1	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0200	600518.9	6231855.1	Low	2.9	0.5	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0202	600177.7	6215628.0	Low	4.3	2.9	0.7	null	Likely geological	null	null
BBMB_SSS_2020_0205	574803.7	6232500.1	Low	5.5	1.3	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0206	597057.9	6253002.5	Low	28.4	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0207	597472.1	6255349.5	Low	5.5	0.0	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0210	593879.3	6236904.9	Low	39.8	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0211	587768.0	6237718.3	Low	3.5	0.8	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0216	587537.6	6249512.9	Low	8.0	0.4	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0217	590515.6	6241873.5	Low	8.4	6.0	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0218	592697.9	6236018.8	Low	5.0	3.8	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0219	595147.3	6229739.8	Low	3.2	0.5	0.3	85.8	Unidentified debris with magnetic anomaly	null	null

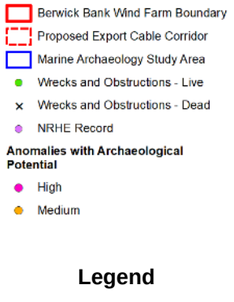
Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_SSS_2020_0220	595161.4	6229752.4	Low	1.8	1.1	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0226	591771.4	6254263.7	Low	6.5	0.2	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0227	592674.2	6259999.4	Low	13.2	0.3	0.1	null	Linear feature	null	null
BBMB_SSS_2020_0233	590214.9	6248736.6	Low	3.2	2.2	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0234	591338.8	6245852.6	Low	5.9	2.1	1.3	null	Potential debris	null	null
BBMB_SSS_2020_0235	597027.6	6230866.9	Low	5.5	0.3	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0236	585505.1	6259942.3	Low	2.7	0.9	1.5	null	Likely geological	null	null
BBMB_SSS_2020_0237	592940.2	6239416.1	Low	4.5	1.3	3.7	null	Likely geological	null	null
BBMB_SSS_2020_0238	596315.5	6229444.6	Low	3.4	1.6	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0239	595837.8	6230818.1	Low	4.7	7.8	0.1	null	Seabed disturbance	null	null
BBMB_SSS_2020_0240	588478.0	6249847.4	Low	5.5	1.0	0.2	null	Fishing gear	null	null
BBMB_SSS_2020_0241	587049.4	6251768.4	Low	1.4	1.4	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0242	597980.2	6234079.5	Low	2.5	1.0	0.6	null	Likely geological	null	null
BBMB_SSS_2020_0244	597402.6	6235079.9	Low	13.6	0.1	0.0	null	Anchor	null	null
BBMB_SSS_2020_0245	590523.9	6250109.3	Low	5.4	0.4	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0246	592629.3	6244838.8	Low	7.0	2.2	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0247	598280.5	6229884.5	Low	4.1	2.8	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0248	601421.5	6221714.3	Low	13.0	0.7	0.0	null	Linear feature	null	null
BBMB_SSS_2020_0251	595960.4	6258667.9	Low	35.7	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0252	596609.0	6256990.7	Low	1.4	0.9	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0256	603264.7	6239799.5	Low	2.3	0.4	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0257	606280.7	6231965.5	Low	4.7	3.0	1.7	null	Potential debris	null	null
BBMB_SSS_2020_0260	593477.3	6263268.6	Low	1.3	0.5	0.4	null	Potential debris	null	null
BBMB_SSS_2020_0261	595964.5	6255459.3	Low	42.1	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0263	599508.0	6247910.6	Low	14.1	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0264	604151.4	6232678.6	Low	6.1	2.8	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0265	596883.6	6251348.5	Low	50.1	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0266	605994.0	6228321.3	Low	4.8	1.5	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0267	596572.8	6252913.7	Low	4.0	0.5	0.4	null	Fishing gear	null	null
BBMB_SSS_2020_0268	607401.4	6223354.2	Low	21.4	0.4	0.1	null	Fishing gear	null	null
BBMB_SSS_2020_0269	602505.3	6236248.3	Low	7.5	1.7	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0270	605963.3	6226562.3	Low	4.9	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0271	605944.4	6226601.7	Low	48.8	27.4	0.0	null	Fishing gear	null	null
BBMB_SSS_2020_0272	601475.7	6240725.5	Low	13.7	0.0	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0273	600395.4	6243350.4	Low	3.7	0.1	0.0	null	Linear feature	null	null
BBMB_SSS_2020_0274	605866.8	6226507.0	Low	49.3	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0275	602158.4	6235936.4	Low	11.2	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0276	598022.5	6246842.5	Low	3.9	3.1	0.9	null	Likely geological	null	null
BBMB_SSS_2020_0277	604741.5	6225946.6	Low	56.8	0.3	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0278	601071.6	6235423.3	Low	15.5	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0279	601107.5	6235552.1	Low	43.7	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0283	604768.6	6228042.8	Low	5.0	0.1	0.0	null	Linear feature	null	null
BBMB_SSS_2020_0284	604566.5	6227584.7	Low	4.4	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0285	605112.9	6227895.1	Low	44.4	0.1	0.2	null	Fishing gear	null	null
BBMB_SSS_2020_0286	591736.2	6260482.4	Low	3.9	0.3	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0287	597823.8	6242884.7	Low	9.3	0.3	0.7	null	Likely geological	null	null
BBMB_SSS_2020_0288	594587.0	6250110.5	Low	12.8	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0289	590136.9	6260757.3	Low	3.4	2.2	0.2	null	Potential debris	null	null
BBMB_SSS_2020_0291	601565.2	6231016.7	Low	7.4	1.2	0.4	null	Likely geological	null	null
BBMB_SSS_2020_0293	591617.3	6257495.8	Low	16.3	8.3	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0295	591169.7	6259548.4	Low	8.1	4.0	0.1	null	Likely geological	null	null
BBMB_SSS_2020_0299	590572.9	6258949.2	Low	143.5	0.0	0.0	13.8	Chain, cable or rope	null	null
BBMB_SSS_2020_0300	594876.4	6250942.8	Low	4.6	2.6	0.9	null	Unidentified debris	null	null
BBMB_SSS_2020_0301	600948.0	6235346.7	Low	50.8	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0303	601640.3	6230198.7	Low	4.9	0.9	0.6	null	Unidentified debris	null	null
BBMB_SSS_2020_0304	604767.1	6223719.7	Low	8.4	0.1	0.1	null	Linear feature	null	null
BBMB_SSS_2020_0305	590504.5	6258766.4	Low	3.9	3.8	0.3	null	Potential debris	null	null

Anomaly ID	X	Y	Potential	Length (m)	Width (m)	Height (m)	Magentic (nT)	Description	UKHO ID	Wreck Name
BBMB_SSS_2020_0306	589188.1	6262015.2	Low	2.2	0.8	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0308	603322.4	6223996.3	Low	2.3	0.3	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0309	599237.8	6232567.3	Low	3.0	0.2	0.3	null	Unidentified debris	null	null
BBMB_SSS_2020_0312	598073.0	6234951.7	Low	5.0	3.4	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0313	602648.2	6222997.7	Low	52.3	20.1	0.7	null	Likely geological	null	null
BBMB_SSS_2020_0314	592567.9	6242812.9	Low	8.2	1.6	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0315	588637.7	6252968.0	Low	6.0	0.5	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0318	589409.0	6253688.0	Low	140.0	0.3	0.1	null	Fishing gear	null	null
BBMB_SSS_2020_0319	594528.6	6235922.9	Low	7.6	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0320	592693.9	6239499.9	Low	7.5	1.1	0.7	null	Likely geological	null	null
BBMB_SSS_2020_0321	593706.0	6239217.6	Low	19.6	0.5	0.3	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0322	590012.0	6238710.8	Low	3.6	0.1	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0325	588029.7	6247752.2	Low	16.1	1.7	0.3	null	Likely geological	null	null
BBMB_SSS_2020_0327	593735.6	6227880.6	Low	8.1	1.8	0.2	null	Likely geological	null	null
BBMB_SSS_2020_0328	593543.9	6224911.2	Low	53.6	0.1	0.0	null	Fishing gear	null	null
BBMB_SSS_2020_0330	593781.0	6225057.7	Low	52.1	0.2	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0331	593329.8	6228378.0	Low	11.1	4.9	0.1	null	Unidentified debris	null	null
BBMB_SSS_2020_0333	597730.2	6227677.9	Low	0.9	0.9	0.2	null	Wreck debris	null	null
BBMB_SSS_2020_0334	597746.3	6227679.6	Low	0.8	0.8	0.4	null	Wreck debris	null	null
BBMB_SSS_2020_0336	585849.7	6239500.2	Low	1.2	1.1	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0337	585670.8	6241018.7	Low	3.4	1.5	0.4	15.9	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0338	589798.8	6230184.3	Low	7.2	4.5	0.6	null	Potential debris	null	null
BBMB_SSS_2020_0339	590655.6	6228123.8	Low	5.6	2.1	0.7	null	Potential debris	null	null
BBMB_SSS_2020_0343	586461.5	6235721.5	Low	4.2	2.7	0.5	null	Likely geological	null	null
BBMB_SSS_2020_0344	579764.2	6254706.7	Low	34.6	0.2	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0345	584063.5	6242457.3	Low	5.4	0.7	0.4	44.7	Unidentified debris with magnetic anomaly	null	null
BBMB_SSS_2020_0346	585560.4	6238525.4	Low	9.0	0.7	0.3	null	Potential debris	null	null
BBMB_SSS_2020_0347	586386.8	6236526.6	Low	19.7	0.1	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0348	576100.0	6260942.0	Low	7.1	4.9	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0349	585031.1	6237661.5	Low	7.0	1.6	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0350	581805.1	6244356.0	Low	3.1	0.4	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0351	574326.5	6262294.3	Low	7.1	4.7	0.5	null	Unidentified debris	null	null
BBMB_SSS_2020_0352	575779.7	6259544.7	Low	7.8	0.1	0.0	null	Potential debris	null	null
BBMB_SSS_2020_0353	584647.1	6232431.8	Low	2.6	1.6	0.1	null	Potential debris	null	null
BBMB_SSS_2020_0354	573650.4	6258877.0	Low	16.8	0.2	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0357	579872.6	6242198.4	Low	6.3	1.1	0.2	null	Fishing gear	null	null
BBMB_SSS_2020_0358	582700.8	6233590.8	Low	27.5	8.0	0.2	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0359	579235.9	6240981.0	Low	53.9	0.1	0.0	null	Fishing gear	null	null
BBMB_SSS_2020_0361	573453.0	6257091.0	Low	2.9	3.1	0.4	null	Likely geological	null	null
BBMB_SSS_2020_0362	576693.3	6246626.6	Low	5.4	1.1	1.5	null	Unidentified debris	null	null
BBMB_SSS_2020_0363	570837.0	6258477.1	Low	3.9	2.8	0.5	null	Potential debris	null	null
BBMB_SSS_2020_0365	579586.2	6234448.0	Low	9.8	2.0	0.0	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0366	573166.0	6251889.4	Low	4.5	0.3	0.2	null	Linear feature	null	null
BBMB_SSS_2020_0367	576858.8	6242182.4	Low	3.4	5.2	0.2	null	Unidentified debris	null	null
BBMB_SSS_2020_0369	579355.9	6231286.0	Low	40.6	0.1	0.3	null	Fishing gear	null	null
BBMB_SSS_2020_0370	567202.2	6262507.9	Low	6.0	2.1	1.2	null	Likely geological	null	null
BBMB_SSS_2020_0371	579502.9	6230376.9	Low	3.9	0.2	0.0	null	Unidentified debris	null	null
BBMB_SSS_2020_0372	577113.1	6236448.6	Low	7.0	4.7	0.1	null	Chain, cable or rope	null	null
BBMB_SSS_2020_0375	580020.8	6218866.0	Low	49.4	0.2	0.4	null	Fishing gear	null	null
BBMB_SSS_2020_0376	578991.3	6222106.8	Low	4.3	0.8	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0377	578985.1	6222096.0	Low	0.8	0.4	0.4	null	Unidentified debris	null	null
BBMB_SSS_2020_0378	578990.0	6222127.8	Low	1.4	0.4	0.5	null	Unidentified debris	null	null
BBMB_SSS_2020_0379	581637.7	6254186.3	Low	3.9	0.1	0.0	null	Unidentified debris	null	null
BBMB_SSS_2020_0381	601458.8	6235142.3	Low	3.6	1.2	0.6	null	Likely geological	null	null

