Neart na Gaoithe

Offshore Written Scheme of Investigation & Protocol for Archaeological Discoveries

Revision 3.0

July 2020

DOCUMENT REFERENCE: NNG-NNG-ECF-PLN-0005

Neart na Gaoithe Offshore Wind Farm

Offshore WSI & PAD

Pursuant to Section 36 Consent Condition 28 and the Marine Licence (Offshore Transmission Works) Condition 3.2.2.22

For the approval of the Scottish Ministers

Document Control

SIGN OFF		
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Sarah MacNab Environmental Clerk of Works	[Redacted]	17/07/20

Plan Overview

Purpose and Objectives of the Plan

This Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD), has been prepared to address the specific requirements of the relevant conditions attached to the Section 36 (S36) consent and Marine Licences (collectively referred to as the Offshore Consents) issued to Neart na Gaoithe Offshore Wind Limited (NnGOWL).

Scope of the Plan

In line with the requirements of the Offshore Consents, this Plan sets out the protocol to be followed by NnGOWL and its Contractors on discovery of any marine archaeology. In addition, it sets out a Written Scheme of Investigation that aims to mitigate potential effects on all known and potential archaeological features within the Project area.

Structure of the Plan

Sections 1 and 2 set out the scope and objectives of the WSI and PAD and present the background to the Project.

Section 3 details the roles and responsibilities and lines of communication for the Project as relevant to archaeology.

Section 4 is the full WSI as is relevant to the Project.

Section 5 provides the full details of the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD).

Section 6 details the compliance measures that will be undertaken in line with the Application.

Plan Audience

The Offshore WSI & PAD is intended to confirm to the Scottish Ministers that the Offshore Consents are being complied with.

The Offshore WSI & PAD will be referred to by personnel involved in the design and construction of the Project, including NnGOWL personnel and Contractors.

Compliance with this Offshore WSI & PAD will be monitored internally by the NnGOWL Consents team supported by the NnGOWL's Environmental Clerk of Works (ECoW), and externally by the Marine Scotland Licensing Operations Team (MS-LOT).

Plan Locations

Copies of this Offshore WSI & PAD are to be held in the following locations:

- NnGOWL Project Office;
- The Marine Coordination Centre; and

With NnGOWL's Retained Archaeologist and ECoW.

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Acronyms and Abbreviations

TERM	DESCRIPTION
AC	Alternating Current
ADS	Archaeological Data Service
AEZ	Archaeological Exclusion Zone
CES	Crown Estate Scotland
CIfA	Chartered Institute for Archaeologists
COWRIE	Collaborative Offshore Wind Research into the Environment
EIA	Environmental Impact Assessment
ELCAS	East Lothian Council Archaeology Service
ES	Environmental Statement
HER	Historic Environment Record
HES	Historic Environment Scotland
JCCC	Joint Casualty and Compassionate Centre
JNAPC	Joint Nautical Archaeology Policy Committee Code of Practice for Development
MEDIN	Marine Environment Data and Information Network
MoRPHE	Management of Research Projects in the Historic Environment
MARP	Marine Archaeology Reporting Protocol (represented by current best-practice mechanism ORPAD)
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MoD	Ministry of Defence
NnGOWL	Neart na Gaoithe Offshore Wind Limited
OfTW	Offshore Transmission Works
O&M	Operation and Maintenance
ORPAD	Offshore Renewables Protocol for Archaeological Discoveries
OSP	Offshore Substation Platform
PAD	Protocol for Archaeological Discoveries
TCE	The Crown Estate
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
ROV	Remotely Operated Vehicle
WA	Wessex Archaeology
WSI	Written Scheme of Investigation

Defined Terms

TERM	DESCRIPTION
Addendum	The Addendum of Additional Information submitted to the Scottish Ministers by NnGOWL on 26 July 2018.
Application	The Environmental Impact Assessment Report, Habitats Regulations Appraisal Report submitted to the Scottish Ministers by NnGOWL on 16 March 2018; the Addendum of Additional Information submitted to the Scottish Ministers by NnGOWL on 26 July 2018 and the Section 36 Consent Variation Report dated 08 January 2019.
Company	Neart na Gaoithe Offshore Wind Limited (NnGOWL) (Company Number SC356223). NnGOWL has been established to develop, finance, construct, operate, maintain and decommission the Project.
Consent Conditions	The terms that are imposed on the Company under the Offshore Consents that must be complied with
Consent Plans	The plans, programmes or strategies required to be approved by the Scottish Ministers (in consultation with appropriate stakeholders) in order to discharge the Consent Conditions.
Contractors	Any Contractor/Supplier (individual or firm) working on the Project.
EIA Report	The Environmental Impact Assessment Report, dated March 2018, submitted to the Scottish Ministers by NnGOWL as part of the Application.
Inter-array Cables	The offshore cables connecting the wind turbines to one another and to the OSPs.
Interconnector Cables	The offshore cables connecting the OSPs to one another.
Marine Licences	The written consents granted by the Scottish Ministers under the Marine (Scotland) Act 2010, for construction works and deposits of substances or objects in the Scottish Marine Area in relation to the Wind Farm (Licence Number 06677/19/0) and the OfTW (Licence Number 06678/19/1), dated 4 June 2019 and 5 June 2019 respectively.
Offshore Consents	The Section 36 Consent and the Marine Licences.
Offshore Export Cable Corridor	The area within which the offshore export cables are to be located.
Offshore Export Cables	The offshore export cables connecting the OSPs to the landfall site.
OfTW	The Offshore Transmission Works comprising the OSPs, offshore interconnector cables and offshore export cables required to connect the Wind Farm to the Onshore Transmission Works at the landfall.
OfTW Area	The area outlined in red and blue in Figure 1 attached to Part 4 of the OfTW Marine Licence.
OnTW	The onshore transmission works from landfall and above Mean High Water Springs, consisting of onshore export cables and the onshore substation.
Project	The Wind Farm and the OfTW.
Section 36 Consent	The written consent granted on 3 December 2018 by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Wind Farm, as varied by the Scottish Ministers under section 36C of the Electricity Act 1989 on 4 June 2019.
Section 36 Consent Variation Report	The Section 36 Consent Variation Report submitted to the Scottish Ministers by NnGOWL as part of the Application as defined above on 08 January 2019.
Subcontractors	Any Contractor/Supplier (individual or firm) providing services to the Project, hired by the Contractors.
Wind Farm	The offshore array as assessed in the Application including wind turbines, their foundations and inter-array cabling.
Wind Farm Area	The area outlined in black in Figure 1 attached to the Section 36 Consent Annex 1, and the area outlined in red in Figure 1 attached to Part 4 of the Wind Farm Marine Licence.

Consent Plans

CONSENT PLAN	ABBREVIATION	DOCUMENT REFERENCE NUMBER
Decommissioning Programme	DP	NNG-NNG-ECF-PLN-0016
Construction Programme and Construction Method Statement	CoP and CMS	NNG-NNG-ECF-PLN-0002
Piling Strategy	PS	NNG-NNG-ECF-PLN-0011
Development Specification and Layout Plan	DSLP	NNG-NNG-ECF-PLN-0003
Design Statement	DS	NNG-NNG-ECF-PLN-0004
Environmental Management Plan	EMP	NNG-NNG-ECF-PLN-0006
Operation and Maintenance Programme	OMP	NNG-NNG-ECF-PLN-0012
Navigational Safety Plan and Vessel Management Plan	NSVMP	NNG-NNG-ECF-PLN-0010
Emergency Response Cooperation Plan	ERCoP	NNG-NNG-ECF-PLN-0015
Cable Plan	CaP	NNG-NNG-ECF-PLN-0007
Lighting and Marking Plan	LMP	NNG-NNG-ECF-PLN-0009
Project Environmental Monitoring Programme	PEMP	NNG-NNG-ECF-PLN-0013
Fisheries Management and Mitigation Strategy	FMMS	NNG-NNG-ECF-PLN-0008
Offshore Written Scheme of Investigation and Protocol for Archaeological Discoveries	WSI & PAD	NNG-NNG-ECF-PLN-0005
Construction Traffic Management Plan	CTMP	NNG-NNG-ECF-PLN-0014

1 Introduction

1.1 Background

1. The Neart na Gaoithe Offshore Wind Farm (Revised Design) received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 03 December 2018 and was granted two Marine Licences by the Scottish Ministers, for the Wind Farm and the associated Offshore Transmission Works (OfTW), on 03 December 2018. The S36 consent and Wind Farm Marine Licence were revised by issue of a variation to the S36 Consent and Marine Licence 06677/19/0 on 4 June 2019, and the OfTW Marine Licence by the issue of Marine Licence 06678/19/1 on the 5 June 2019. The revised S36 Consent and associated Marine Licences are collectively referred to as 'the Offshore Consents'.

2. The Project is being developed by Neart na Gaoithe Offshore Wind Limited (NnGOWL).

1.2 Objectives of this Document

3. The Offshore Consents contain a variety of conditions that must be discharged prior to the commencement of any offshore construction works. One such requirement is for the submission to the Scottish Ministers of a Marine Archaeology Reporting Protocol (MARP) for approval.

4. The relevant conditions setting out the requirement for a MARP are set out in full in Table 1-1 below. This document is intended to fully satisfy the requirements of the S36 and the OfTW Marine Licence conditions by providing a protocol to be followed in light of any archaeological discoveries (referred to hereafter as the Protocol for Archaeological Discoveries ['PAD'] to align with recognised terminology[1]). Further to consent requirements, this document also includes a Written Scheme of Investigation (WSI), which sets out mitigation procedures that seek to avoid, reduce or off-set impact upon known and potential archaeology and cultural heritage assets as a result of the project in order to safeguard the archaeological and historic environment resource. It is logical that the PAD and WSI sit together as one document.

Table 1-1-1 Consent conditions to be discharged by this WSI & PAD

CONSENT DOCUMENT	CONDITION TEXT	WHERE ADDRESSED
Section 36 Consent **Condition 28**	The Company must, no later than six months prior to the Commencement of the Development, submit a Marine Archaeology Reporting Protocol ("MARP") which sets out what the Company must do on discovering any marine archaeology during the construction, operation, maintenance and monitoring of the Development, in writing, to the Scottish Ministers for their written approval.	This document sets out the Written Scheme of Investigation (including the Protocol for Archaeological Discoveries) for approval by the Scottish Ministers
	Such approval may be given only following consultation by the Scottish Ministers with Historic Environment Scotland ("HES") and any such advisors as may be required at the discretion of the Scottish Ministers.	Consultation to be undertaken by the Scottish Ministers

[1] The Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) sets out industry best-practice and will be adhered to by NnGOWL and its Contractors. OPRAD is available here: https://www.wessexarch.co.uk/our-work/offshore-renewables-protocol-archaeological-discoveries. In the case of this Consent Plan, the term MARP as used in the Offshore Consents, has been replaced by PAD, as recognised by the offshore renewables industry.

CONSENT DOCUMENT	CONDITION TEXT	WHERE ADDRESSED
	The Reporting Protocol must be implemented in full, at all times, by the Company.	Reporting Protocol (PAD) provided in Section 5 for approval by the Scottish Ministers
OFTW Marine Licence Condition 3.2.2.22	The Licensee must, no later than six months prior to the Commencement of the Works, submit a Marine Archaeology Reporting Protocol ("MARP") which sets out what the Licensee must do on discovering any marine archaeology during the construction, operation, maintenance and monitoring of the Works, in writing, to the Licensing Authority for their written approval.	This document sets out the Written Scheme of Investigation (including the Protocol for Archaeological Discoveries) for approval by the Scottish Ministers
	Such approval may be given only following consultation by the Licensing Authority with Historic Environment Scotland and any such advisors as may be required at the discretion of the Licensing Authority. Commencement of the Works may not take place until such approval is granted.	Consultation to be undertaken by the Scottish Ministers
	The MARP must be implemented in full, at all times, by the Licensee.	Reporting Protocol (PAD) provided in Section 5 for approval by the Scottish Ministers

5. In format and content, the WSI conforms to current UK best practice and to the guidance outlined in Management of Research Projects in the Historic Environment (MoRPHE, Historic England 2015a), the Joint Nautical Archaeology Policy Committee Code of Practice for Development (JNAPC 2006) and the relevant guidance from the Chartered Institute for Archaeologists (CIfA) (CIfA 2014a-g), as applicable. The PAD conforms to the best practice principles set out in the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) (The Crown Estate, 2014) which also embeds conformance with UK marine legislation with direct relevance to marine cultural heritage, including the Merchant Shipping Act 1995 and Protection of Military Remains Act 1986.

6. This includes consideration of archaeology and cultural heritage offshore, up to the Mean High Water Springs (MHWS). Archaeological and cultural heritage considerations with respect to onshore and intertidal works are considered as part of the onshore planning consent and are not within the scope of this document. A separate WSI covers the onshore development to Mean Low Water Springs (MLWS) and includes a consideration of intertidal heritage assets. As part of these mitigation procedures, the implementation of a PAD achieved through the application of ORPAD is proposed.

7. This WSI and PAD will be implemented at all stages of the development process where there is potential for effects on archaeology and where archaeological information may be obtained, spanning the lifespan of the Project (pre-construction, construction, operation and decommissioning).

8. The objectives of this WSI and PAD are as follows:

- To set out the respective responsibilities of NnGOWL, main contractors, and archaeological contractors/consultants prior to and during installation, to include contact details and formal lines of communication between the parties and with Archaeological Curator(s);
- To ensure that any further geophysical and geotechnical investigations or other relevant surveys associated with the Project are subject to archaeological input, review, recording and sampling;
- To provide the exact position and extent of archaeological exclusion zones, and establish methods for their monitoring, modification and/or removal;

- To propose measures for mitigating effects upon any archaeological material that may be encountered during the operations associated with the project (i.e. the Protocol for Archaeological Discoveries); and
- To establish the reporting, publication, conservation and archiving requirements for the archaeological works undertaken in the course of the Project.

9. This document will be updated as necessary to take account of any changes in Project design and/or changes in understanding of the archaeological baseline.

1.3 WSI & PAD Document Structure

10. In response to the specific requirements of the conditions attached to the Offshore Consents, this WSI & PAD has been structured so as to be clear that each part of the specific requirements have been met and that the relevant information to allow the Scottish Ministers to approve the WSI & PAD has been provided. The document structure is set out in **Table 1-2** below.

Table 1-2 WSI & PAD document structure

SECTION		SUMMARY OF CONTENT
1	Introduction	Background to consent requirements and overview of the WSI and PAD scope and structure.
2	Project Overview	Provides an overview of the Project.
3	Roles, Responsibilities & Communication	Identification of key roles in the implementation of the WSI and PAD, and their responsibilities.
4	Written Scheme of Investigation	Describes the current known archaeological baseline and the potential impacts of the Project upon it. Presents mitigation to minimise potential impacts, including Archaeological Exclusion Zones (AEZs) and mitigation in the instance of unexpected discoveries.
5	Protocol for Archaeological Discoveries	Details on the implementation of The Crown Estates' Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) operated by Wessex Archaeology Ltd.
6	Compliance with the Application	Summarises how the WSI and PAD has been prepared in compliance with the Application

2 Project Overview

11. The Wind Farm Area is located to the northeast of the Firth of Forth, 15.5 km directly east of Fife Ness on the east coast of Scotland (Figure 2-1). The Wind Farm Area covers approximately 105 km2. Offshore Export Cables will be located within the 300 m wide Offshore Export Cable Corridor, running in an approximately southwest direction from the Wind Farm Area, making landfall at Thorntonloch beach to the south of Torness Power Station in East Lothian. Figure 2-1 shows the Wind Farm Area and Offshore Export Cable Corridor.

12. The Offshore Consents allow for the construction and operation of the following main components, which together comprise the Project:

- 54 wind turbines generating a maximum generating output of around 450 Megawatts (MW);
- 54 jacket substructures installed on pre-piled foundations, to support the wind turbines;
- Two alternating current (AC) substation platforms, referred to as Offshore Substation Platforms (OSPs), to collect the generated electricity and transform the electricity from 66kV to 220 kV for transmission to shore;
- Two jacket substructures installed on piled foundations, to support the OSPs;
- A network of inter-array subsea cables, buried and/or mechanically protected, to connect strings of turbines together and to connect the turbines to the OSPs;
- One interconnector cable connecting the OSPs to each other;
- Two buried and/or mechanically protected subsea export cables to transmit the electricity from the OSPs to the landfall at Thorntonloch and connecting to the onshore buried export cables for transmission to the onshore substation and connection to the National Grid network; and
- Minor ancillary works such as the deployment of metocean buoys and permanent navigational marks.

13. It is currently anticipated that offshore construction will commence in Quarter 2 (Q2) 2020; further detail is provided in the Construction Programme and Construction Method Statement.

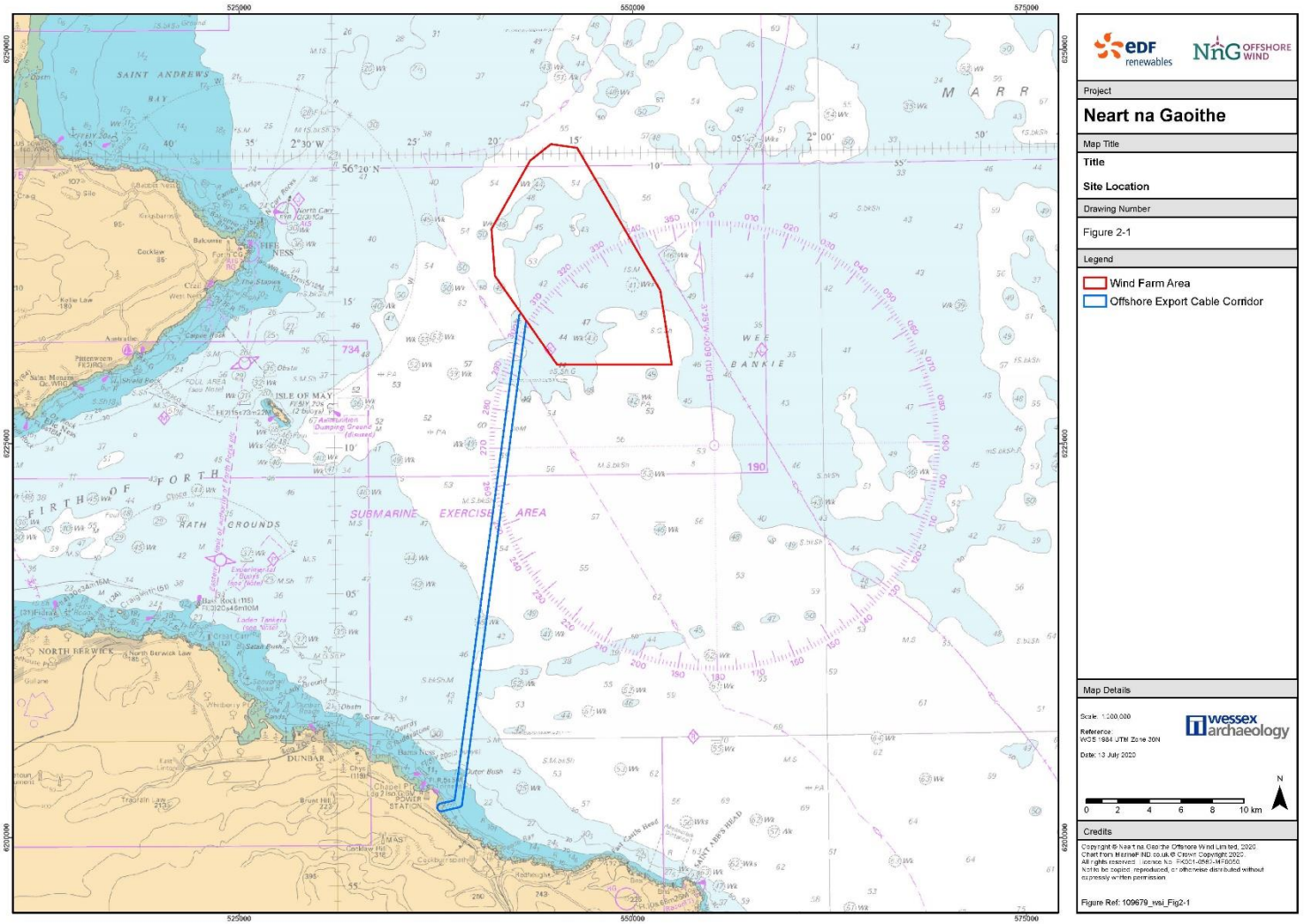


Figure 2-1 Project Overview

3 Roles, Responsibilities and Communication

3.1 NnGOWL

14. The responsibility for implementing this WSI and PAD rests with NnGOWL.

15. NnGOWL, or any archaeological body that they may appoint to manage the implementation of the WSI and PAD, will seek curatorial advice from Historic Environment Scotland (HES) and East Lothian Council Archaeology Service (ELCAS), defined as the Archaeological Curators. Interaction with the Archaeological Curators, and Marine Scotland (MS-LOT) will be administered by NnGOWL with advice where appropriate through the Retained Archaeologist.

3.2 Client Representative

16. NnGOWL will identify a Client Representative to act as a first point of contact for Project staff. It will be the responsibility of the Client Representative to liaise with the Environmental Clerk of Works (ECoW) in respect of the implementation of mitigation measures with respect to archaeology and cultural heritage. Overall responsibility for the implementation of this WSI and PAD lies with NnGOWL who will ensure that its agents and contractors are contractually bound to adhere to the terms of the WSI and to implement the PAD.

3.3 Environmental Clerk of Works

17. The ECoW is an independent representative who will be responsible for the liaison with the Retained Archaeologist and the Client Representative. The ECoW will be familiar with the requirements set out in the WSI and PAD and will provide oversight that agreed mitigation and reporting protocols are being followed.

3.4 Retained Archaeologist

18. NnGOWL will commission a Retained Archaeologist during the Project pre-construction, construction and Operation and Maintenance (O&M) phases. The Retained Archaeologist will oversee archaeological mitigation and be the initial point of contact for the ECoW.

19. The Retained Archaeologist will report to NnGOWL. The services provided by the Retained Archaeologist during the NnGOWL offshore pre-construction and construction phases are as follows:

- Maintaining, reviewing and updating this WSI, as required;
- Advising NnGOWL Contractor(s) which elements warrant archaeological involvement;
- Advising NnGOWL Contractor(s) in the course of evaluating scope of work specifications on their capacity to meet archaeological requirements;
- Advising NnGOWL on the necessary interaction with third parties with archaeological interests, including the Archaeological Curator(s);
- Advising NnGOWL on the implementation of generic archaeological requirements applicable to all construction and operational activities;
- Advising NnGOWL on Method Statements for archaeological investigations;
- Preparing detailed Method Statements for all archaeological activities;
- Ensuring that the NnGOWL copy Method Statements to the Archaeological Curator for approval;
- Monitoring the work of and liaising with the Archaeological Contractor(/s) where this is not the Retained Archaeologist;

- Monitoring the preparation and submission of Archaeological Reports as appropriate and making them available to the Archaeological Curator(s);
- Preparing provisions for the management of the project archives in consultation with an appropriate Museum; and
- Advising NnGOWL on final arrangements for analysis, archive deposition, publication and popular dissemination.

20. NnGOWL will ensure that the Retained Archaeologist is provided with all relevant project datasets, to ensure that they are in an informed position to advise the project team.

21. NnGOWL will consult the Retained Archaeologist during the planning stages for any further survey work. The Retained Archaeologist will advise NnGOWL and appropriate Contractor(s) on which elements warrant archaeological investigation. The Retained Archaeologist will advise NnGOWL on necessary interaction with third parties with archaeological interest, and the Archaeological Curator(s).

22. The Retained Archaeologist will provide archaeological advice at the planning stages for any further surveys, such as geophysical, geotechnical, Unexploded Ordnance (UXO), Remotely Operated Vehicle (ROV) or diver. The Retained Archaeologist will produce archaeological method statements for further archaeological investigations and will ensure approval from Archaeological Curator(s).

23. The Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) (The Crown Estate, 2014) sets out the protocols and procedures that must be followed in the event of any unexpected archaeological discoveries whilst undertaking this work.

24. The objectives of the ORPAD are as follows:

- Ensure that, in the event of unexpected archaeological discoveries being made, geophysical and geotechnical investigations are subject to archaeological input, review, recording and sampling; and
- Propose measures for mitigating effects upon any archaeological material that may be encountered during the operations associated with these investigations.