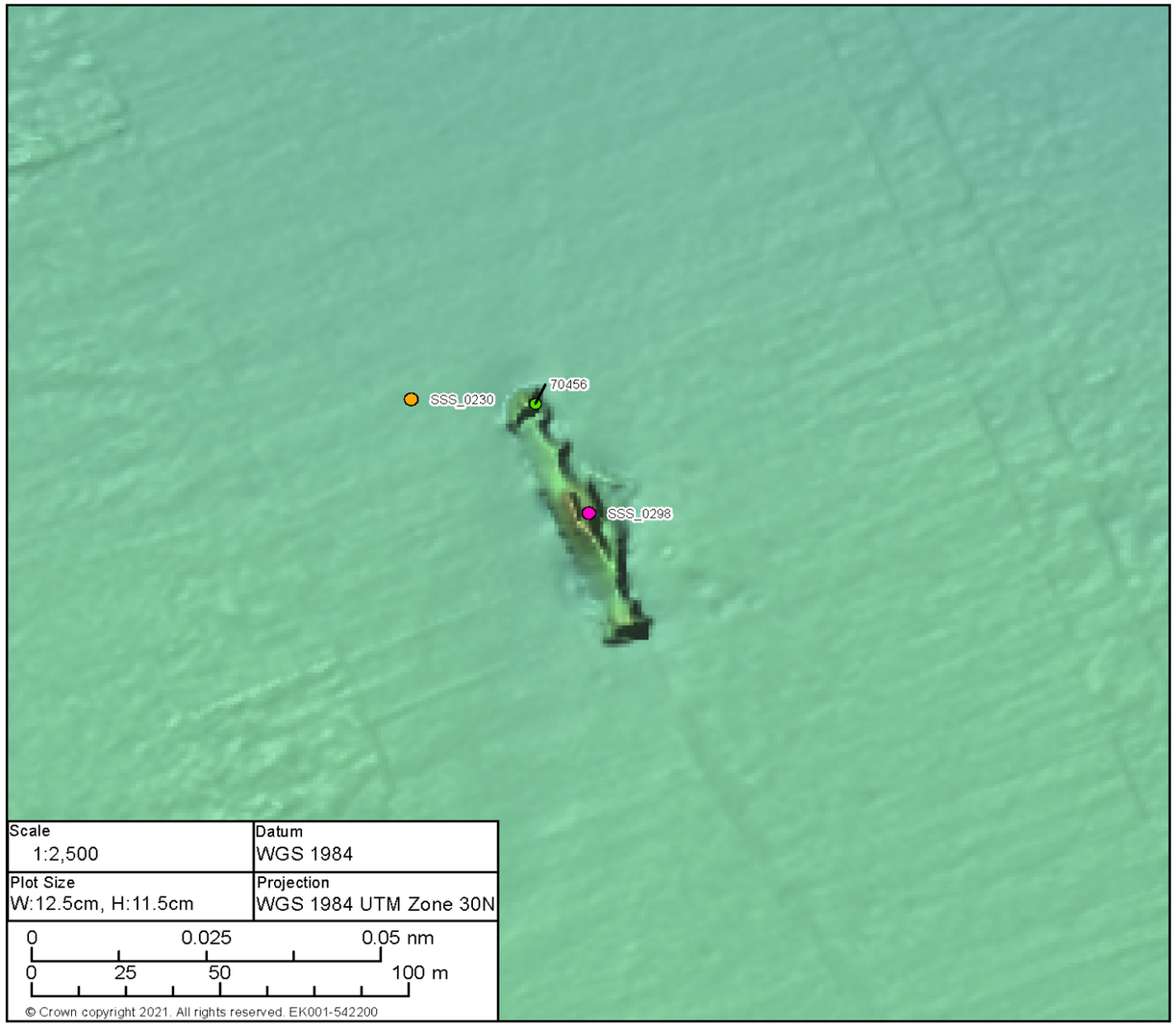
7.4. CONFIDENTIAL ANNEX D: WRECK SHEETS: HIGH POTENTIAL ARCHAEOLOGICAL ANOMALIES WITHIN LIMITS OF PROPOSED DEVELOPMENT

High Potential Contact BBMB_SSS_2020_0298			
Position coordinates	590519.6 E, 6259051.7 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 76.2 m x 19.7 m x 3.8 m high Contact is associated with magnetic anomaly 56,127.2 nT and medium potential BBMB_sss_2020_0298 UKHO 70456		
Build	Type	Unknown	
	Construction	Form and evidence of significant magnetic anomaly suggest metal construction	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Degraded but coherent remains of a wrecked vessel. The wreck shows evidence of collapse along the length with debris extending to the seabed from mid -section. Debris is noted in immediate vicinity.		

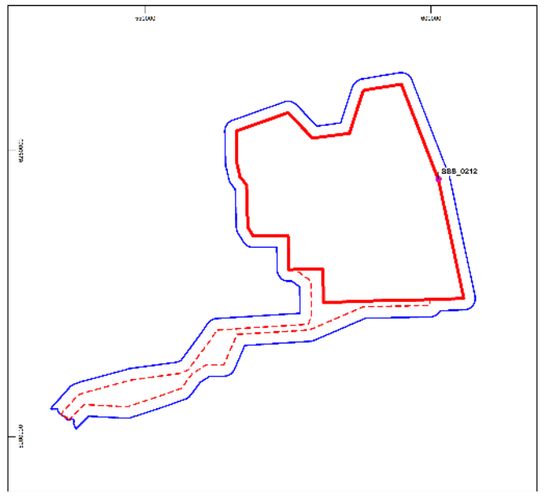


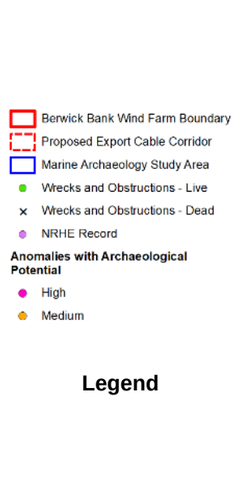


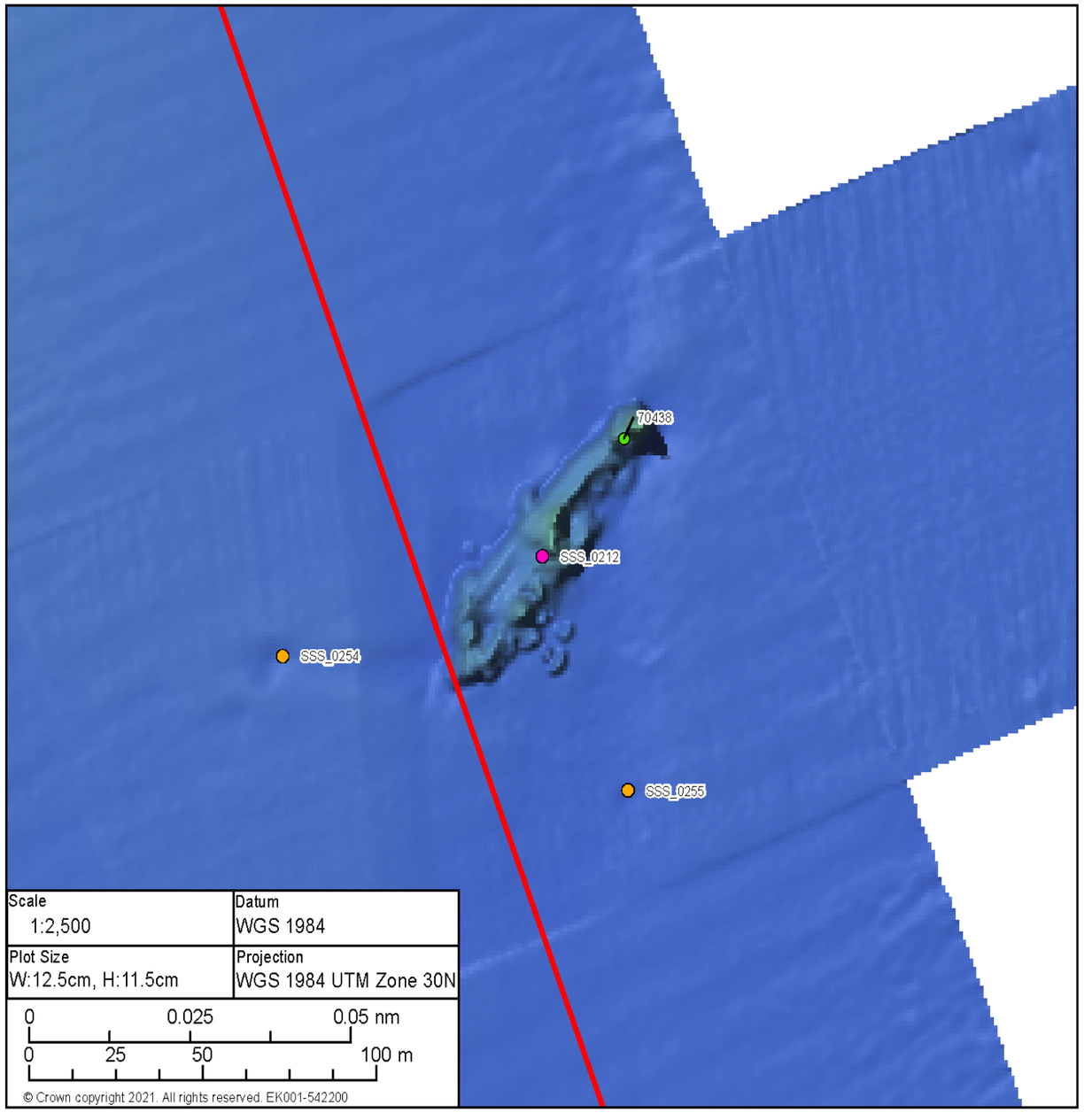
Legend



High Potential Contact BBMB_SSS_2020_0212			
Position coordinates	601282.4 E 6245056.7 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 91.6 m x 37.7 m x 6.1 m high Contact is associated with magnetic anomaly 1,056.7 and large debris adjacent 50 m to the west (BBMB_SSS_2020_0254) and 60 m to the south (BBMB_SSS_2020_0255)		
Build	Type	Likely to be the Swedish Steamship Oswin (recorded by UKHO 70438)	
	Construction	Form and evidence of significant magnetic anomaly suggest metal construction	
	Dimensions	Unknown	
	Shipyard	Built in Whitby in 1890	
Loss	Cause	Cargo ship on voyage to Goteburg carrying coal when it was sunk by a German submarine in 1918. No lives were lost;	
Extent of survival	Coherent remains of a wrecked vessel. The wreck appears to be lying on its side and orientated north-east, south-west. The whole wreck shows evidence of collapse but it is more prominent to the south-west. Scour is visible around the wreck; however, it appears fairly localised.		