25. The Retained Archaeologist will act as the first contact for any unexpected archaeological discoveries. The Retained Archaeologist will cover the administration of the reporting of discoveries and provide immediate actions, including recording, handling and storage, and introduction of measures to prevent or reduce damage if the presence of a significant archaeological site is suspected. The Retained Archaeologist will then report any unexpected discoveries of archaeological material through the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD). NnGOWL will identify Nominated Contacts for the Protocol.

26. The Retained Archaeologist will liaise with any Contractor(s) prior to works being done to ensure that any unexpected archaeological discoveries are reviewed, recorded, sampled and reported in accordance with COWRIE (2007) guidelines for the collection and storage of geophysical and geotechnical data for archaeological assessment.

27. The Retained Archaeologist will produce reports for approval by NnGOWL and the Archaeological Curator(s). The Retained Archaeologist will also prepare project archives in consultation with the appropriate repository/ museum.

28. Conditions may vary on the ground, and this document may require amendment during the course of the work to reflect those variations. As such, this WSI will be regarded as a live document. Following consultation with Project and any other relevant parties, the Retained Archaeologist, will amend the WSI as necessary to reflect any change in methodology. Any changes will need to be approved by Marine Scotland and re-signed prior to works proceeding.

3.5 Archaeological Curator(s)

29. The Archaeological Curators for cultural heritage offshore are HES which is the statutory body for archaeology and heritage within Scotland, including marine archaeology in territorial waters adjacent to the Scottish coast up to the mean high water mark and to 200 nautical miles (nm) as advisors to MS-LOT as the licensing body for marine development.

30. In the event of a significant discovery, HES and MS-LOT will be informed of any archaeological or cultural heritage finds, and will as soon as reasonably practicable:

- Liaise with other relevant archaeological authorities;
- Advise on proposals to further evaluate any finds; and
- Advise on proposals to mitigate the effects of work activities upon any finds, if required.

31. The Archaeological Curator for heritage matters within the intertidal zone of Offshore Cable Route will be a representative of ELCAS.

32. The relevant contacts are:

- Philip Robertson, Head of Marine Team Historic Environment Scotland Longmore House Salisbury Place Edinburgh EH9 1S: Tel: 0131 668 8852 E-mail: HSHeritageManagementEIAandSEA@scotland.gsi.gov.uk
- Andrew Robertson, East Lothian Council Archaeology Service, John Muir House, Haddington, East Lothian, EH41 3HA Telephone: 01620 827039 E-mail:

  archaeology@eastlothian.gov.uk

33. Method statements for archaeological works will be submitted to the Archaeological Curator(s) for comment/approval one month prior to the planned commencement of surveys/works, in order to allow for sufficient time for the review and any amendments to be completed and agreed.

3.6 Contractors and Sub-Contractors

34. All Contractors engaged in the construction of the Project will:

- Familiarise themselves with the generic requirements of the WSI make them available to their staff;
- Communicate with the Retained Archaeologist in the planning stages of survey work, to ensure archaeological objectives are included, as appropriate;
- Obey legal obligations in respect of 'wreck' and 'treasure' under the Merchant Shipping Act 1995 and the Treasure Act 1996 respectively;
- Respect constraint maps and Archaeological Exclusion Zones;
- Assist and afford access to archaeologists employed by NnGOWL;
- Inform the Retained Archaeologist of any environmental constraint or matter relating to health, safety and welfare of which they are aware, that is relevant to the archaeologists' activities; and
- Implement the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) adopted by NnGOWL.

35. The responsibility for ensuring the implementation of ORPAD rests with NnGOWL, who will ensure that its Contractors are contractually bound to implement the protocol.

36. This WSI will form an integral part of NnGOWL environmental management procedures. This will ensure that agreed mitigation is wholly incorporated within all construction, operation and decommissioning plans and that all NnGOWL staff and their agents and contractors are bound to implement the terms of the WSI.

3.7 Archaeological Contractor(s)

37. Archaeological Contractor(s) may be appointed to carry out specific packages of work, for example works beyond the in-house capabilities of the Retained Archaeologist, or additional works, as required. The Archaeological Contractor(s) may be appointed by NnGOWL or their appointed representatives (the Client, the Retained Archaeologist or other contractors/ sub-contractors). In these instances, the Retained Archaeologist will have a coordinating role, ensuring works are specified, planned, undertaken and reported in accordance with this WSI.

4 Written Scheme of Investigation

4.1 Introduction

38. This updated WSI is based on an existing WSI produced by Headland Archaeology in 2014 (Headland Archaeology 2010, 2014) based on geophysical assessments by EMU (2010). A draft WSI was initially updated by Wessex Archaeology in 2017 (Wessex Archaeology 2017) and revisited in 2019 (NnGOWL 2019). Mitigation measures proposed in the 2014 mitigation strategy documents have been updated following review of geophysical surveys carried out in 2019 and 2020. The current baseline gazetteer information has been updated with the recent archaeological review of geophysical data and updated UKHO data (received 08/01/2016).

4.2 The Archaeological Assessment Areas

39. Positions are reported in Universal Transverse Mercator (UTM) Zone 30 North projected from a World Geodetic System (WGS) 1984 datum.

40. The area assessed in this report is defined by the extent of the proposed Project. The Study Area for this assessment is defined by a 300 x 300 m box around the Array and OSP locations, a 100 m corridor around the array cables and a 300 m wide corridor around the Export Cable Route.

41. The Study Area used for this assessment allows for the capture of relevant archaeological records that may have poor positional data, including for example historic wreck and aircraft losses, both of which are prevalent in this area.

4.3 Archaeological Baseline Summary

4.3.1 Introduction

42. This section provides a preliminary assessment of the known and potential archaeology in the Study Area. This review of the marine archaeological baseline resource was compiled based on the archaeological and historical data researched as part of the updated onshore and nearshore geotechnical site investigations (Fugro 2020), geophysical data (Wessex Archaeology 2020a) and the Technical Report (Wessex 2020b).

43. The full gazetteer of known archaeological and cultural heritage assets can be found in the Technical Report (Wessex Archaeology 2020b). Appendix A highlights those assets that have been recommended an Archaeological Exclusion Zone. The Gazetteer has been updated and synthesised with new UKHO data for the area and all previous marine archaeological assessments for the project.

44. The results have been presented in their survey acquisition zones within the Study Area. The site comprises eight separate zones (A, B, C, D, E, G, H). The export cables are split into the inshore (SKR_NS) nearshore (ECR_N), Mid shore (ECR_M), Offshore (ECR_O), and two corridors split between the two OSP locations (ECR_IF). Two additional areas were also acquired (VO06 and VO07) (Figure 4-1).

4.3.2 Previous Archaeological Work

45. A geoarchaeological report and WSI was produced by Headland Archaeology (2014). As part of an earlier WSI, a baseline assessment of the submerged prehistoric resource was undertaken for the Offshore Array (Wessex Archaeology 2017b) which included a review of previous geoarchaeological, and geophysical assessments undertaken in support of the Project (EMU 2010).

46. Wessex Archaeology has previously undertaken a number of assessments associated with NnG OWF, including:

- Written Scheme of Investigation (Mainstream Renewable Power 2017b);

- Stage 1 Geoarchaeological Review of Geotechnical Boreholes (Wessex Archaeology 2019);
- Offshore Written Scheme of Investigation & Protocol for Archaeological Discoveries (NnGOWL 2019);
- Archaeological assessment of marine geophysical data collected by Fugro (2019 and 2020) (Wessex Archaeology 2020a); and
- Marine Archaeological Technical Report (Wessex Archaeology 2020b).

47. Geotechnical surveys were carried out in January 2020 along the Export Cable Corridor, at the landfall and onshore (Fugro 2020). These geotechnical logs have been assessed as part of the baseline.

4.3.3 Summary of Known and Potential Archaeological Assets

4.3.3.1 Palaeographic Baseline

48. Within the study area, the Wee Bank Formation is overlain by post-glacial Holocene sediments including the St. Abbs Formation, the Largo Bay Member and the St. Andrews Bay Member. Within the Firth of Forth these formations are indicative of glacio-marine and estuarine environments. In particular, the St. Andrews Bay Member represents 'the build-up of accretionary banks in muddy tidal channels' (BGS, 1987) and is comprised of interbedded sand and clays in the west and pebbly muds and shelly sands in the east of the study area (EMU Ltd, 2010).

49. Seismic records for the study area show evidence of two palaeo-channels (Figure 4-2). These river valleys and marshlands may have presented an attractive and productive environment for Late Palaeolithic and Mesolithic human populations and evidence of their activity has some potential to be preserved within the sedimentary sequence of the study area: particularly in organic deposits such as peat. Because the shallow geology of much of the study area comprises till overlying bedrock there is only limited potential for the preservation of palaeoenvironmental remains, or for the occurrence of in situ archaeological sites and material.

50. A total of fifty-five borehole logs were reviewed as part of the Stage 1 works, with the aim of identifying deposits of potential geoarchaeological interest. Full details are included in Neart na Gaoithe Offshore Wind Farm Stage 1 geoarchaeological review of geotechnical boreholes (Wessex Archaeology, 2019).

51. The deposits recovered in fifty-five boreholes acquired from the Project agree with the expected stratigraphy of the area (Table 4-1).

Table 4-1 Stratigraphy of deposits expected to be present in Project

UNIT	FORMATION	AGE	DESCRIPTION	ARCHAEOLOGICAL POTENTIAL
4	Seabed Sediments	Recent	Muddy sand	Potential to comprise prehistoric archaeology low but may bury or protect features.
3b	Forth Formation: St Andrews Bay Member		Interbedded sands and clays in the west but pebbly muds and shelly sands in the east	Upper sediments may contain derived archaeological artefacts and preserve palaeoenvironmental indicators within
3a	Forth Formation: Largo Bay Member		Mud and silty muds in the Firth of Forth	

UNIT	FORMATION	AGE	DESCRIPTION	ARCHAEOLOGICAL POTENTIAL
		Late Weichselian to Early Holocene	which become coarser-grained and pebbly seawards	estuarine deposits. A high relative sea level during deposition of these units indicates preservation of in situ archaeological artefacts is unlikely.
3	Forth Formation (Undifferentiated)		Marine, glaciomarine and estuarine facies all recorded in this formation	
2	St Abbs Formation	Late Weichselian	Glaciomarine deposit, weakly laminated muds and silty muds with sporadic pebbles	Low archaeological potential as deposited in a glaciomarine environment.
1	Wee Bankie Formation	Weichselian	Glacial till. Sheet-like geometry but an uneven, ridged upper surface	Glacial till deposit therefore of low archaeological potential.

52. The lowermost Pleistocene deposit (Unit 1 or Unit 2) comprise glacial till or glaciomarine deposits which are expected to have been deposited during the last glacial period (Devensian) as ice sheets advanced from the Scottish Highlands, offshore into the central North Sea. Therefore, Unit 1 is considered to have low archaeological potential.

53. Overlying Unit 1 is a heterogenous deposit that collectively forms the Forth Formation (Unit 3). The depositional history of this unit is complex and likely reflects deposition in marine, glaciomarine and/or estuarine environments. Organic staining or patches have been recorded within this formation in four boreholes (WTG_032, WTG_066, WTG_068 and WTG_111). There is potential that this organic material, if present, was deposited in an estuarine setting during periods of lower sea level in the Early Holocene (Shennan et al. 2018) which would be of archaeological interest due to the potential to preserve paleoenvironmental material. These deposits have been assigned medium geoarchaeological potential which would typically warrant further Stage 2 geoarchaeological recording (Appendix 1). However, deposits from the depths of interest in these cores are disturbed bags samples and therefore considered unsuitable for further works.

54. Unit 4 is a sandy gravel or gravelly sand comprising shell fragments reflecting deposition in a modern marine environment. Occasionally, the presence of organic patches, staining or odour is recorded. Given its association with modern seabed sediments, this organic material is expected to be reworked and therefore unsuitable for further palaeoenvironment work. Consequently, Unit 4 has been assigned low geoarchaeological potential (Appendix 1).

55. A review of fifty-five borehole logs gathered in 2018/19 from the Wind Farm Area identified parts of Unit 3 as being of potential archaeological interest due to the presence of patches or fragments of organic material that may have been deposited in an estuarine environment during the Early Holocene. However, no undisturbed samples from this deposit were recovered during offshore operations, and the available disturbed samples are considered unsuitable for Stage 2 geoarchaeological recording. Therefore, no additional geoarchaeological works are recommended on the Project boreholes.

56. A geoarchaeological assessment was undertaken of nearshore and coastal onshore borehole logs (Fugro 2020). Quaternary sediments were recovered in the upper sections of the boreholes and comprised in situ or reworked coarse glacial sediments. No sediments of archaeological interest were recorded.

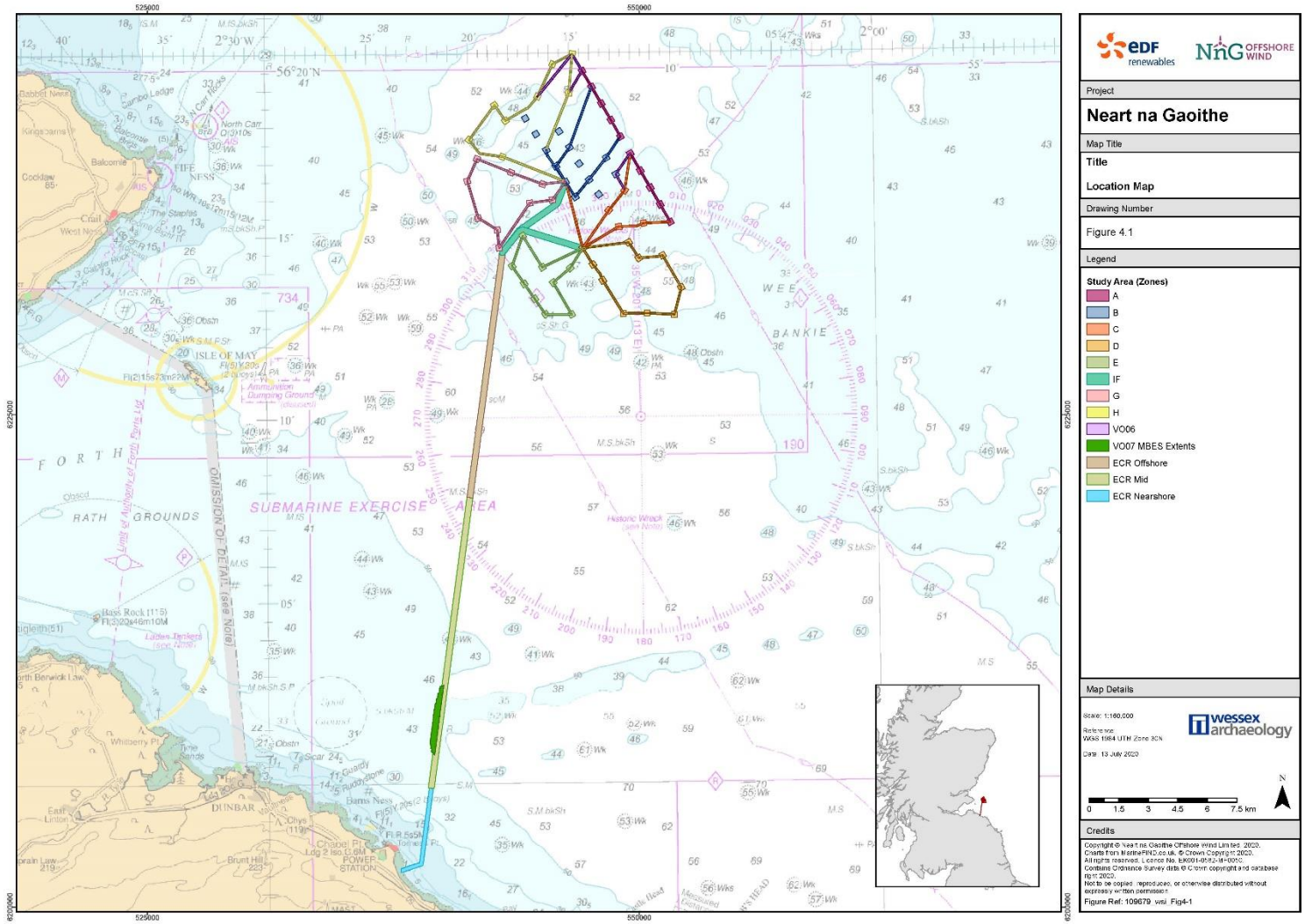


Figure 4-1 Location Map

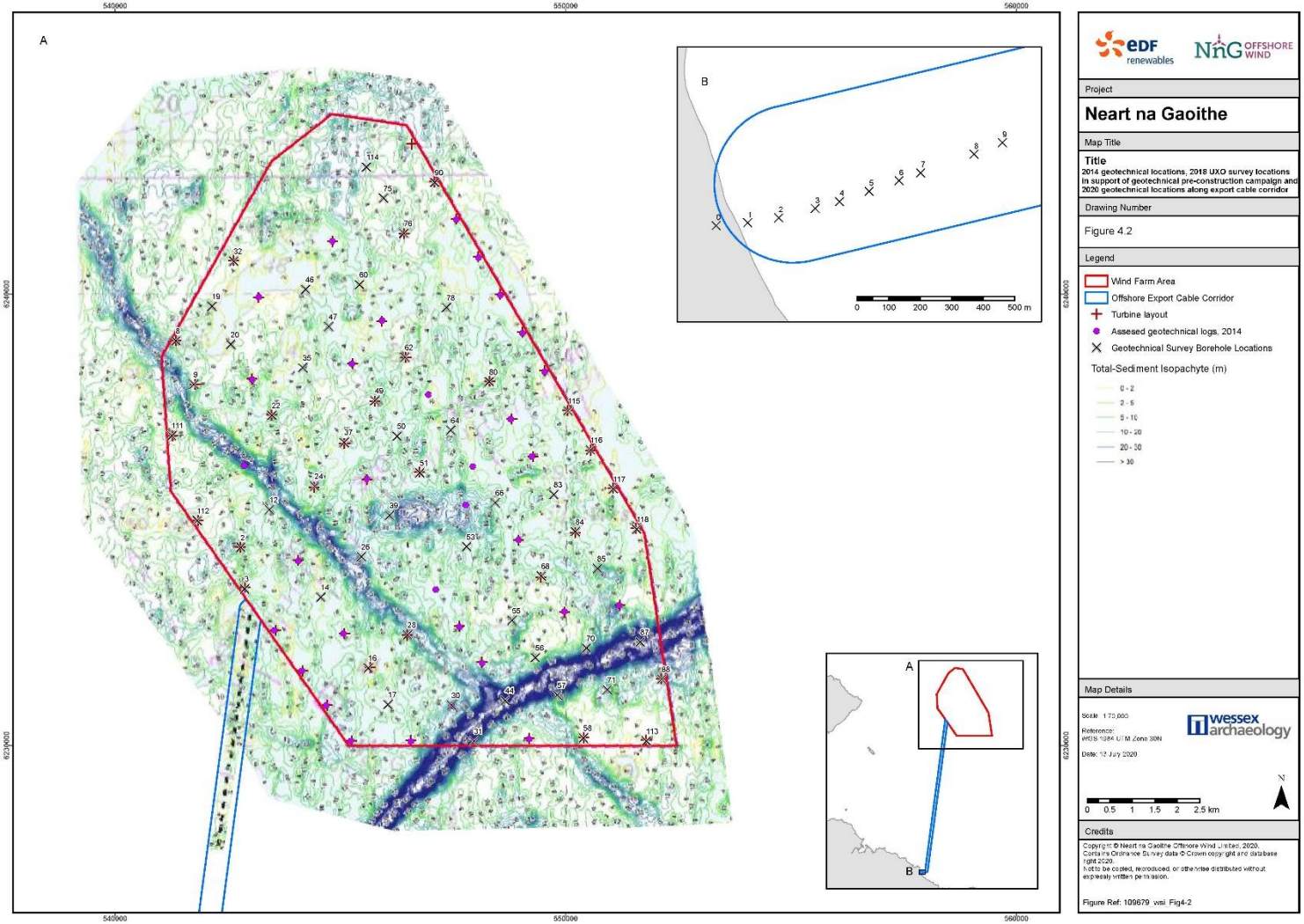


Figure 4-2 2014 geotechnical locations, 2018 UXO survey locations in support of geotechnical pre-construction campaign and 2020 geotechnical locations along export cable corridor

4.3.2.1 Seabed Features

57. There are currently two wrecks within the development area that are subject to statutory protection from the Protection of Military Remains Act 1986 Order 2006 (Designation of Vessels and Controlled Sites). K-4 and K-17 were K-class submarines that were wrecked during the First World War. 70144 (discussed below) is likely to be a section of one of these submarines and is located to the north of Zone C of the Study Area. The wrecks themselves are designated, so if 70144 is part of one of the wrecks it also falls under designation. Whilst the wreck itself is not in the Study Area, its AEZ lies adjacent to the Study Area.

58. A total of 846 anomalies were identified across the current Study Area. A total of 10 anomalies have been given an A1 archaeological discrimination, defined as features of anthropogenic origin of archaeological interest (Refer to Technical Report, 2020: Table 4). Of these 10 A1 anomalies, one has been classified as a wreck.

4.3.3.2.1 Wind Farm Area

59. Within Zone A, anomalies 70519 and 70520 have been discriminated as A1 (Figure 4-3). During ROV operations, items of possible archaeological interest, including a possible anchor and wooden object, were identified at these locations and interpreted as being part of a possible wreck site.

60. Anomaly 70144 located in Zone C has been discriminated as A1 (Figure 4-4). This has been classified as a wreck and is recorded in the UKHO database as one end of a possible submarine (UKHO 71166). The feature is situated out with the Study Area, however its 100 m Archaeological Exclusion Zone (AEZ) lies adjacent to the Study Area.

61. Anomaly 70075 is located within Zone D and has been discriminated as A1 (Figure 4-4). During ROV inspections this was found to be a possible feature of archaeological interest and is thought to be a sponson or float of an aircraft.

62. Within Zone E, five anomalies have been discriminated as A1 (70364 - 70368) (Figure 4-5). These are all identified within the same area of Zone E, and are part of two separate, but likely associated complex anomalies. No ROV inspections were undertaken at these locations as the AEZs falls out with the planned construction area.

4.3.3.2.2 Offshore Export Cable Corridor

63. Anomaly 71025 located in mid-shore export cable (ECR_M) has been discriminated as A1 (Figure 4-6). In the MBES data this is visible as a large, mounded feature with uneven height across its extent, measuring 16.9 x 11.0 x 11.0 m. The feature goes beyond the data extents and, as such, its dimensions should be considered a minimum. In the SSS data, this is identified as a spread of dark reflectors with height. The feature is outside of the magnetic data coverage and, as such, it is not possible to comment on whether it comprises ferrous material. The feature appears in line with, and similar in appearance to an area of geological outcropping and is possibly a natural feature. However, the feature was reported as being possible wreck debris during a previous geophysical assessment (EMU_Geophysics number_95) and is possibly associated with a UKHO record (2900) for a collapsed wreck. As such, the feature has been retained here as a precaution, but the possibility of this being a natural feature should be noted.

64. There is also one known 'Live' wreck from the SeaZone/UKHO records within the ECR_M which has been classified as an A3 anomaly (historic record of possible archaeological interest with no corresponding geophysical anomaly). 70747 was initially correlated with a site from the NMRS dataset which is located 350 m away (2000/2030). The potential for the discovery of unrecorded cultural heritage assets was regarded as low (Headland Archaeology 2014). During the 2020 geophysical assessment, nothing was identified at this position.

65. The remaining 806 anomalies have been given an A2, U2 or O3 discrimination. 758 anomalies have been assigned an A2 discrimination, defined as features of uncertain origin, but of possible archaeological interest. These discriminations were defined following review of data gathered in 2019/2020 during further investigations as part of UXO clearance works. These works were carried out on anomalies that overlap with the construction areas (section 4.5.2.5.1).

4.3.3.3 Maritime and Aviation Archaeological Potential

4.3.3.3.1 Maritime Potential

66. The potential for further discoveries draws on the results of the geophysical survey and desk-based research combined with further research of the wider area.

67. There is potential for discoveries of maritime craft from the Mesolithic to the modern period. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by UKHO and others, and thus recorded in the archaeological record. However, there is still potential for discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

68. This potential is highlighted through ROV operations discovering the possible remains of a wooden wreck (70519 and 70520) which has been reported via ORPAD (NnG_10865).

4.3.3.3.2 Aviation Potential

69. There is also potential for 20th century aircraft, particularly in relation to Second Wold War. Aircraft crash sites are also difficult to identify through archaeological assessments of geophysical survey, although past experience indicates material from the site, such as engines or other material may be recorded as small obstructions or anomalies.