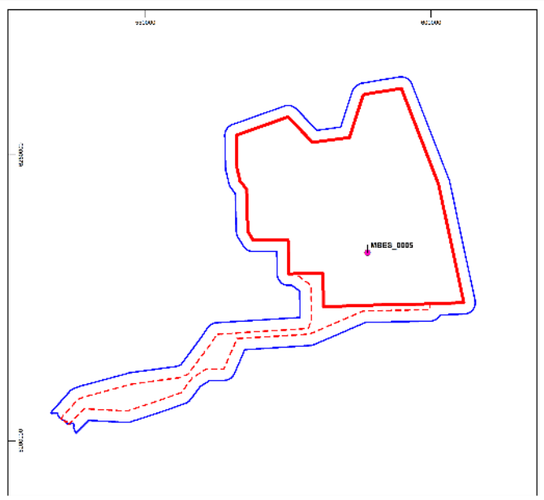






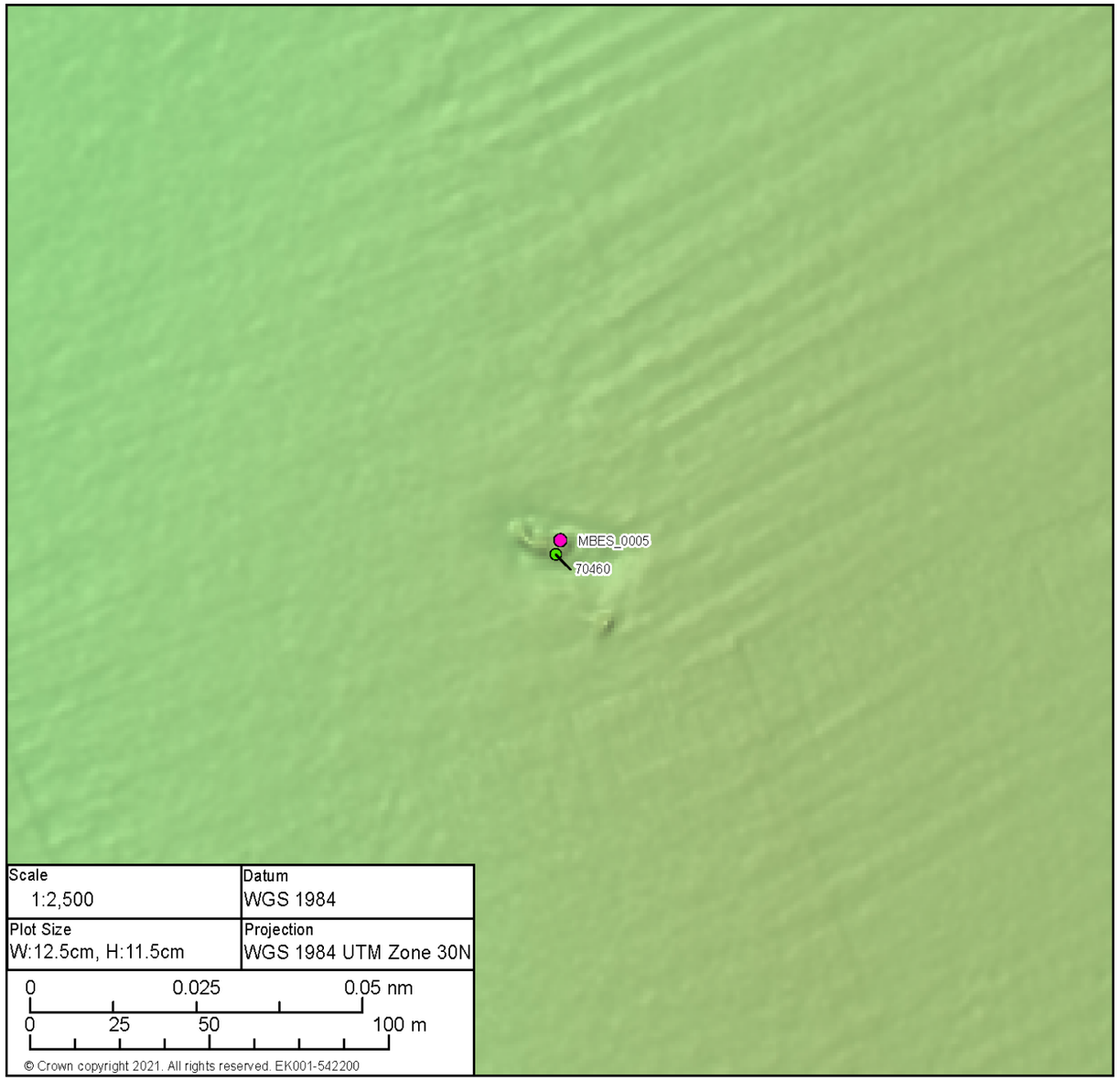
High Potential Contact BBMB_MBES_2020_0005

Position coordinates	588871.4 E 6232899.6 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 41.5 m x 12.3 m x 0.8 m high Contact is not associated with any magnetic anomaly UKHO Ref 70460		
Build	Type	Unknown	
	Construction	Unknown	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	The visible remains appear to show one section of the wreck lying east, west, potentially the bow, to the north and further visible debris to the south. Scour is evident to the south and east of the main section of wreckage. It is not possible to determine the construction type with the data available. The wreck was first identified in 2007, through survey, as a highly degraded wreck measuring 70.5 m x 34.4 m. The differences in observed measurements are likely the result of sediment movement or continued degradation since 2007		



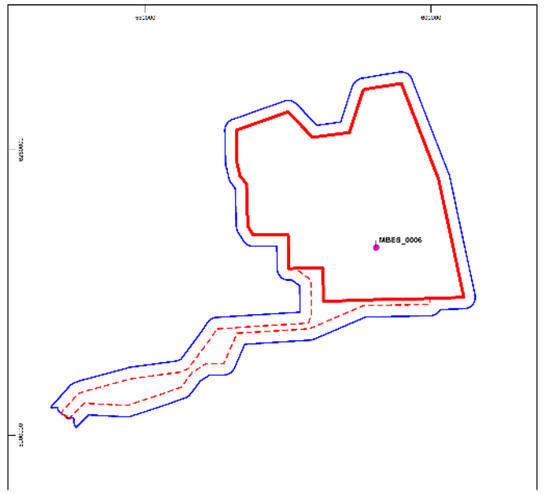
Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

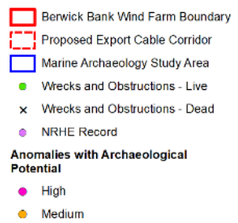
Legend



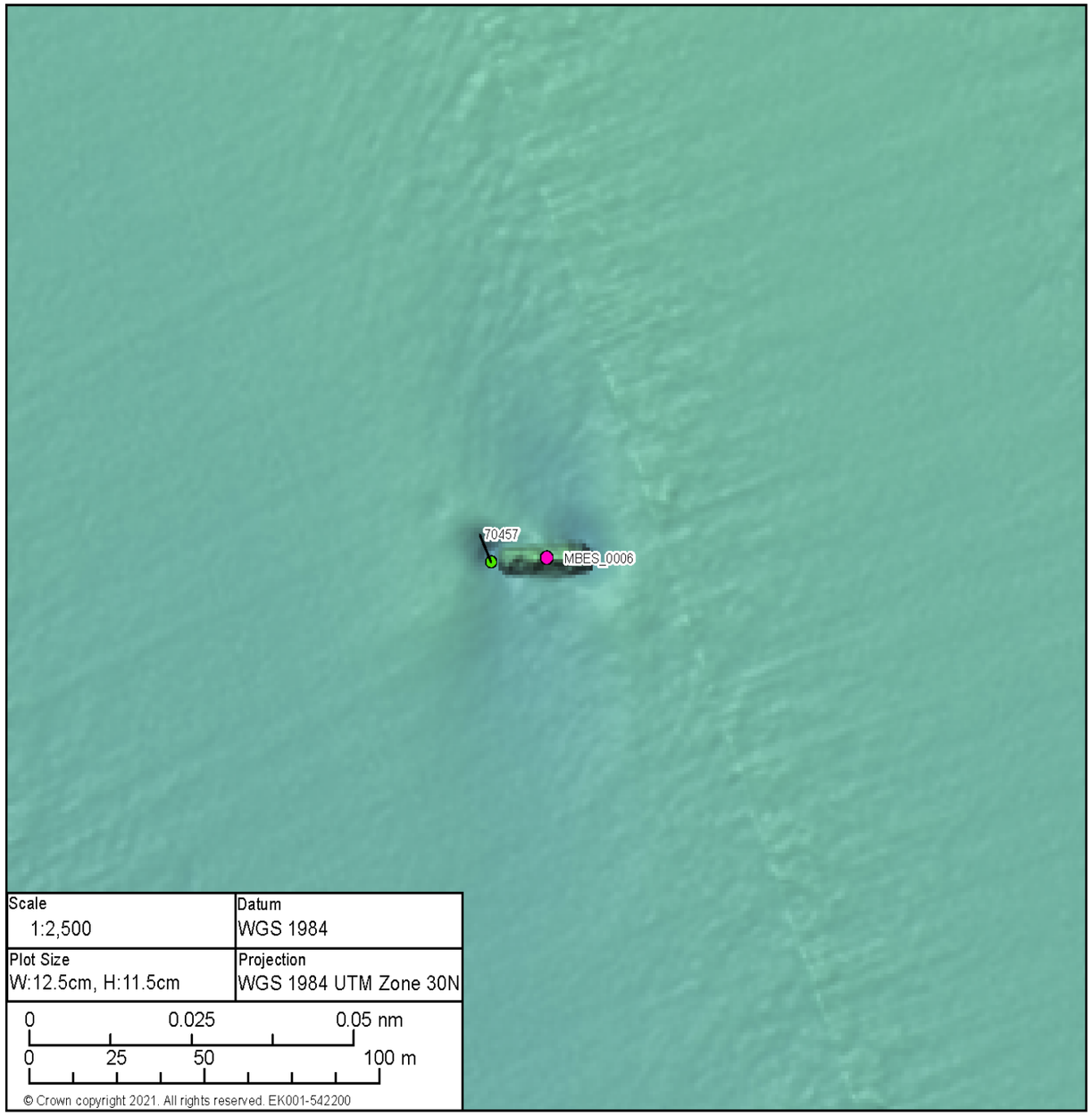
High Potential Contact BBMB_MBES_2020_0006

Position coordinates	590388.3 E 6232872.8 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 28.5 m x 8.5 m x 3.0 m high Contact is not associated with any magnetic anomaly UKHO Ref 70457		
Build	Type	Unknown	
	Construction	Likely of metal construction	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	The wreck is lying east, west, and with prominent scour to each end. The form of the wreck is coherent and there is little evidence of outlying debris. The wreck was first identified in 2007, through survey, as an intact wreck measuring 46.2 m x 12.2 m with bows to the east and a list to port. There is a notable difference in dimensions, however there is no evidence of degradation or burial that would account for this,		