70. This potential is highlighted through ROV operations discovering a possible sponson or float of a military aircraft (70075) which has been reported via ORPAD (NnG_10863).

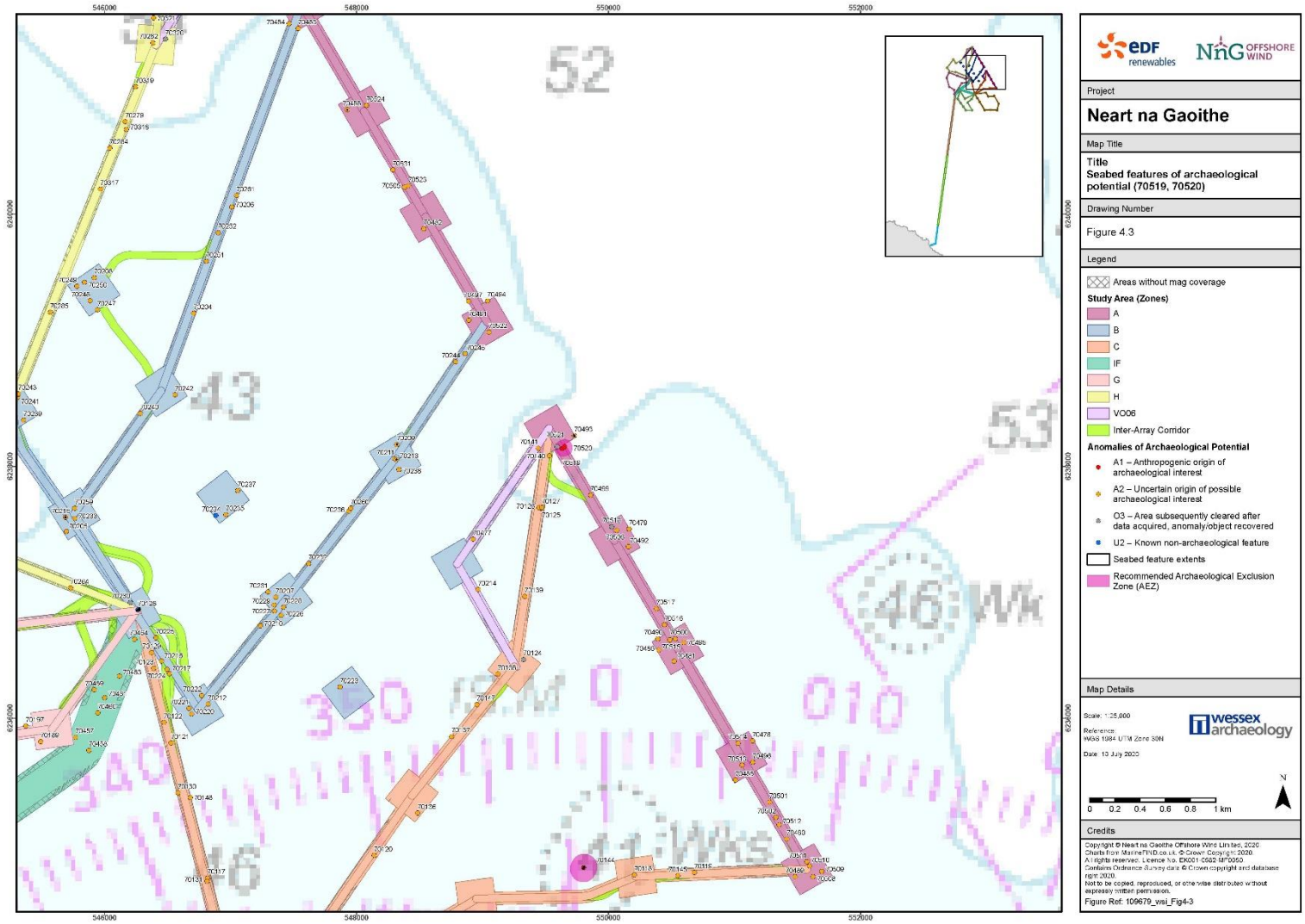


Figure 4-3 Seabed features of archaeological potential (70519, 70520)

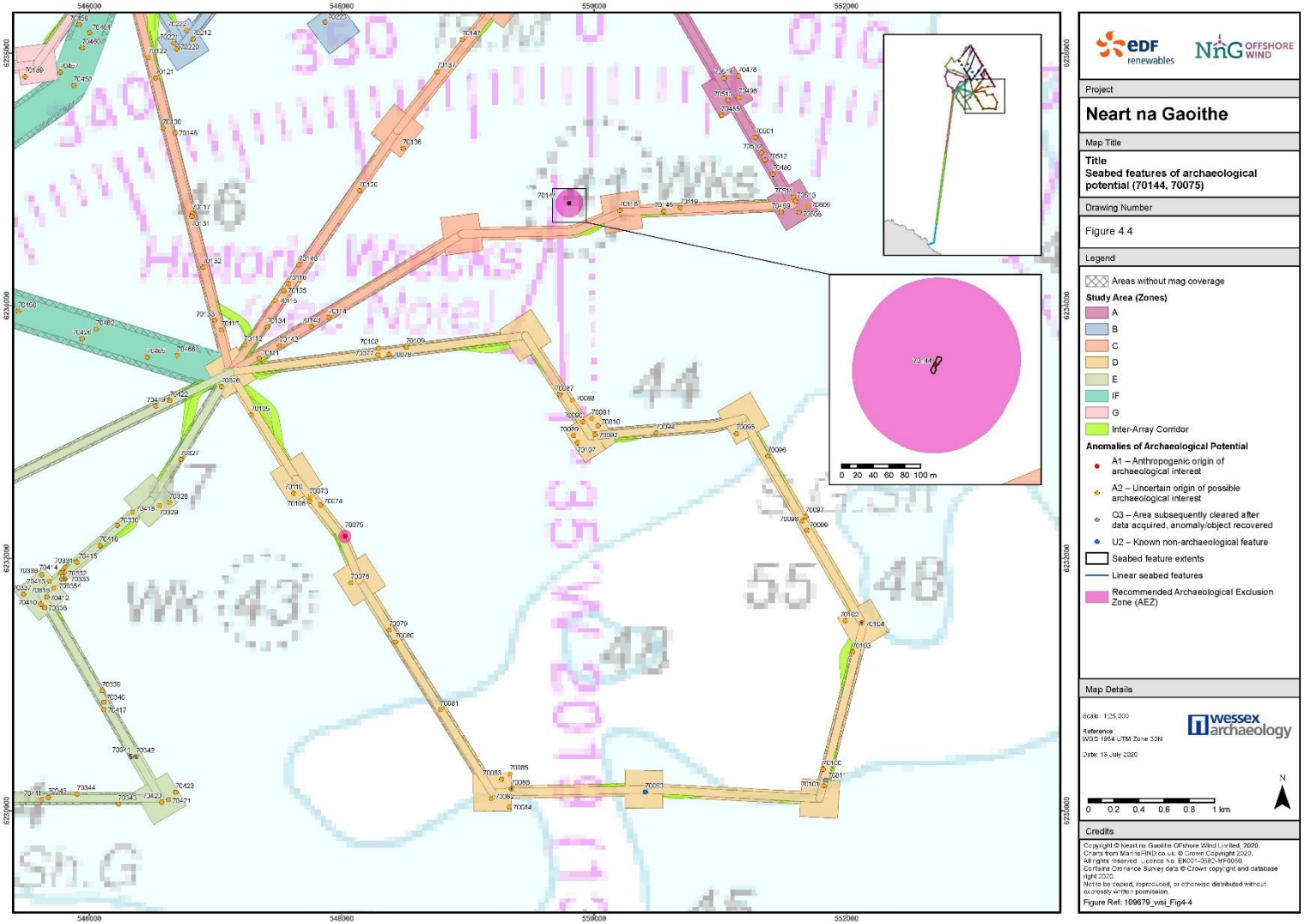


Figure 4-4 Seabed features of archaeological potential (70144, 70075)

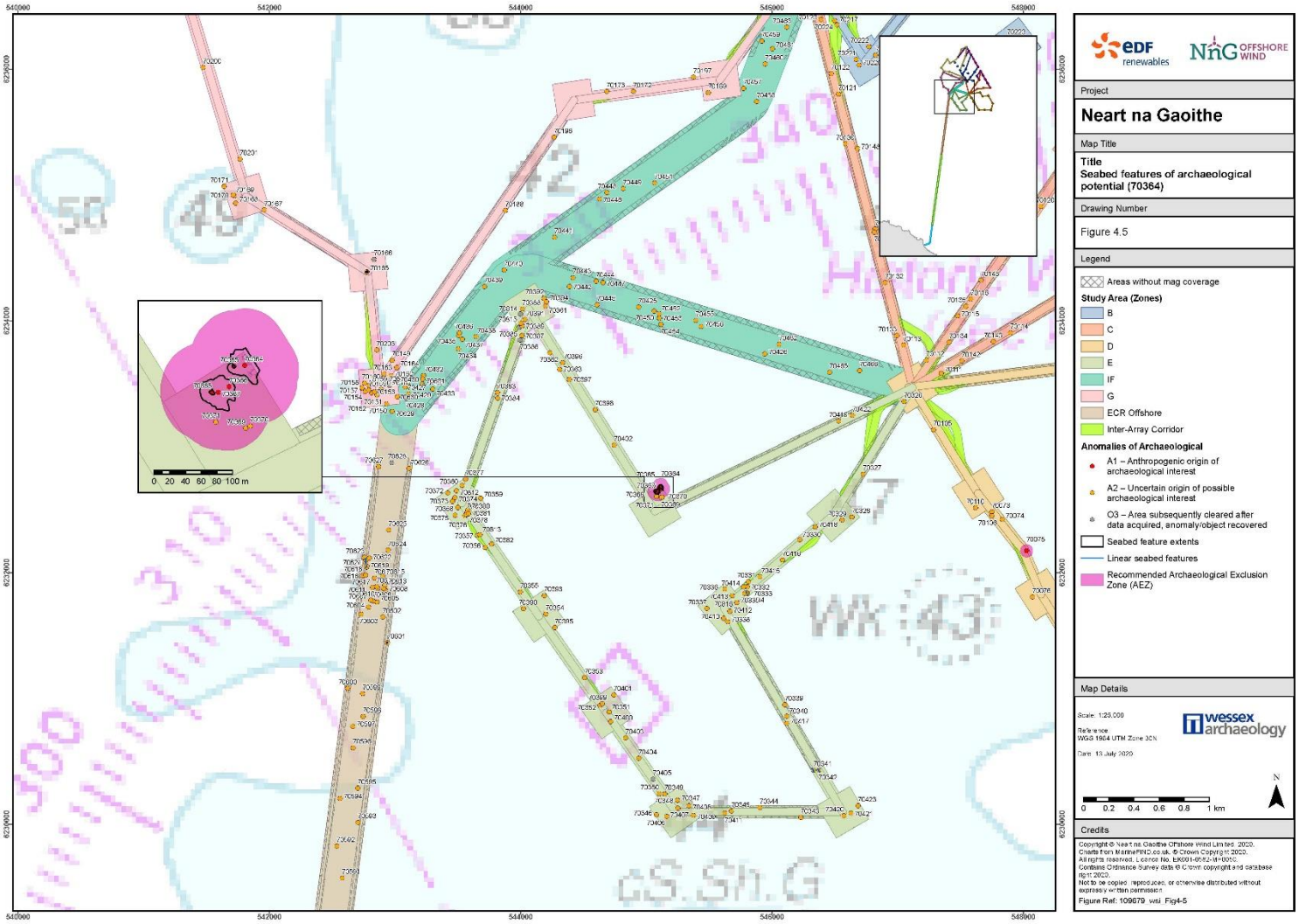


Figure 4-5 Seabed features of archaeological potential (70364)

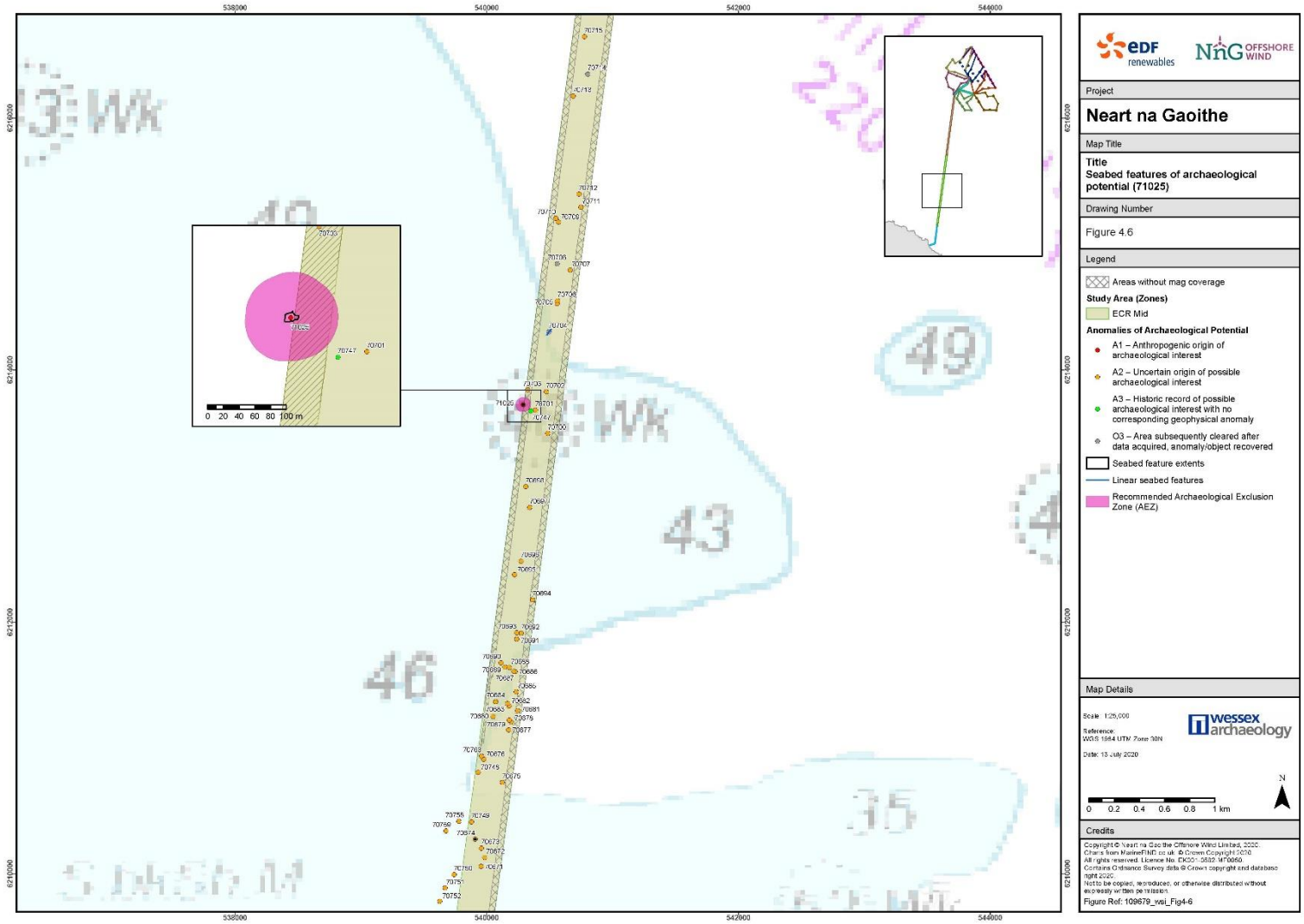


Figure 4-6 Seabed features of archaeological potential (71025)

4.4 Potential Impacts

4.4.1 Direct

71. Direct impacts include both direct damage to archaeological deposits and material and the disturbance or destruction of relationships between deposits and material and their wider surroundings.

72. Predicted direct impacts during construction comprise damage, disturbance or destruction of submerged prehistoric archaeology, shipwrecks and crashed aircraft from:

- Installation of pile foundations;
- Placing of scour and/or cable protection (if required);
- Installation of inter-array, interconnector and export cabling; and,
- Vessel interaction with the seabed (e.g. legs of jack-up vessels and/or anchors of other vessels).

73. Predicted direct impacts during the operation phase comprise damage, disturbance or destruction of the fabric or setting of submerged prehistoric archaeology, shipwrecks and crashed aircraft from:

- Anchors of vessels deployed during periodic overhauls and scheduled and unscheduled maintenance; and
- Legs of jack-up vessels in the event of turbine component replacement.

72. Predicted direct impacts during the decommissioning phase comprise damage, disturbance or destruction of the fabric or setting of submerged prehistoric archaeology, shipwrecks and crashed aircraft from:

- Removal of seabed infrastructure; and
- Legs of jack-up vessels and/or anchors of other vessels.

74. Assuming that work relating to the removal of foundations, scour protection or cables will be confined to an area of seabed already impacted by the Project, this impact may be regarded as an existing impact. If archaeological material is damaged, disturbed or destroyed as a result of previous impact, such effects will already have occurred as part of the construction phase.

4.4.2 Indirect

75. Indirect impacts can include changes to water quality, currents, sediment transport and erosion patterns during installation of foundations and cables. Possible indirect impacts comprise:

- Increased erosion to submerged prehistoric archaeology, shipwrecks and crashed aircraft uncovered as a result of changes in scour or sedimentation; and
- Increased protection afforded to submerged prehistoric archaeology, shipwrecks and crashed aircraft buried as a result of changes in scour or sedimentation.

76. No mitigation of indirect impacts is provided for in this WSI, as the potential for indirect physical impacts are judged to be negligible.

4.5 Mitigation

4.5.1 Introduction

77. The Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects (Crown Estate 2014) and COWRIE (Wessex Archaeology 2007) both put forward mitigation measures to avoid, offset or minimise the adverse effects of the development on underwater cultural heritage. NnGOWL will adopt the mitigation measures advised in this document.

78. The mitigation measures the Project will employ are summarised below. Should further data for the site be obtained as a result of updated reports or surveys, the mitigation measures detailed below may be subject to change.

4.5.2 Archaeological Exclusion Zones (AEZs)

4.5.2.1 Introduction

79. AEZs agreed between NnGOWL and the Archaeological Curators will be the principal means used to preserve in situ any sites or deposits of potential or known archaeological interest. In all cases, known cultural heritage receptors will be avoided.

80. AEZs are formed by establishing a buffer around the known extents of wreck sites, or around geophysical anomalies for which the available evidence suggests that there could be archaeological material present on the seabed. For sites and anomalies for which there is insufficient detailed information available to ascertain the site's archaeological importance, the AEZ will be implemented based on the potential apparent to the Retained Archaeologist (Crown Estate 2014).

4.5.2.2 Location and Extent of AEZs

81. AEZs are required for all known sites of high, medium and uncertain potential where the location of the archaeological receptor is known, or where the receptor has been at one time identified by geophysical/diver/ROV survey. AEZs are site-specific depending on the extent of the site or wreckage and are based on their archaeological potential.

82. All AEZs will be established in consultation with Historic Environment Scotland and will comprise a circular zone centred on the outline of each site. The radius of the zone will vary according to the vulnerability and archaeological potential of each site.

83. AEZs will apply to any activities that may disturb the seabed.

84. Twenty-three AEZs were proposed in the 2019 WSI (Table 4-2), in accordance with the EIA Report (March 2018). These AEZ have either been updated following on from the reviewed geophysical survey data.

Table 4-2 Marine Archaeological Receptors adapted from Headland Archaeology

WA_ID	Definition	Status/Potential	AEZs	Easting	Northing	Zone	Updated post-review
2001	Geophysical anomaly (EMU_Geophysics number_384)	high	100 m	541684	6238903	Zone H	No overlap with infrastructure – not further inspected
2002	Wreck (UKHO 2984)	Wreck / Live	100 m	541692	6238907	Zone H	No overlap with infrastructure – not further inspected
2003	Geophysical anomaly (EMU_Geophysics number_367)	medium	50 m	542643	6236851	Zone G	No overlap with infrastructure – not further inspected
2004	Steamship (UKHO 2982)	Wreck / Live	100 m	543231	6238752	Zone H	No overlap with infrastructure – not further inspected
2005	Steamship (UKHO 2989)	Wreck / Live	100 m	544025	6241465	Zone B	No overlap with infrastructure – not further inspected

WA_ID	Definition	Status/Potential	AEZs	Easting	Northing	Zone	Updated post-review
2006	Geophysical anomaly (EMU_Geophysics number_327)	high	100 m	544044	6241436	Zone B	No overlap with infrastructure – not further inspected
2008	Geophysical anomaly (EMU_Geophysics number_294)	medium	50 m	545313	6242768	Zone H	No overlap with infrastructure – not further inspected
2009	Possible buried object (EMU_Geophysics number_291)	medium	50 m	545412	6231657	Zone E	No overlap with infrastructure – not further inspected
2012	Geophysical anomaly (EMU_Geophysics number_259)	medium	50 m	546068	6231770	Zone E	No overlap with infrastructure – not further inspected
2015	Possible Wreck (EMU_Geophysics number_199)	high	100 m	547362	6231707	Zone D	No overlap with infrastructure – not further inspected
2016	Steamship (UKHO 2964)	Wreck / Live	100 m	547378	6231700	Zone D	No overlap with infrastructure – not further inspected
2018	Anchor/Cable (EMU_Geophysics number_177)	medium	50 m	548044	6233870	Zone C	No overlap with infrastructure – not further inspected
2019	Debris 9 EMU_Geophysics number_134)	medium	50 m	549018	6233868	Zone D	No overlap with infrastructure – not further inspected
2020	Geophysical anomaly (EMU_Geophysics number_106)	high	100 m	549794	6234808	Zone C	AEZ retained (70144)
2021	Submarine (UKHO 71166)	Wreck / Live	100 m	549808	6234816	Zone C	AEZ retained (70144)
2022	Geophysical anomaly (EMU_Geophysics number_1000	high	100 m	549964	6235026	Zone C	No overlap with infrastructure – not further inspected
2023	Wreck (EMU_Geophysics number_98)	high	100 m	549974	6235036	Zone C	No overlap with infrastructure – not further inspected
2024	Submarine (UKHO 2975)	Wreck / Live	100 m	549982	6235037	Zone C	Lies outwith construction zone
2025	Submarine (UKHO 2973)	Wreck / Live	100 m	550042	6235149	Zone C	Lies outwith construction zone
2026	Geophysical anomaly (EMU_Geophysics number_413)	high	100 m	550053	6235203	Zone C	No overlap with infrastructure – not further inspected
2029	Obstruction (UKHO 2969)	Live/medium	50 m	551539	6234206	Zone C	No overlap with infrastructure – not further inspected

WA_ID	Definition	Status/Potential	AEZs	Easting	Northing	Zone	Updated post-review
2030	Geophysical anomaly / Bellax (EMU_0095)	high	100 m	540349	6213674	ECR_M	No magnetic anomaly found at location during pUXO inspection campaign
2031	Debris (EMU_0317)	medium	50 m	544451	6230222	Zone E	No overlap with infrastructure – not further inspected

85. Six sites have been proposed for AEZs in this WSI (Appendix A).

4.4.1.1.1 100 m radius AEZ

86. One known site (A1s), 70144 has been ascribed AEZs of 100 m radius.

87. This is a known wreck site identified in previous assessments (WA 2020/2021)

4.4.1.2 50 m Radius AEZs

88. Five A1 anomalies, 70075, 70364, 70519, 70520 and 71025 have been ascribed AEZs of 50 m radius.

89. Anomaly 70364 consists of 5 magnetic anomalies (70364, 70365, 70366, 70367, 70368) and all fall within the 50 m AEZ of 70364.

4.4.1.3 Monitoring of AEZs

90. The effectiveness of the AEZs will be periodically monitored by the Retained Archaeologist in consultation with the Site Champions. If deemed necessary, these may be monitored by periodic visits to the survey vessels by the Retained Archaeologist, the frequency of which will be decided when a programme of works is established.

91. Intrusive survey activities that may cause physical damage to the seabed will not be undertaken within an AEZ. If it becomes apparent that activities have taken place within any AEZ, the party responsible will obtain advice from the Retained Archaeologist in accordance with their obligations with respect to AEZs and the detail of the project-specific WSI as relevant to any identified AEZs.

92. Periodic Archaeological Reports may be prepared to review whether there have been any incursions into each AEZ and whether there are still archaeological grounds for maintaining each AEZ. Archaeological Reports on AEZs will include recommendations regarding amendment of the extent, removal and/or creation of new AEZs.