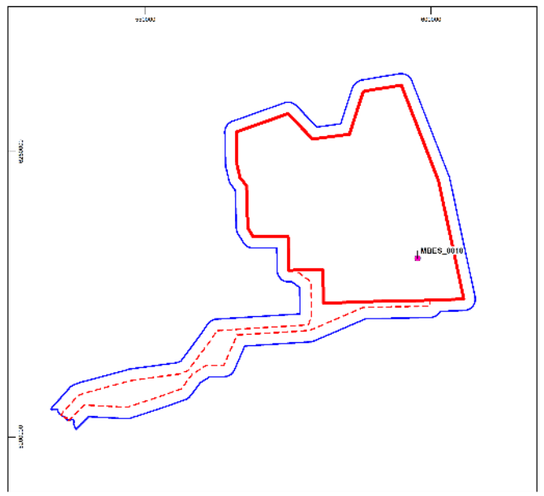




Legend

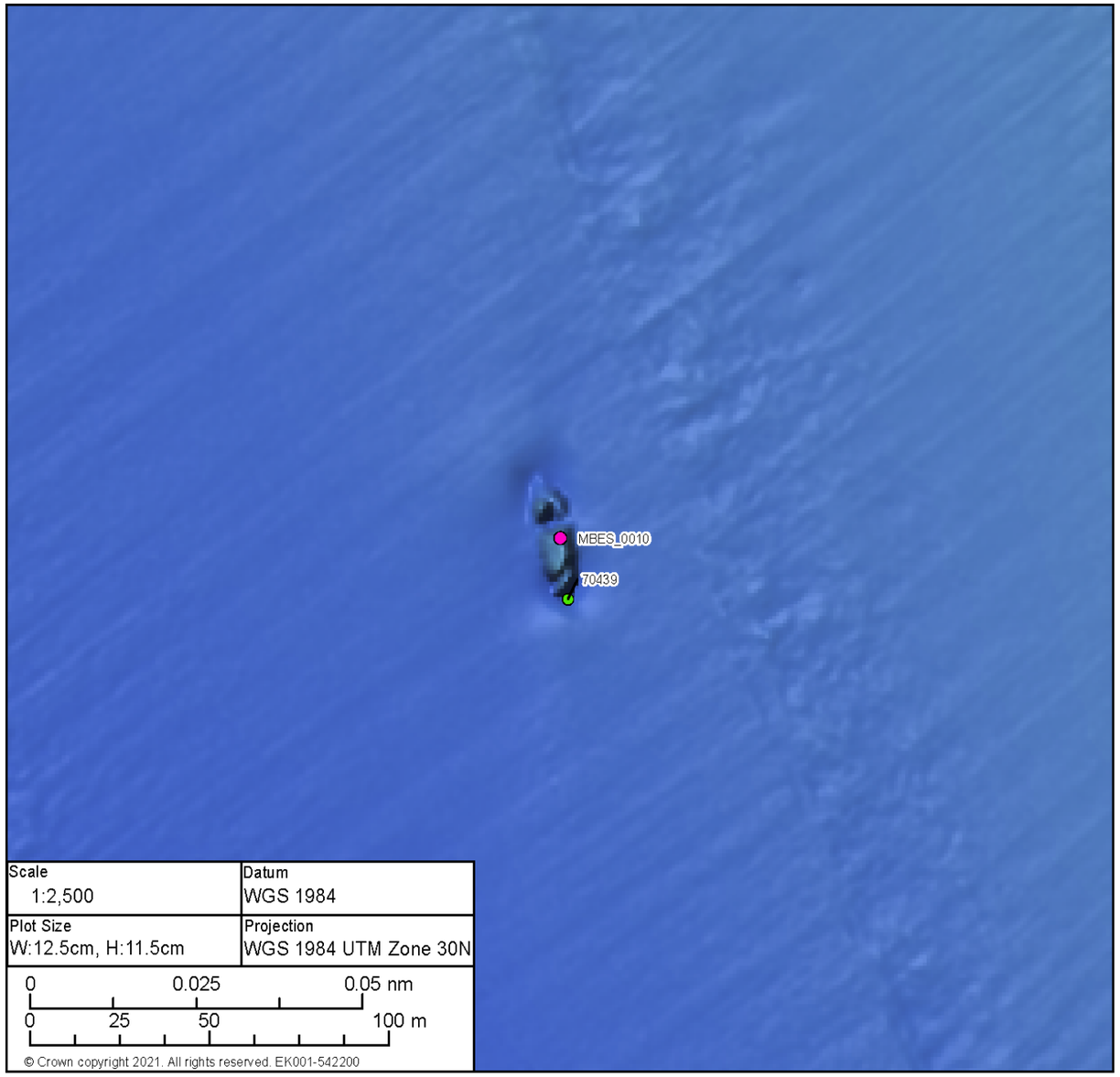


High Potential Contact BBMB_MBES_2020_0010			
Position coordinates	597610.4 E 6231315.9 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 34.0 m x 10.7 m x 2.7 m high Contact is not associated with any magnetic anomaly UKHO ref 70439		
Build	Type	Unknown	
	Construction	Likely of steel construction	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Broken up remains of a wrecked vessel with the bow to the north. The wreck is in two distinct, and separated, sections with further evidence of an addition break to towards the stern. The wreck sits within an area of scour, more prominent to the bow and the stern. There is little evidence of outlying debris. First identified in 2007, through survey, as an intact, upright wreck, with the hold visible. Whilst the current dimensions correlate with those from 2007 the wreck can no longer be classed as intact.		



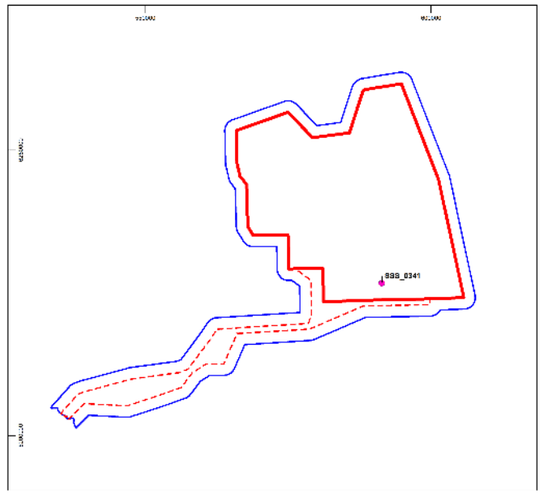
Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

Legend



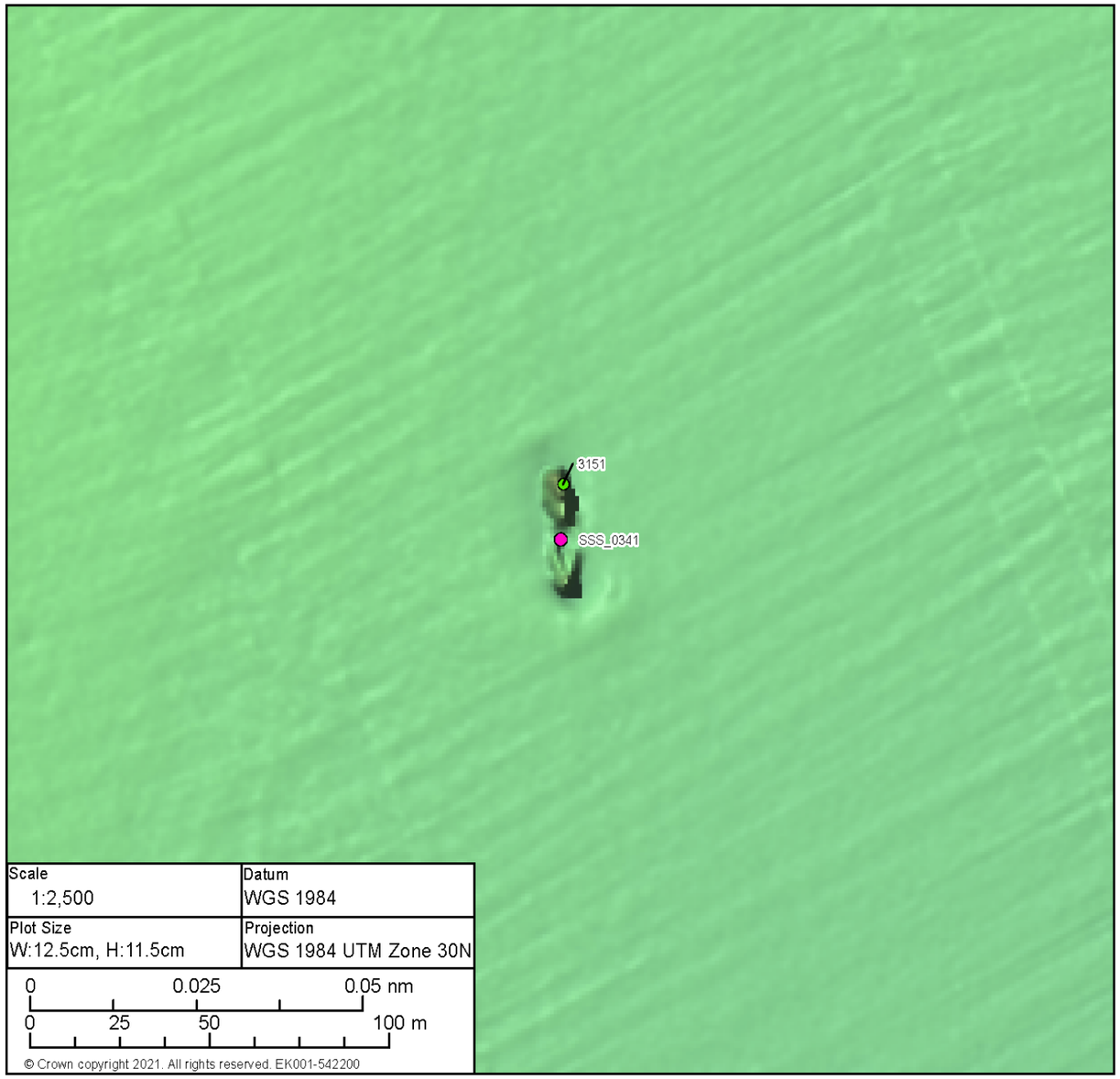
High Potential Contact BBMB_SSS_2020_0341

Position coordinates	591366.5 E 6226686.0 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 33.5 m x 7.6 m x 3.3 m high Contact is not associated with a magnetic anomaly UKHO ref 3151		
Build	Type	Likely to be the Fishing Trawler Kitty recorded by UKHO	
	Construction	Likely of metal construction	
	Dimensions	32.0 m x 6.4 m	
	Shipyard	Built by Earle's Co, Hull in 1898	
Loss	Cause	En-route to Peterhead and captured by submarine and sunk by explosives in 1917. No lives were lost	
Extent of survival	The wreck is coherent in form, upright, and with the bow to the south. There is evidence of collapse amidships with the bow and stern remaining prominent. There is potentially small, localised debris towards the bow on the port side. Slight scour is evident around the wreck, more prominent towards the bow.		



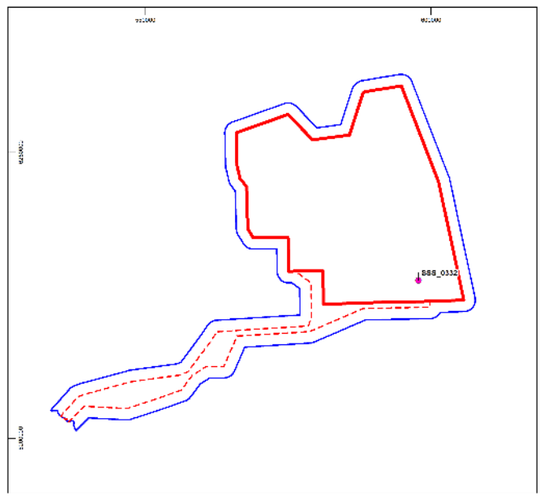
Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