4.4.1.4 Temporary Exclusion Zones

93. ORPAD provides for Temporary Exclusion Zones (TEZs) to be introduced when discoveries are made. These operate in a similar way to the fixed AEZs but may be lifted once further mitigation has been completed, with the agreement of the Archaeological Curator.

4.4.1.4.1 A2 Anomalies

94. AEZs have not been recommended at this time for features assigned A2 archaeological potential ratings, and in order to facilitate the design of the development scheme, buffers are not currently proposed for any of these anomalies. However, avoidance of these features by micro-siting is recommended. If there is potential for them to be impacted by the development, they will need to be assessed on a case-by-case basis. This will allow an assessment of the anomaly's relative value. The methodologies for assessing the features could include further geophysical survey, ROV survey, for example in combination with a UXO survey, or diver survey, and these are discussed in more detail in the Scheme of Investigations (section 4.6). Should any further surveys be planned, archaeological advice should be included at the planning stage, to maximise results for archaeological assessment.

95. NnGOWL have undertaken further inspection during 2019 and 2020 of A2 anomalies that fall within Construction Zones. These works were undertaken either as part of potential UXO (pUXO) inspections, where targets overlapped with suspected UXO, or as separate specific potential Archaeological target (pARCH). Target Investigation Reports were reviewed by Wessex Archaeology, allowing for anomalies to have proper archaeological values assigned to them. A total of 758 A2 archaeological anomalies have been retained.

4.4.2 Unexpected Discoveries

96. Where preservation *in situ* is not practicable, disturbance of archaeological sites or material could be offset by appropriate and satisfactory measures, also known as preservation by record. In these circumstances, the effects of the development can be remedied by carrying out excavation and recording prior to the impact occurring. The impact of the development may also be remedied by restabilising sites that have been destabilised, but not destroyed, or by offsetting damage to a site by detailed analysis and safeguarding of otherwise comparable sites elsewhere Such work would be detailed in a Project specific Method Statement, prepared in agreement with the Archaeological Curators.

97. Unexpected material that may only be encountered during the course of the project will be addressed through adherence to the ORPAD.

4.5 Method Statements

4.5.1 General Approach to Method Statements

98. This WSI provides a framework for further investigations for the Project. All works will be undertaken in accordance with the methodology set out within this WSI and in compliance with the standards outlined by the CIfA (CIfA 2014a-g), excepting where they are superseded by statements made below.

99. Detailed method statements will be produced, as required, for further archaeological works, such as those identified in the 'Scheme of Investigations' section, below.

100. Each archaeological method statement will correspond to a package of works, for example, archaeological assessment of marine geophysical data, archaeological assessment of ROV data from the UXO survey, and archaeological investigation using divers and/or ROVs.

101. Method statements will provide details about:

- Form of commission and contractual relationship with the Project;
- Relation between the method statement, the WSI and the licence condition(s);
- Context in terms of relevant construction works;
- Specific objectives of archaeological works;
- Extent of investigation;
- Investigation methodology
- Anticipated post-investigation actions, including processing, assessment and analysis of finds and samples;
- Reporting;
- Timetable;
- Monitoring arrangements; and
- Health, safety and welfare.

102. Method statements will be provided to NnGOWL for comment. On receipt of comments from them, the Retained Archaeologist will produce a final method statement addressing these comments.

103. Method statements will be submitted HES for approval and will include provision for the relevant Archaeological Curator(s) to monitor the progress of the archaeological works, as appropriate, be that through site visits or meetings with NnGOWL, the Contractor(s), and the Retained Archaeologist.

4.5.2 Forthcoming Activity Specific Method Statements

104. Currently a range of pre-construction activities are planned for the project (Table 4-2). A summary is set out below, with the envisaged approach to archaeological mitigation outlined.

105. Method Statements setting out the activity specific mitigation strategy for marine cultural heritage assets will typically be produced for activities with interaction with the seabed. Other mitigation requirements will be undertaken as per the overarching mitigation strategy Scheme of Investigations set out in this document (Section 4.6) – e.g. archaeological assessment of geophysical data, and geoarchaeological review of geotechnical data.

Table 4-3 Planned pre-construction activities

Activity	Equipment	Interaction with Seabed	Approach to Archaeological Mitigation	Location	Activity Date
Offshore UXO/boulder geophysical survey	Sub-bottom Profiler (SBP), Magnetometer, Side Scan Sonar (SSS), Multi-beam Echosounder (MBES)	No	Archaeological assessment of geophysical data. Recommendations for avoidance, or investigation. AEZs ORPAD	Wind farm and export cable corridor to 1 km from landfall	Data Gathering Completed Archaeological Review for completion in Q3 2019
UXO inspection geophysical/visual survey	Sonar, ROV visual (cameras), airlift suction pump to suck up and disperse sediments, moving of small debris within the vicinity	Yes	**Method Statement:** Focus on ROV data review of possible archaeological features. Recommendations for avoidance, or investigation. AEZs ORPAD	Wind farm and export cable corridor	Q4 2019 – Q2 2020
Seabed preparation	Removal of boulders from works areas and infill of spudcan depressions in works areas	Yes	AEZs ORPAD	Wind farm and export cable corridor	Q4 2019 – Q4 2020
Nearshore geotechnical survey	Boreholes, Cone Penetration Tests (CPTs)	Yes	**Method Statement:** Archaeological assessment of geotechnical data (principally borehole and vibrocore logs and CPTs, supplemented with sub-bottom profiler datasets as appropriate. Analysis of geotechnical samples if required (to be discussed following initial review of logs). AEZs	Export cable corridor only at landfall end (approx. first 1.5 km)	Q4 2019
Nearshore UXO/boulder geophysical survey	SBP, Magnetometer, SSS, MBES	No			Q4 2019
Offshore geotechnical survey	Boreholes CPTs, vibrocores	Yes		Wind farm	Q2 2020

Activity	Equipment	Interaction with Seabed	Approach to Archaeological Mitigation	Location	Activity Date
			ORPAD		
UXO clearance	Detonation of confirmed UXO items	Yes	AEZs ORPAD	Wind farm and export cable corridor	Q2 2020

4.6 Scheme of Investigations

4.6.1 Introduction

106. This WSI is based on recommendations made in the Project EIA Report (March 2018) and sets out the mitigation and associated high level scheme of investigations for the Projects. This scheme of investigations represents a general foundation for all further archaeological works. Individual method statements for each package of works will be produced to detail the nature of archaeological works to be carried out.

107. The method statements and specifications in this document are based on archaeological best practice and guidance for offshore development. The principal sources are:

- Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects. Guidance issued by The Crown Estate (hereafter referred to as 'Model Clauses');
- Joint Nautical Archaeology Policy Committee (JNAPC) Code for Practice for Seabed Development 2006;
- COWRIE Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy 2008.
- The Protocol for Archaeological Discoveries: Offshore Renewables Projects (ORPAD). The Crown Estate 2014.

108. The project of investigation outlined below includes guidance outlining the requirements and expected standards in relation to:

- recording, reporting, data management and archiving;
- samples and artefacts;
- AEZs;
- marine geophysical investigations;
- marine geoarchaeological investigations;
- investigations using divers and/or ROVs; and
- watching briefs.

109. Further detailed information can be found in The Crown Estate Model Clauses document accessed here: https://www.wessexarch.co.uk/sites/default/files/field_file/4_WSI%20Renewables.pdf .

4.6.2 Standards and Guidance

110. The method statements and specifications in this document are based on archaeological best practice and guidance for offshore development. Please note English Heritage are now Historic England, although much of the guidance was published under English Heritage. The principal sources are:

- Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007);
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011);
- Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects (TCE, 2010);
- Protocol for Archaeological Discoveries: Offshore Renewables Projects (TCE, 2014);
- Code for Practice for Seabed Development (JNAPC, 2006);
- Standard and guidance for archaeological field evaluation (CIfA, 2014a);
- Standard and guidance for nautical archaeological recording and reconstruction (CIfA, 2014g);
- Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers (English Heritage 1998);
- Military Aircraft Crash Sites: Guidance on their Significance and Future Management (English Heritage, 2002);
- Wind Energy and the Historic Environment (English Heritage, 2005);
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage, 2008);
- Ships and Boats: Prehistory to Present – Designation Selection Guide (Historic England, 2012);
- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (English Heritage, 2013);
- Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning: 2 (Historic England, 2015c);
- Preserving Archaeological Remains: Decision-taking for Sites under Development (Historic England, 2016); and
- Our Seas – A Shared Resource: High Level Marine Objectives (Department for Environment, Food and Rural Affairs (DEFRA), 2009).

4.6.3 Archaeological Exclusion Zones

4.6.3.1 Overview

111. AEZs of 50 m and 100 m have previously been applied to seabed features within the Project area (Headland Archaeology 2010). These have been updated with recent review of geophysical survey data (Wessex Archaeology 2020a & b).

112. These AEZs may be subject to change if further relevant data becomes available, including being reduced or removed as appropriate. It may also be necessary to implement new AEZs if, for example, further survey demonstrates that additional anomalies are of definite archaeological potential.

113. For all aspects of the application of AEZs the Project will adhere to standards and guidance as set out in the Model Clauses document.

114. Key points relevant to the application of AEZs are included below.

4.6.3.2 Location and Extent

115. AEZs of 50 m and 100 m, agreed between NnGOWL and the Archaeological Curators will be the principal means to preserve known sites in situ.

116. NnGOWL will require its contractors to conduct all construction activity in such a way as to prevent any impacts by construction or related works within any AEZs, including impacts from plant and equipment that is not directly engaged in construction.

4.6.3.3 Altering Archaeological Exclusion Zones

117. AEZs may be altered (enlarged, reduced, moved or removed) as a result of further data assessment or archaeological field evaluation of data covering those areas that are subject to AEZs. Further data assessment could include a formal archaeological analysis of new geophysical data, and archaeological field evaluation could include suitable high-resolution geophysical survey and/or field survey.

118. The alteration of AEZs will only be undertaken with the agreement of Archaeological Curators. Following alteration, a new plan giving details of the AEZs will be drawn up and issued to each relevant party.

119. NnGOWL will notify its contractors of AEZs and of any alteration or removal of AEZs.

120. If new finds of archaeological importance come to light during the course of construction, ORPAD provides for temporary exclusion zones to be introduced when discoveries are made. The temporary exclusion zone may be lifted following advice or may form the basis of an AEZ in the event that further disturbance should be avoided.

4.6.3.4 Monitoring Archaeological Exclusion Zones

121. Provision for monitoring AEZs will be set out in a method statement agreed between NNGOWL and the Archaeological Curators with reference to any relevant regulatory consent. Monitoring will take place relative to the baseline data used to establish the AEZ and continue for the duration set out in the project specific WSI.

122. Development-related activities will not be undertaken within an AEZ. If it becomes apparent that activities have taken place within any AEZ, the party responsible will obtain advice from the Retained Archaeologist in accordance with their obligations with respect to the project-specific WSI.

123. Periodic Archaeological Reports will be prepared to review whether there have been any incursions into each zone and whether there are still archaeological grounds for maintaining each zone. These reports will be issued to NnGOWL and submitted to the Archaeological Curator for approval, to keep track of any required alterations of AEZs as discusses in paragraph 97 and 98 above.

124. Post-construction monitoring will be carried out in accordance with the methods and timescales set out in the project-specific WSI with a view to identifying any impacts on AEZs attributable to indirect effects of construction.

4.6.4 Micrositing

125. Turbines, associated infrastructure, cables, legs of jack-up vessels and/ or anchors of other vessels will be microsited to avoid the AEZs.

4.6.5 Marine Geophysical Investigations

126. NnGOWL will allow for archaeological involvement in the planning, acquisition and review of further geophysical surveys including additional pre-construction and planned post-construction surveys.

127. For all aspects of marine geophysical investigations NnGOWL will adhere to standards and guidance as set out in the Model Clauses document.

128. Key points relevant to marine geophysical investigations are included below.

4.6.5.1 Archaeological Input in Planning Marine Geophysical Investigations

129. The specification of any proposed marine geophysical surveys whose primary aim is non-archaeological will be subject to advice from the Retained Archaeologist to ensure that archaeological input is provided at the planning stage and to enable archaeological considerations to be taken into account without compromising the primary objective of the survey.