Legend



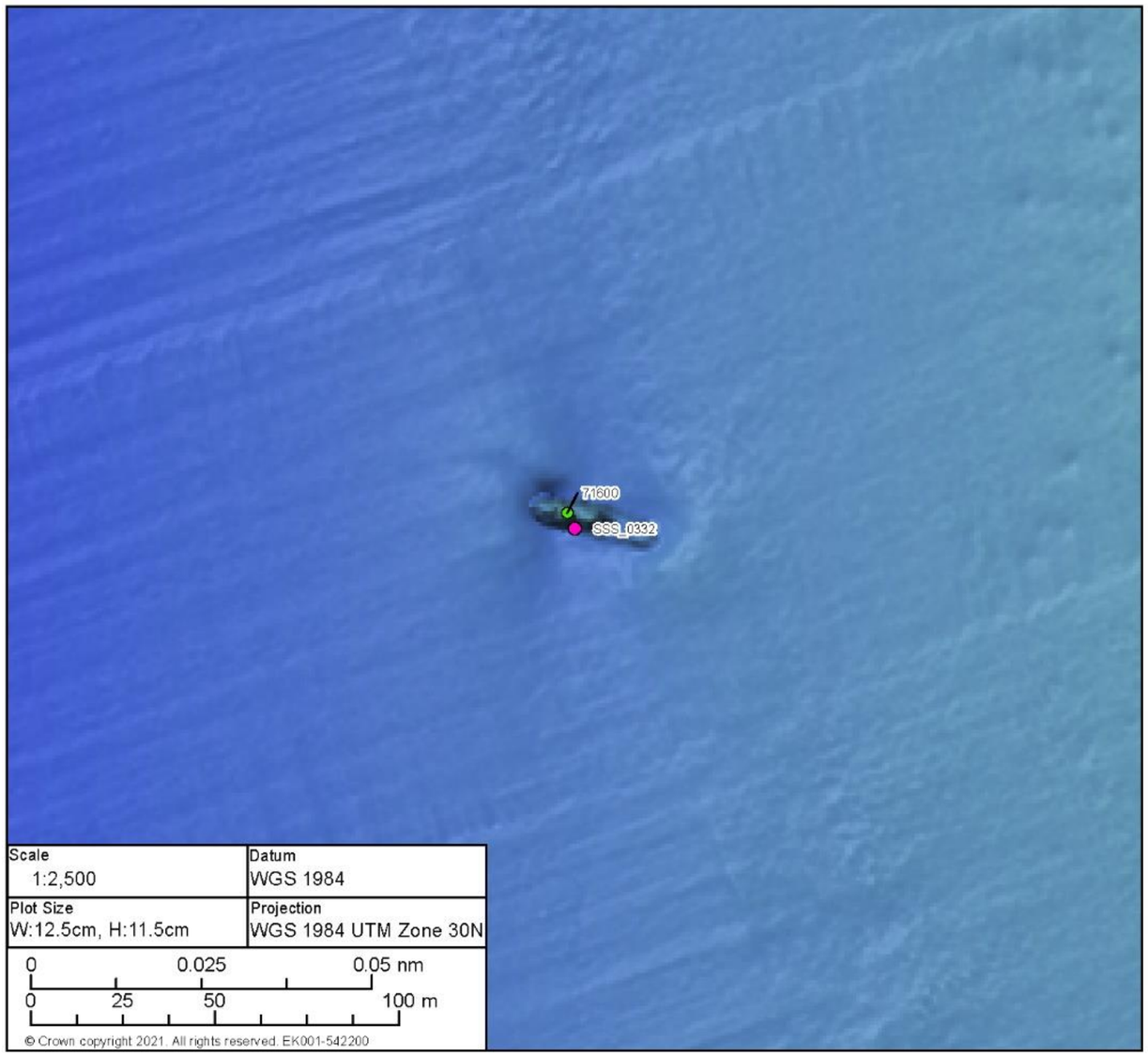
High Potential Contact BBMB_SSS_2020_0332

Position coordinates	597770.1 E 6227609.8 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 35.6 m x 8.6 m x 2.3 m high Contact is not associated with a magnetic anomaly UKHO ref 71600		
Build	Type	Unknown	
	Construction	Unknown	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	The visible remains of the vessel potentially indicate the bow lies to the south-east. There is evidence of outlying debris within the immediate vicinity of the wreck. Scour is present, although conversely there appears to be an accretion of material to the bow and the stern.		

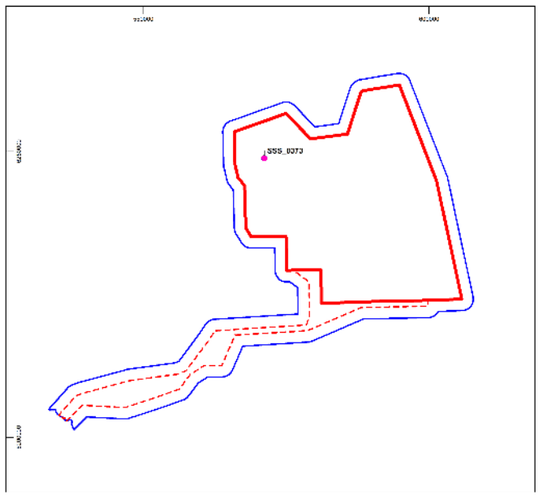


Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

Legend



High Potential Contact BBMB_SSS_2020_0373				
Position coordinates	571145.9 E 6248792.9 N		***Area***	Proposed Development array area
Archaeological potential	High			
Geophysical survey dimensions and notes	Dimensions: 33.1 m x 10.8 m x 8.7 m high Contact is not associated with a magnetic anomaly UKHO ref 70467			
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of survival	Coherent remains of a small, wrecked vessel with the bow potentially lying to the south, east. The vessel does not appear broken, however there is potential evidence of collapse towards the stern. Scour is evident around the wreck, most prominent to the stern but also extending north-east and south-west. The wreck was first identified in 2007, through survey, as an upright, intact wreck measuring 41.3 m x 12.6 m. It is unclear where the difference in length originates as there is no evidence of collapsed or buried wreckage past the extents of that identified during this assessment.			



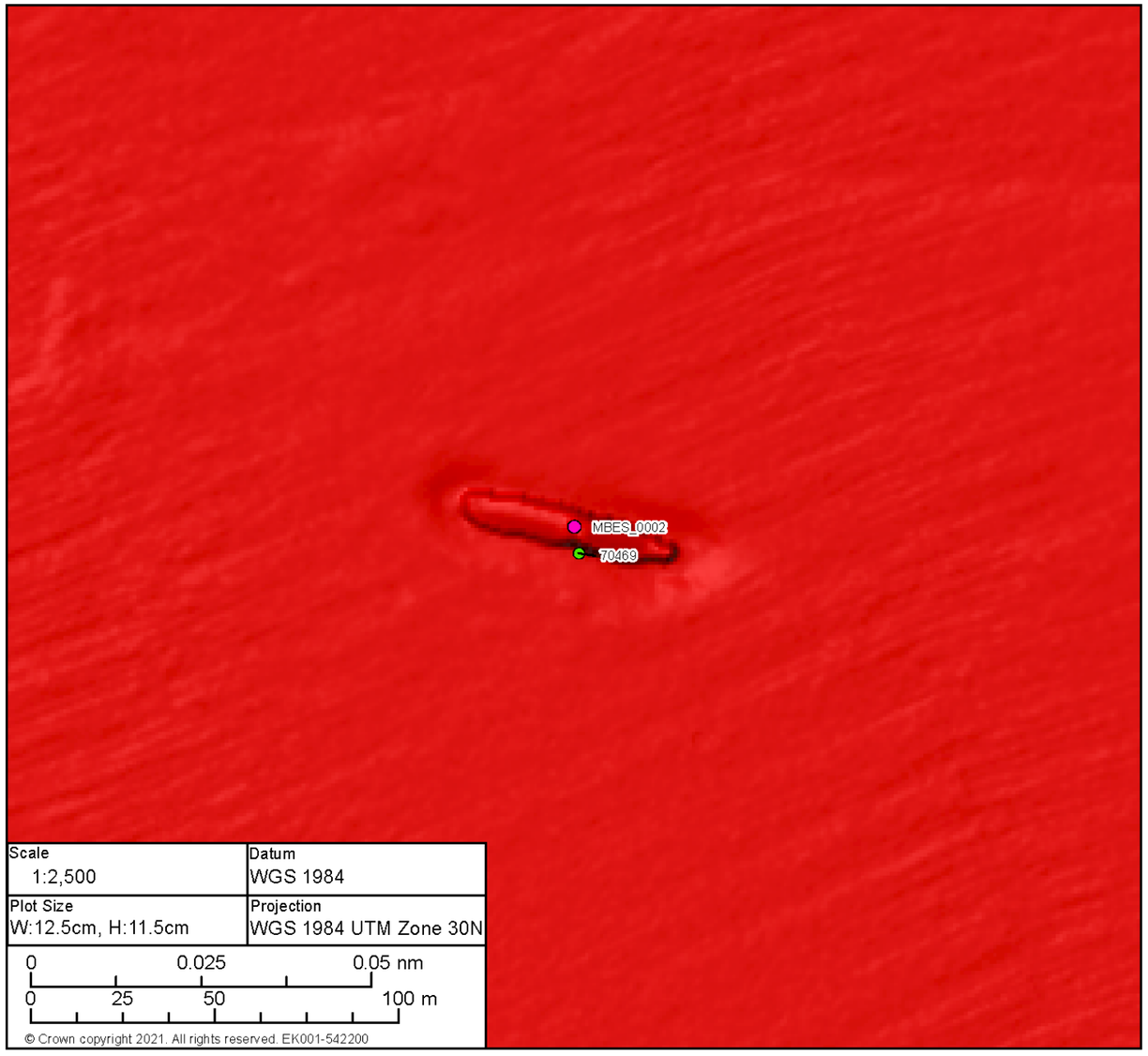
Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

Legend

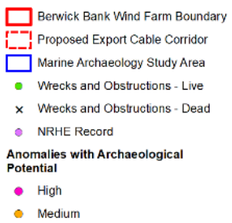
High Potential Contact BBMB_MBES_2020_0002			
Position coordinates	567551.6 E 6246444.9 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 60.5 m x 10.4 m x 3.4 m high Contact is not associated with a magnetic anomaly UKHO ref 70469		
Build	Type	Unknown	
	Construction	Likely of metal construction	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Prominent remains of a wrecked vessel. The wreck appears largely intact and is highly likely to be inverted, scour is evident along all sides although it is less prominent to the north. There is little evidence of any outlying debris.		

Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

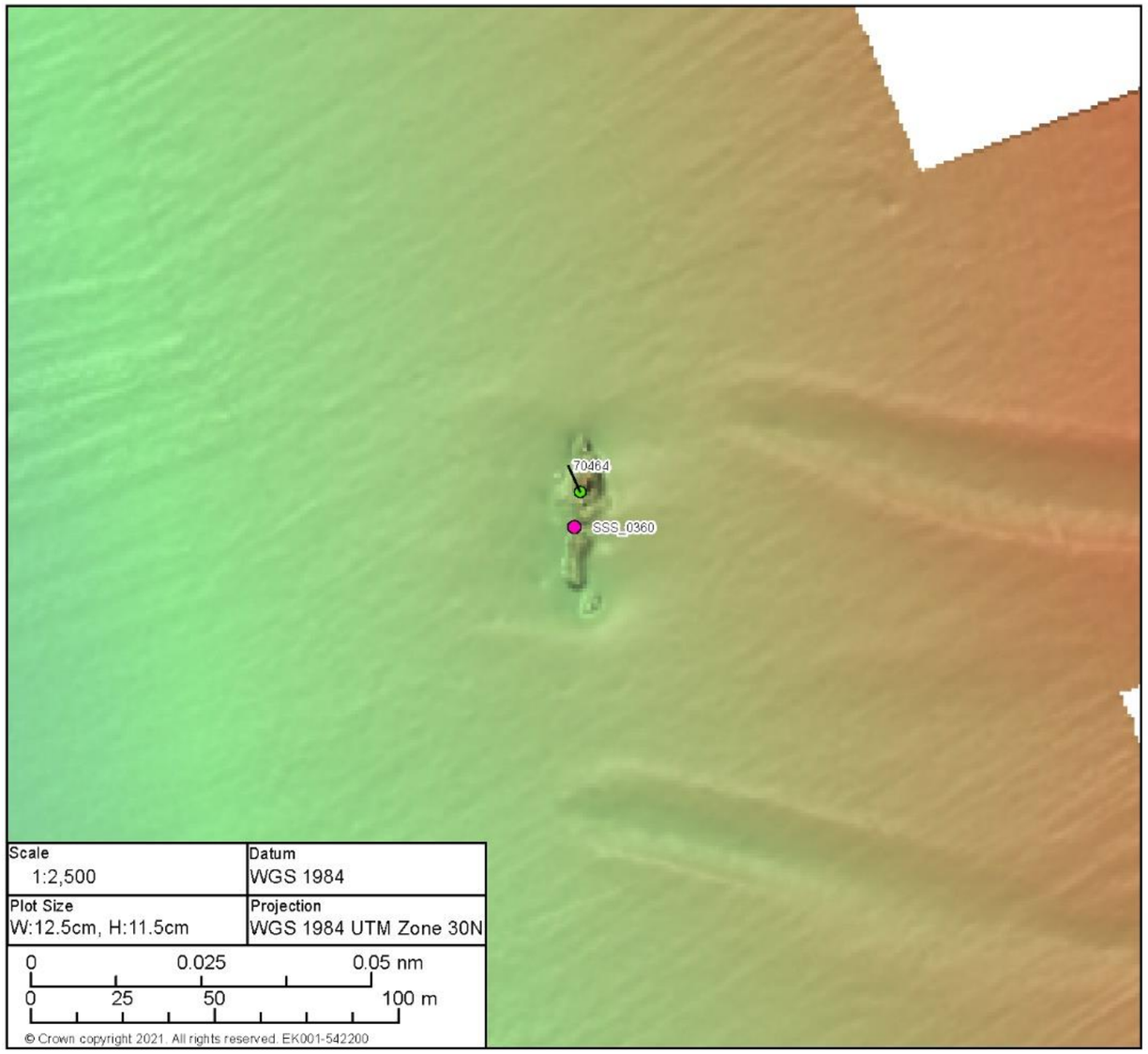
Legend



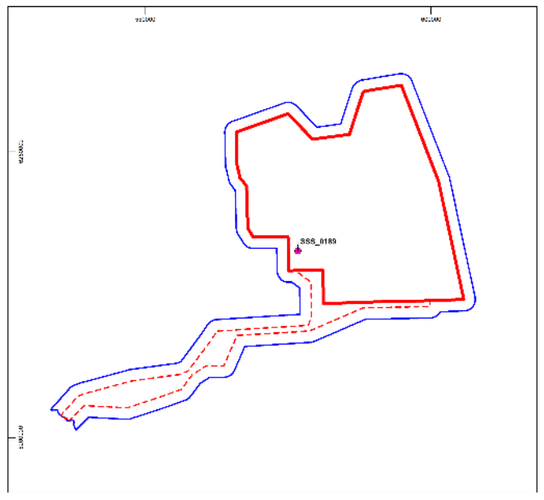
High Potential Contact BBMB_SSS_2020_0360				
Position coordinates	577863.1 E 6245712.0 N		***Area***	Proposed Development array area
Archaeological potential	High			
Geophysical survey dimensions and notes	Dimensions: 48.1 m x 14.2 m x 2.3 m high Contact is associated with a significant magnetic anomaly of 13,071.7 nT UKHO ref 70464			
Build	Type	Unknown		
	Construction	Likely of metal construction		
	Dimensions	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of survival	Very broken up remains of a wrecked vessel. The wreck is in two main sections orientated north, south with the most prominent remains to the south. A further smaller section lies to the south. Debris extents around the wreck but is largely confined to the footprint of the site. Scour is visible around the site.			



Legend

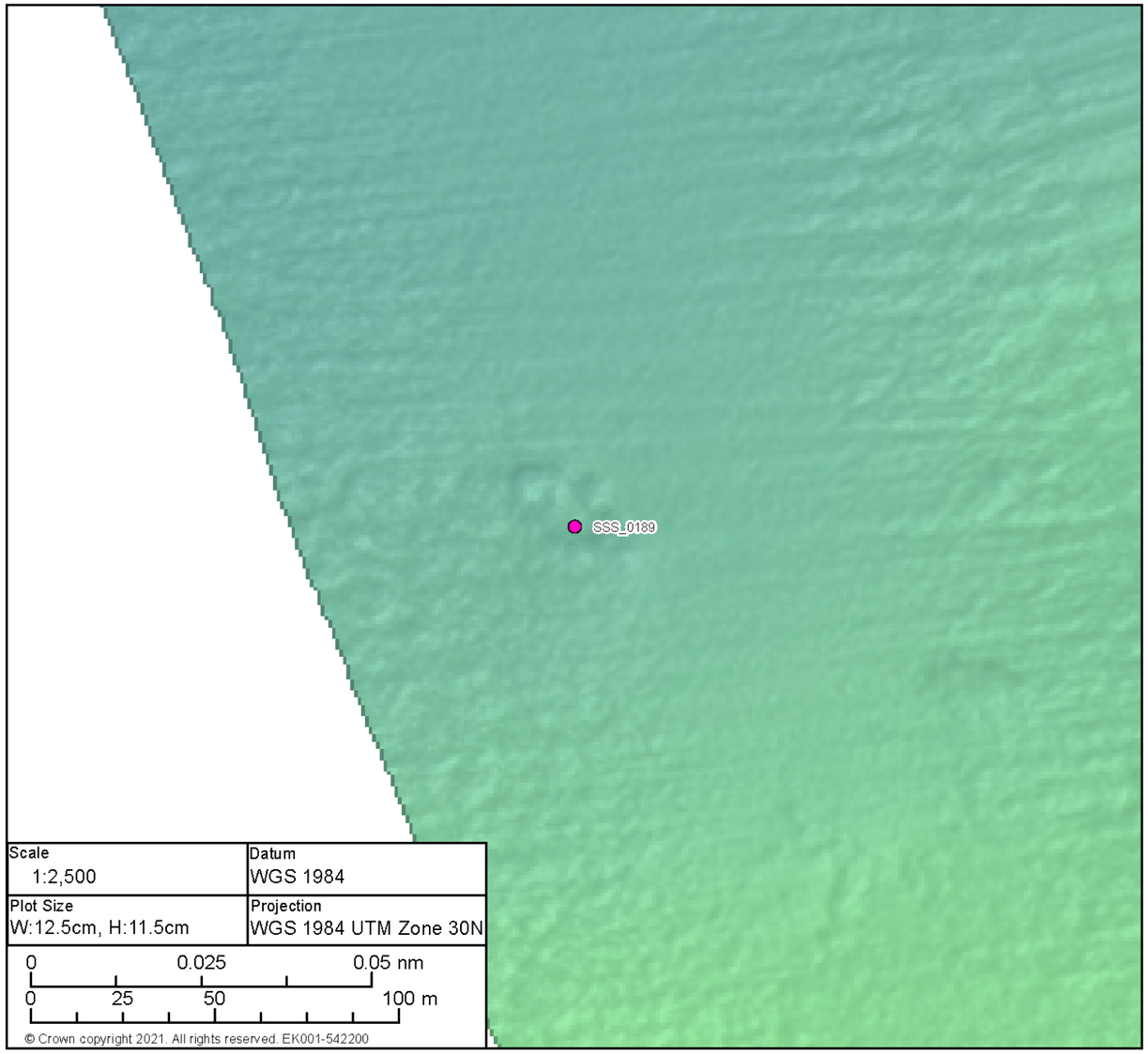


High Potential Contact BBMB_SSS_2020_0189			
Position coordinates	574835.5 E 6230067.7 N	***Area***	Proposed Development array area
Archaeological potential	High		
Geophysical survey dimensions and notes	Dimensions: 36.2 m x 19.1 m x 1.0 m high Contact is not associated with a magnetic anomaly nor has it been recorded on the UKHO		
Build	Type	Unknown	
	Construction	Of metal construction	
	Dimensions	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of survival	Potential remains of a wrecked vessel. The form of the anomaly is vessel like in shape and comprises a distinct area of potential with anthropogenic debris characterised by multiple features many of which are linear in form. The wreck is low lying and very broken up, scour is evident around all sides, however it is more prominent to the north.		

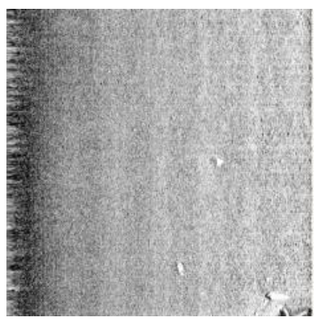


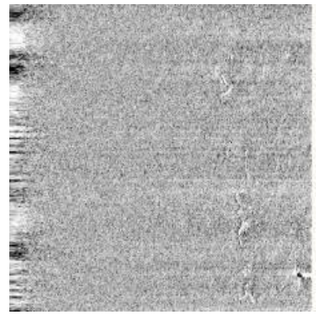
Berwick Bank Wind Farm Boundary
Proposed Export Cable Corridor
Marine Archaeology Study Area
Wrecks and Obstructions - Live
Wrecks and Obstructions - Dead
NRHE Record
Anomalies with Archaeological Potential
High
Medium

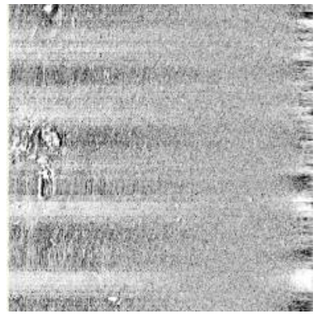
Legend

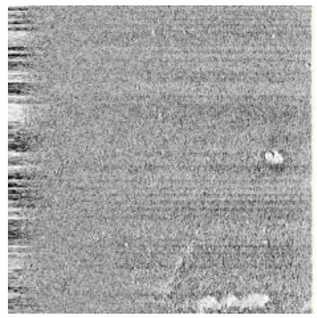


7.5. CONFIDENTIAL ANNEX E: INFORMATION SHEETS: MEDIUM POTENTIAL ARCHAEOLOGICAL ANOMALIES

Medium Potential Contact BBMB_SSS_0230		
Anomaly number	BBMB_SSS_0230	
Location	Proposed Development array area	
Position coordinates	590472.5E 6259083.4 N	
Archaeological potential	Medium	
Measurements: 1.1 m x 0.6 m x 0.1 m High This contact is not associated with any Magnetic Anomaly Wreck debris		

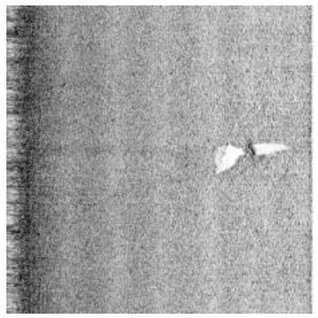
Medium Potential Contact BBMB_SSS_0258		
Anomaly number	BBMB_SSS_0258	
Location	Proposed Development array area	
Position coordinates	595006.5 E 6260421.3 N	
Archaeological potential	Medium	
Measurements: 38.1 m x 2.7 m x 0.1 m high This contact is not associated with any Magnetic Anomaly Unidentified debris		

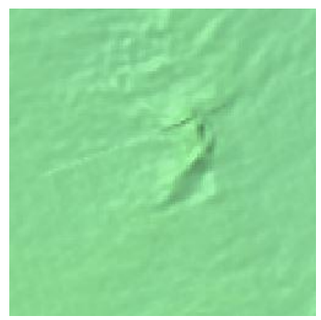
Medium Potential Contact BBMB_SSS_0294		
Anomaly number	BBMB_SSS_0294	
Location	Proposed Development array area	
Position coordinates	592454.3 E 6255077.3 N	
Archaeological potential	Medium	
Measurements: 12.2 m x 8.0 m x 0.1 m high This contact is not associated with any Magnetic Anomaly Likely geological		

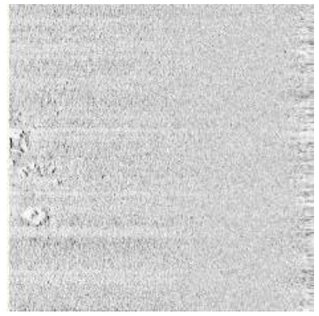
Medium Potential Contact BBMB_SSS_0255		
Anomaly number	BBMB_SSS_0255	
Location	Proposed Development array area	
Position coordinates	601307.1 E 6244996.6 N	
Archaeological potential	Medium	
Measurements: 1.7 m x 1.7 m x 0.3 m high This contact is not associated with any Magnetic Anomaly Wreck debris		

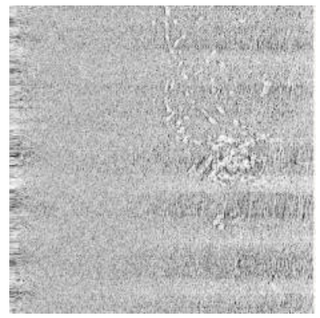
Medium Potential Contact BBMB_SSS_0254		
Anomaly number	BBMB_SSS_0254	
Location	Proposed Development array area	
Position coordinates	601207.6 E 6245031.1 N	
Archaeological potential	Medium	
Measurements: 11.8 m x 7.1 m x 1.3 m high This contact is associated with a Magnetic Anomaly of 288.8 nT Wreck debris		

Medium Potential Contact BBMB_SSS_0311		
Anomaly number	BBMB_SSS_0311	
Location	Proposed Development array area	
Position coordinates	595997.4 E 6242134.5 N	
Archaeological potential	Medium	
Measurements: 5.9 m x 3.2 m x 0.2 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

Medium Potential Contact BBMB_SSS_0209		
Anomaly number	BBMB_SSS_0209	
Location	Proposed Development array area	
Position coordinates	596419.7 E 6237798.6 N	
Archaeological potential	Medium	
Measurements: 7.8 m x 4.1 m x 0.6 m high This contact is not associated with a Magnetic Anomaly Likely geological		

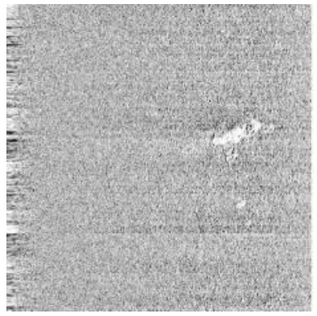
Medium Potential Contact BBMB_MBES_0007		
Anomaly number	BBMB_MBES_0007	
Location	Proposed Development array area	
Position coordinates	591704.6 E 6233921.9 N	
Archaeological potential	Medium	
Measurements: 32.6 m x 6.6 m x 1.1 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

Medium Potential Contact BBMB_SSS_0317		
Anomaly number	BBMB_SSS_0317	
Location	Proposed Development array area	
Position coordinates	597156.8 E 6233525.5 N	
Archaeological potential	Medium	
Measurements: 16.1 m x 8.2 m x 0.2 m high This contact is not associated with a Magnetic Anomaly Potential debris		

Medium Potential Contact BBMB_SSS_0340		
Anomaly number	BBMB_SSS_0340	
Location	Proposed Development array area	
Position coordinates	591642.8 E 6227315.5 N	
Archaeological potential	Medium	
Measurements: 31.2 m x 13.2 m x 0.2 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

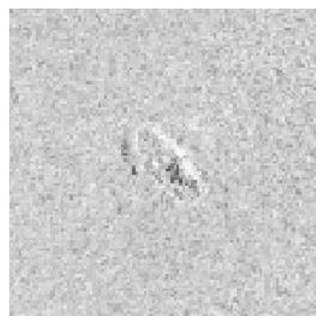
Medium Potential Contact BBMB_MBES_0015		
Anomaly number	BBMB_MBES_0015	
Location	Proposed Development array area	
Position coordinates	599253.7 E 6225536.9 N	
Archaeological potential	Medium	
Measurements: 20.9 m x 16.3 m x 1.2 m high This contact is not associated with a Magnetic Anomaly Mound		

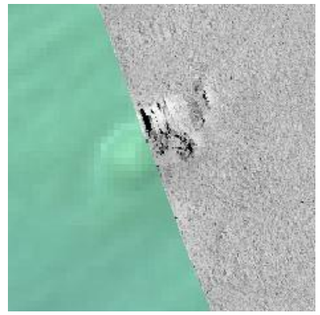
Medium Potential Contact BBMB_SSS_0329	
Anomaly number	BBMB_SSS_0329
Location	Proposed Development array area
Position coordinates	589027.1 E 6237440.2 N
Archaeological potential	Medium
Measurements: 14.7 m x 12.3 m x 0.2 m high This contact is not associated with a Magnetic Anomaly Unidentified debris	

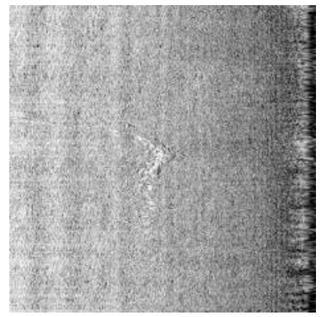


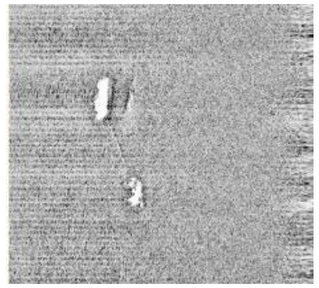
Medium Potential Contact BBMB_MBES_0009	
Anomaly number	BBMB_MBES_0009
Location	Proposed Development array area
Position coordinates	591260.0 E 6234573.3 N
Archaeological potential	Medium
Measurements: 25.3 m x 4. 5 m x 0.9 m high This contact is not associated with a Magnetic Anomaly Unidentified debris	

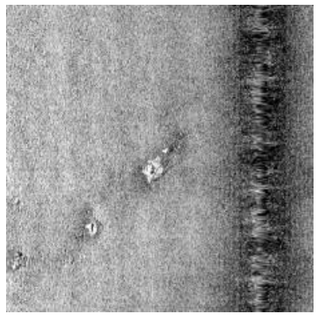
Medium Potential Contact BBMB_SSS_0380	
Anomaly number	BBMB_SSS_0380
Location	Proposed Development array area
Position coordinates	586970.2 E 6232104.8 N
Archaeological potential	Medium
Measurements: 7.5 m x 3.4 m x 0.3 m high This contact is not associated with a Magnetic Anomaly Seabed disturbance	



Medium Potential Contact BBMB_SSS_0368		
Anomaly number	BBMB_SSS_0368	
Location	Proposed Development array area	
Position coordinates	570872.7 E 6255445.0 N	
Archaeological potential	Medium	
Measurements: 16.7 m x 8.1 m x 1.1 m high This contact is not associated with a Magnetic Anomaly Mound		

Medium Potential Contact BBMB_SSS_0136		
Anomaly number	BBMB_SSS_0136	
Location	Proposed Development array area	
Position coordinates	573999.2 E 6250628.2 N	
Archaeological potential	Medium	
Measurements: 13.4 m x 9.0 m x 0.3 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

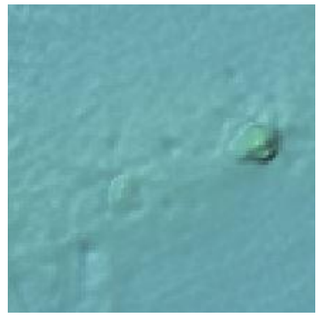
Medium Potential Contact BBMB_SSS_0364		
Anomaly number	BBMB_SSS_0364	
Location	Proposed Development array area	
Position coordinates	577231.7 E 6239666.5 N	
Archaeological potential	Medium	
Measurements: 23.8 m x 3.3 m 0.4 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

Medium Potential Contact BBMB_SSS_0178		
Anomaly number	BBMB_SSS_0178	
Location	Proposed Development array area	
Position coordinates	567819.5 E 6237262.4 N	
Archaeological potential	Medium	
Measurements: 34.5 m x 3. 6 m x 0.2 m high This contact is associated with a Magnetic Anomaly up to 44.94nT Unidentified debris with magnetic anomaly		

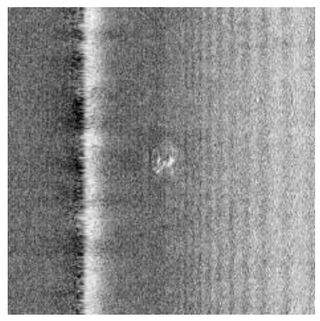
Medium Potential Contact BBMB_SSS_0374		
Anomaly number	BBMB_SSS_0374	
Location	Proposed Development export cable corridor	
Position coordinates	579361.4 E 6225549.2 N	
Archaeological potential	Medium	
Measurements: 140.8 m x 36.3 m x 0.8 m high This contact is associated with a Magnetic Anomaly up to 88.2 nT Unidentified debris with magnetic anomaly		

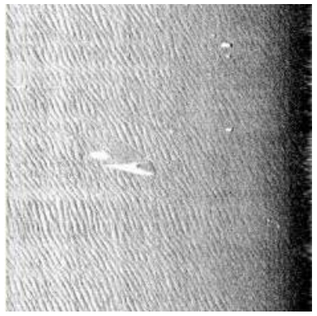
Medium Potential Contact BBMB_MBES_0008	
Anomaly number	BBMB_MBES_0008
Location	Proposed Development array area
Position coordinates	591460.0 6234080.5
Archaeological potential	Medium
Measurements: 44.9.m x 23.3 m x 1.2 m high This contact is not associated with a magnetic anomaly Unidentified debris	

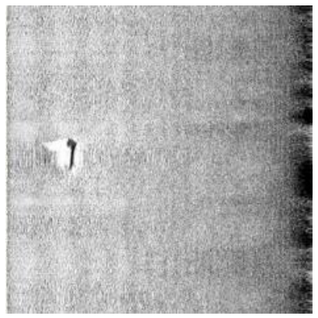
Medium Potential Contact BBMB_MBES_0016	
Anomaly number	BBMB_MBES_0016
Location	Proposed Development array area
Position coordinates	591068.8 6258079.9
Archaeological potential	Medium
Measurements: 103.2. m x 30.9 m x 1.1 m high This contact is not associated with a magnetic anomaly Likely geological	

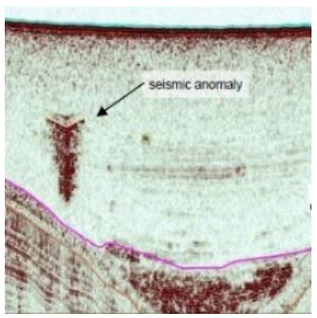


Medium Potential Contact BBMB_SSS_0089	
Anomaly number	BBMB_SSS_0089
Location	Proposed Development export cable corridor
Position coordinates	593403.5 E 6223700.3 N
Archaeological potential	Medium
Measurements: 6.1 m x 4.7 m x 0.3 m high This contact is not associated with a Magnetic Anomaly Seabed disturbance	



Medium Potential Contact BBMB_SSS_0092		
Anomaly number	BBMB_SSS_0092	
Location	Proposed Development export cable corridor	
Position coordinates	567172.9 E 6218924.3 N	
Archaeological potential	Medium	
Measurements: 11.0 m x 3.3 m x 0.9 m high This contact is not associated with a Magnetic Anomaly Unidentified debris		

Medium Potential Contact BBMB_SSS_0028		
Anomaly number	BBMB_SSS_0028	
Location	Proposed Development export cable corridor	
Position coordinates	562254.0 E 6217904.9 N	
Archaeological potential	Medium	
Measurements: 5.6 m x 1.6 m x 0.5 m high This contact is not associated with a Magnetic Anomaly Potential debris		

Medium Potential Contact BBMB_SBP_0001		
Anomaly number	BBMB_SBP_0001	
Location	Proposed Development export cable corridor	
Position coordinates	549261.0 E 6206294.0 N	
Archaeological potential	Medium	
Measurements: N/A This contact is not associated with a Magnetic Anomaly Unidentified anomaly		

7.6. CONFIDENTIAL ANNEX F: GAZETTEER OF MAGNETIC ANOMALIES

Table 7.5: Gazetteer of Potential Magnetic Anomalies

Anomaly ID	X	Y	Description	Intensity (nT)
BBMB_MAG_2020_0024	550094.0	6206277.6	Large magnetic anomaly	123.8
BBMB_MAG_2020_0045	557518.3	6210995.0	Large magnetic anomaly	170.2
BBMB_MAG_2020_0049	558202.7	6211783.0	Linear feature	119.2
BBMB_MAG_2020_0069	560459.8	6214316.4	Large magnetic anomaly	194.8
BBMB_MAG_2020_0097	561048.0	6215605.4	Linear feature	118.8
BBMB_MAG_2020_0163	562669.8	6218592.7	Large magnetic anomaly	107.4
BBMB_MAG_2020_0168	562611.6	6218643.1	Large magnetic anomaly	113.5
BBMB_MAG_2020_0360	599124.1	6223901.7	Large magnetic anomaly	116.1
BBMB_MAG_2020_0463	578652.8	6220795.2	Large magnetic anomaly	129.1
BBMB_MAG_2020_0490	604593.9	6222413.3	Large magnetic anomaly	153.2
BBMB_MAG_2020_0539	591340.5	6224562.9	Large magnetic anomaly	187.2
BBMB_MAG_2020_0573	599662.5	6225119.0	Large magnetic anomaly	184.4
BBMB_MAG_2020_0641	580169.8	6226874.6	Large magnetic anomaly	113.3
BBMB_MAG_2020_0699	578529.7	6227848.7	Large magnetic anomaly	196.9
BBMB_MAG_2020_0746	582389.2	6228864.8	Large magnetic anomaly	127.9
BBMB_MAG_2020_0804	597220.2	6230532.1	Large magnetic anomaly	151.8
BBMB_MAG_2020_0840	574666.3	6231715.7	Large magnetic anomaly	185.0
BBMB_MAG_2020_0898	577227.2	6233974.0	Large magnetic anomaly	123.4
BBMB_MAG_2020_0910	592792.3	6234250.9	Large magnetic anomaly	192.8
BBMB_MAG_2020_0939	596732.0	6235152.1	Large magnetic anomaly	170.7
BBMB_MAG_2020_0941	576960.3	6235247.3	Large magnetic anomaly	100.2
BBMB_MAG_2020_0970	584402.4	6235925.4	Large magnetic anomaly	153.4
BBMB_MAG_2020_0984	580588.1	6236400.7	Large magnetic anomaly	106.2
BBMB_MAG_2020_1045	574541.8	6238218.9	Large magnetic anomaly	174.4
BBMB_MAG_2020_1058	588195.4	6238944.5	Large magnetic anomaly	177.0
BBMB_MAG_2020_1113	568747.9	6240431.0	Large magnetic anomaly	109.6
BBMB_MAG_2020_1154	589393.7	6241352.0	Large magnetic anomaly	199.1
BBMB_MAG_2020_1191	592731.8	6242247.2	Large magnetic anomaly	104.8
BBMB_MAG_2020_1197	597171.6	6242353.2	Large magnetic anomaly	111.6
BBMB_MAG_2020_1208	587019.5	6242568.2	Large magnetic anomaly	126.2
BBMB_MAG_2020_1334	562339.4	6246166.9	Large magnetic anomaly	109.8
BBMB_MAG_2020_1340	591337.7	6246301.0	Large magnetic anomaly	119.3
BBMB_MAG_2020_1345	574353.7	6246527.9	Large magnetic anomaly	136.0
BBMB_MAG_2020_1370	583795.3	6247599.7	Large magnetic anomaly	112.4
BBMB_MAG_2020_1378	587576.3	6247840.8	Large magnetic anomaly	192.6
BBMB_MAG_2020_1414	563315.8	6248523.7	Large magnetic anomaly	164.3
BBMB_MAG_2020_1435	592768.0	6248847.2	Large magnetic anomaly	102.3
BBMB_MAG_2020_1491	570954.1	6250309.5	Large magnetic anomaly	109.4
BBMB_MAG_2020_1576	572374.0	6252798.6	Large magnetic anomaly	104.6
BBMB_MAG_2020_1580	576140.8	6252951.6	Large magnetic anomaly	103.5
BBMB_MAG_2020_1588	579115.0	6253158.6	Large magnetic anomaly	132.9
BBMB_MAG_2020_1712	566840.2	6257095.1	Large magnetic anomaly	124.9
BBMB_MAG_2020_1721	577550.1	6257393.1	Large magnetic anomaly	156.4
BBMB_MAG_2020_1776	570002.1	6258979.5	Large magnetic anomaly	108.7
BBMB_MAG_2020_1779	586273.6	6259021.6	Large magnetic anomaly	125.0
BBMB_MAG_2020_1808	585889.3	6259951.0	Large magnetic anomaly	140.3
BBMB_MAG_2020_0011	546796.5	6204343.6	Large magnetic anomaly	230.0
BBMB_MAG_2020_0031	555524.8	6208744.3	Large magnetic anomaly	293.0
BBMB_MAG_2020_0035	556890.4	6210024.7	Linear feature	1794.3

Anomaly ID	X	Y	Description	Intensity (nT)
BBMB_MAG_2020_0036	556982.9	6210033.3	Linear feature	2175.3
BBMB_MAG_2020_0037	557259.4	6210040.6	Linear feature	2379.7
BBMB_MAG_2020_0038	556810.2	6210042.4	Linear feature	2863.7
BBMB_MAG_2020_0039	556639.3	6210064.8	Linear feature	1747.9
BBMB_MAG_2020_0040	556513.9	6210083.3	Linear feature	2363.0
BBMB_MAG_2020_0041	556568.3	6210083.8	Linear feature	2338.2
BBMB_MAG_2020_0046	557712.8	6211700.7	Linear feature	1613.1
BBMB_MAG_2020_0047	557792.5	6211723.9	Linear feature	5417.9
BBMB_MAG_2020_0048	557906.3	6211751.9	Linear feature	4795.5
BBMB_MAG_2020_0050	558128.5	6211809.5	Linear feature	2178.2
BBMB_MAG_2020_0051	557840.5	6211867.2	Linear feature	538.1
BBMB_MAG_2020_0052	558205.8	6211910.9	Linear feature	3007.7
BBMB_MAG_2020_0053	558034.2	6211926.6	Linear feature	1000.3
BBMB_MAG_2020_0054	558407.8	6211936.8	Linear feature	1754.2
BBMB_MAG_2020_0055	558316.3	6211937.2	Linear feature	2549.6
BBMB_MAG_2020_0056	558335.2	6211937.6	Linear feature	2549.6
BBMB_MAG_2020_0057	558709.8	6211983.0	Linear feature	1947.6
BBMB_MAG_2020_0060	559732.3	6213952.4	Linear feature	1812.8
BBMB_MAG_2020_0061	559429.2	6214001.0	Linear feature	4456.0
BBMB_MAG_2020_0062	559511.4	6214003.2	Linear feature	3085.0
BBMB_MAG_2020_0063	559601.8	6214007.7	Linear feature	3101.6
BBMB_MAG_2020_0064	559804.0	6214047.3	Linear feature	1812.8
BBMB_MAG_2020_0066	560000.0	6214053.0	Linear feature	348.4
BBMB_MAG_2020_0067	559941.0	6214060.0	Linear feature	391.4
BBMB_MAG_2020_0070	559764.9	6214340.0	Linear feature	314.8
BBMB_MAG_2020_0071	559872.0	6214364.0	Linear feature	549.6
BBMB_MAG_2020_0072	560065.0	6214392.0	Linear feature	373.9
BBMB_MAG_2020_0073	560165.1	6214421.9	Linear feature	506.7
BBMB_MAG_2020_0074	560215.1	6214428.5	Linear feature	582.0
BBMB_MAG_2020_0075	560546.6	6214431.7	Linear feature	229.9
BBMB_MAG_2020_0076	560288.6	6214436.0	Linear feature	651.0
BBMB_MAG_2020_0077	560214.0	6214816.0	Linear feature	1134.4
BBMB_MAG_2020_0078	560127.5	6214823.0	Linear feature	657.1
BBMB_MAG_2020_0079	560472.0	6214836.0	Linear feature	1614.0
BBMB_MAG_2020_0080	560522.2	6214839.1	Linear feature	1464.7
BBMB_MAG_2020_0081	560062.0	6214844.4	Linear feature	1946.4
BBMB_MAG_2020_0082	560594.0	6214848.0	Linear feature	1938.8
BBMB_MAG_2020_0083	560409.0	6214849.0	Linear feature	1147.2
BBMB_MAG_2020_0084	560886.3	6214886.4	Linear feature	2029.1
BBMB_MAG_2020_0085	560602.8	6215006.9	Linear feature	440.3
BBMB_MAG_2020_0086	560195.7	6215023.6	Linear feature	1762.7
BBMB_MAG_2020_0087	560665.7	6215029.0	Linear feature	440.3
BBMB_MAG_2020_0088	560745.1	6215052.3	Linear feature	1767.8
BBMB_MAG_2020_0089	560577.5	6215078.7	Linear feature	1821.6
BBMB_MAG_2020_0090	560415.2	6215081.3	Linear feature	1988.1
BBMB_MAG_2020_0091	560327.0	6215089.0	Linear feature	2079.9
BBMB_MAG_2020_0092	561066.6	6215128.5	Linear feature	1334.8
BBMB_MAG_2020_0093	560628.2	6215489.5	Linear feature	389.2
BBMB_MAG_2020_0094	560546.0	6215498.0	Linear feature	235.1
BBMB_MAG_2020_0095	560746.1	6215522.9	Linear feature	473.1
BBMB_MAG_2020_0096	560960.9	6215592.4	Linear feature	411.6
BBMB_MAG_2020_0098	561106.4	6215615.3	Linear feature	209.9
BBMB_MAG_2020_0099	561176.1	6215630.8	Linear feature	454.2
BBMB_MAG_2020_0100	561480.5	6215683.1	Linear feature	1008.3

Anomaly ID	X	Y	Description	Intensity (nT)
BBMB_MAG_2020_0105	563292.7	6217469.7	Large magnetic anomaly	213.1
BBMB_MAG_2020_0214	568522.5	6219049.4	Large magnetic anomaly	297.7
BBMB_MAG_2020_0334	590166.8	6223181.8	Large magnetic anomaly	325.4
BBMB_MAG_2020_0385	576045.2	6225921.9	Large magnetic anomaly	200.9
BBMB_MAG_2020_0767	573822.0	6229466.2	Large magnetic anomaly	696.0
BBMB_MAG_2020_0787	594994.5	6229788.7	Large magnetic anomaly	270.8
BBMB_MAG_2020_0823	591577.9	6231208.8	Large magnetic anomaly	333.9
BBMB_MAG_2020_0832	581238.8	6231391.0	Large magnetic anomaly	385.8
BBMB_MAG_2020_0989	591433.9	6236617.0	Large magnetic anomaly	460.1
BBMB_MAG_2020_1096	595750.7	6239832.0	Large magnetic anomaly	204.6
BBMB_MAG_2020_1167	571949.7	6241577.2	Large magnetic anomaly	211.2
BBMB_MAG_2020_1238	601471.2	6243420.6	Large magnetic anomaly	253.5
BBMB_MAG_2020_1270	590310.0	6244516.7	Large magnetic anomaly	224.1
BBMB_MAG_2020_1290	601058.1	6245022.5	Large magnetic anomaly	697.5
BBMB_MAG_2020_1407	563361.7	6248405.1	Large magnetic anomaly	507.9
BBMB_MAG_2020_1603	597905.2	6253364.0	Large magnetic anomaly	213.3
BBMB_MAG_2020_1705	563320.4	6256858.7	Large magnetic anomaly	319.7
BBMB_MAG_2020_1732	567549.2	6257609.2	Large magnetic anomaly	257.3
BBMB_MAG_2020_1737	568058.1	6257846.2	Large magnetic anomaly	276.7
BBMB_MAG_2020_1826	586377.3	6260974.4	Large magnetic anomaly	547.7
BBMB_MAG_2020_1880	571914.7	6263993.3	Large magnetic anomaly	386.2

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