130. Where a survey is carried out primarily to meet archaeological objectives, the specification shall be prepared by the Retained Archaeologist and carried out by a survey company with appropriate archaeological expertise.

4.6.5.2 Undertaking further Marine Geophysical Surveys

131. Where a survey is carried out primarily to meet archaeological objectives, the survey will be carried out by a survey company with appropriate archaeological expertise and including geophysicists with appropriate archaeological expertise onboard.

132. Where archaeological objectives have been added to a survey specification whose primary objectives are non-archaeological (e.g. UXO investigation), consideration will be given to having an archaeologist or geophysicist with appropriate archaeological expertise onboard during the acquisition of data. The onboard archaeologist will advise on the suitability for archaeological purposes of the data being acquired, and be able to propose, through communication with the Retained Archaeologist, minor changes to the survey method, settings, etc. in order to optimise archaeological results, and thereby minimise the need for repeat surveys.

133. The Model Clauses document details specifications for archaeological marine geophysical investigations with regard to:

- sidescan sonar survey;
- magnetometer survey;
- sub-bottom survey; and
- multibeam survey.

4.6.5.3 Archaeological Interpretation of Marine Geophysical Data

134. New geophysical survey data will be interpreted by an archaeologist with an appropriate level of expertise.

135. Raw survey data, together with factual reports and trackplots, will be made available in digital formats to the Archaeological Contractor.

136. Archaeological interpretation will include:

- Examination of sidescan, magnetometer, sub-bottom and multibeam data for the area and surroundings of known wreck sites and previously identified geophysical anomalies;
- Examination of sidescan, magnetometer, sub-bottom and multibeam data within areas that will be subject to scheme impacts in order to identify as yet unknown wreck remains;
- Assessment of sub-bottom data in order to plot the general trend of the sub-surface sediments with archaeological potential; and
- Following the initial assessment, further detailed interpretation of sub-bottom data within those areas that will be subject to scheme impacts.

137. The results of further geophysical interpretation will be compiled as an Archaeological Report consistent with the Model Clauses on reporting.

4.6.6 Marine Geotechnical Investigations

4.6.6.1 Introduction

138. NnGOWL will allow for archaeological involvement in the planning, acquisition and review of further geotechnical surveys including pre-construction and future monitoring surveys.

139. The archaeological assessment of new marine geoarchaeological data will facilitate NnGOWL's aim to avoid significant impacts through aiding further identification and clarification of known and potential receptors. The acquisition and review of new data for archaeological purposes will also contribute to any requirements to offset unavoidable impacts to potential archaeology.

140. For all aspects of future marine geoarchaeological investigations NnGOWL will adhere to standards and guidance as set out in the Model Clauses document.

141. Key points relevant to marine geoarchaeological investigations are included below.

4.6.6.2 Archaeological Input in Planning Marine Geoarchaeological Investigations

142. The specification of any proposed geotechnical surveys will be subject to advice from the Retained Archaeologist to ensure that archaeological input is provided at the planning stage and to enable archaeological considerations to be taken into account. The geotechnical specification will also be informed by any previous stages of work, for example archaeological interpretation of geophysical data.

143. Archaeological Curators will be consulted regarding the proposed locations of geotechnical work and will be provided with the results of each stage of investigation.

4.6.6.3 Geoarchaeological Investigations

144. A structured approach will be taken to any necessary archaeological analysis of the material obtained as appropriate to satisfy the requirements of the Archaeological Curators for delivery of the required mitigation measures.

145. The objectives, approaches and methods to be applied in each geoarchaeological investigation will be set out in a Method Statement which will be subject to agreement with Archaeological Curators.

146. Consultation will be held between the Archaeological Contractor (and Retained Archaeologist, where appointed) and the contractor undertaking geotechnical investigations in order to enable the relevant samples to be retained for geoarchaeological analysis.

147. The Model Clauses document details specifications for archaeological marine geoarchaeological investigations with regard to:

- archaeological recording and assessment of geotechnical cores;
- archaeological review of geotechnical logs;
- sub-sampling; and
- laboratory assessment and analysis of samples and sub-samples.

148. The results of further geoarchaeological investigation will be compiled as an Archaeological Report consistent with the Model Clauses on reporting. The report will represent the stage of analysis that is agreed with Historic Environment Scotland and would include a broad chronological framework for the completed analysis.

4.6.7 Archaeological Investigations Using ROVs

149. Archaeological ROV-based investigations will take place where the primary objectives are archaeological, and the diving is led by archaeologists.

150. Archaeological ROV surveys can be employed in order to gather archaeological data concerning wreck sites and geophysical anomalies to safeguard the archaeological record or to alter (enlarge, reduce, move or remove) existing AEZs or TEZs. Specifically, an archaeological ROV-based assessment may be required where it is not possible to protect an archaeological site through the implementation of an AEZ or where visual clarification is sought in order to confirm or amend an AEZ or TEZ.

151. ROV assessment primarily for archaeological purposes will be undertaken by an Archaeological Contractor with a marine archaeological team with the appropriate expertise and experience of the environment/conditions likely to be encountered.

152. Every dive will be recorded using a digital video system captured from the ROV's onboard instrumentation.

153. The position of the ROV will be determined using an acoustic navigation system. The position will be integrated into the tracking and recording system where the position of the objects on the seabed can be compared to the geophysical data, and the extent and character of the features recorded.

154. Recording will be conducted to a level whereby a statement can be made as to the date, character, extent and archaeological importance of the site. Significant diagnostic features will be recorded by photography backed up with written records and measurements. Limited documentary research may also be required to support the assessment of importance.

4.6.8 Archaeological Watching Briefs

155. A watching brief is a formal programme of archaeological monitoring and will involve attendance by an Archaeological Contractor during groundworks. Watching briefs by a suitably qualified archaeologist may be applicable to the construction of the Project where material is excavated/dredged during investigation works.

156. For the proposed HDD works at landfall, where exit pits are required, an archaeological watching brief could be instituted, following further details of the likely methods to be utilised. The archaeological watching brief would require a specific method statement, based on the specifics of the onshore WSI, and should be approved by the Archaeological Curator(s) prior to works being undertaken.

157. For all aspects of archaeological watching briefs, NNGOWL will adhere to standards and guidance as set out in the Model Clauses document.

4.6.8.1 Watching Brief Recording Procedures

158. Excavated surfaces and up-cast material will be inspected by the Archaeological Contractor. Any finds will be collected and allocated a record number and their position will be logged.

159. Archaeological features or structures will be examined and/or excavated. A sufficient sample of each layer/feature type will be investigated in order to elucidate the date, character, relationships and function of the feature/structure.

160. Recording will include written, drawn, and photographic elements as conditions allow.

161. The findings of any watching briefs will be compiled as an Archaeological Report (section 4.8.2) consistent with the Model Clauses on reporting.

4.7 Finds and Environmental

4.7.1 Finds

162. All archaeological finds from excavated contexts will be retained, although those from features of modern date (19th century or later) may be recorded on site and not retained, depending on the research objectives of the project. Where appropriate, soil samples may be taken and sieved to aid in finds

recovery. Any finds requiring conservation or specific storage conditions will be dealt with immediately in line with First Aid for Finds (Watkinson and Neal 1998) and First Aid for Underwater Finds (Robinson 1998). A full record will be made of any treatment given.

163. Finds and other items of archaeological interest recovered offshore in the course of investigation are the property of The Crown Estate/Crown Estate Scotland as the landowner, with the exception of any human remains, and 'wreck' for the purposes of the Merchant Shipping Act 1995, or material covered by the Protection of Military Remains Act 1986.

164. If the Receiver of Wreck has not found ownership within one year, any finds left in storage with Retained Archaeologist, that are not requested by the Client/Landowner/The Crown Estate Scotland, will revert to the ownership of the Retained Archaeologist for the purposes of storage, transfer to appropriate repository, or discard.

4.7.2 Ordnance

165. If items of ordnance are discovered, they will be treated with extreme care. Company Health & Safety policies and established operational procedures should always take priority over archaeological reporting of munitions and ordnance.

166. Any firearms and ammunition are likely to be subject to the Firearms Acts (various dates). Ammunition should be regarded as ordnance, regardless of its size.

4.7.3 Human Remains

167. In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending the Retained Archaeologist a Ministry of Justice Licence (this includes cases where remains are to be left in situ).

168. Should human remains require removal, all excavation and post-excavation will be in accordance with the Retained Archaeologist's protocols, and current guidance documents (e.g. McKinley 2013) and the standards set out in CIfA Technical Paper 13 Excavation and post-excavation treatment of cremated and inhumed remains. Appropriate specialist guidance/site visits will be undertaken if required.

169. The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the Ministry of Justice licence.

4.7.4 Treasure

170. The Retained Archaeologist will immediately notify the Client and the Curator(s) on discovery of any material covered, or potentially covered by the Treasure Trove in Scotland, which is based on the principles of the Scots common law bona vacantia (ownerless goods). In Scotland, any ownerless objects found by chance or through activities such as metal-detecting, field-walking, or archaeological excavation become the property of the Crown and therefore may be claimed as treasure trove. With the exception of modern objects, any object considered to be significant, regardless of its age or composition, may be claimed as treasure by the Crown. Treasure Trove applies inland of Mean Low Water Springs (MLWS) only and therefore is not applicable offshore.

171. Material recovered below MHWS to 12nm may be regarded as Wreck under the Merchant Shipping Act 1996 (see section 4.7.6).

4.7.5 Aircraft

172. The majority of aircraft wrecks are military and therefore fall under the Protection of Military Remains Act 1986. All military aircraft crash sites in the UK, its territorial waters, or British aircraft in international waters, are controlled sites under this Act. It is an offence under this Act to tamper with, damage, move

or unearth any items at such sites, unless the Ministry of Defence (MoD) has issued a licence authorising such activity. Consequently, anyone wishing to recover a military aircraft or excavate a military aircraft crash site in the UK is required to obtain a licence from the Joint Casualty and Compassionate Centre (JCCC). A licence is required irrespective as to whether the aircraft was in the service of another nation's armed forces.

173. Any finds that are suspected of being military aircraft will be reported immediately to the Retained Archaeologist. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately.

4.7.6 Wreck

174. Archaeological artefacts that have come from a ship are 'wreck' for the purposes of the Merchant Shipping Act 1995. NnGOWL, via the Retained Archaeologist, should ensure that the Receiver of Wreck is notified within 28 days of recovery, for all items of wreck that have been recovered.

4.7.7 Environmental Sampling

175. All sampling will be undertaken following guidance which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b).

176. Bulk environmental soil samples, for the recovery of plant macrofossils, wood charcoal, small animal bones and other small artefacts, will be taken as appropriate from well-sealed and dateable contexts or features.

177. If waterlogged or mineralised deposits are encountered, an environmental sampling strategy will be devised and agreed with the Curator(s) as appropriate.

178. Following specialist advice, other sampling methods such as monolith, Kubiena or contiguous small bulk (column) samples may be employed to enable investigation of deposits with regard to microfossils (e.g., pollen, diatoms) and macrofossils (e.g., molluscs, insects), soil micromorphological or soil chemical analyses.

4.7.8 Conservation and Storage

179. All recovered materials, from land or underwater, will be subject to a Conservation Assessment to gauge whether special measures are required while the material is being held. This Conservation Assessment will be carried out by the Retained Archaeologist or an Archaeological Contractor with an appropriate level of expertise, with advice from appropriate specialists. The Retained Archaeologist or an Archaeological Contractor with appropriate expertise will implement recommendations arising from the assessment. If no special measures are recommended, finds will be conserved, bagged, boxed and stored in accordance with industry guidelines (CIfA 2014b).

4.8 Post-Excavation and Reporting

4.8.1 Finds

180. All retained finds will, as a minimum, be washed, weighed, counted and identified. They will then be recorded to a level appropriate to the aims and objectives of the investigation. The report will include a table of finds by period and/or feature group.

181. Metalwork from stratified contexts will be X-rayed and, along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects and other conservation needs will be undertaken by an approved conservation centre.

182. Artefacts and other finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the CIfA (2014b).

183. Environmental

184. Any waterlogged or mineralised samples will be processed by standard waterlogged flotation methods.

4.8.2 Reporting

4.8.2.1 General

185. Following completion of the fieldwork and/or the assessment of the data, a draft report will be submitted for approval to NnGOWL and the Curator(s), for comment. Once approved, a final version will be submitted.

- The report will typically include the following elements:
- A non-technical summary;
- The aims and methods of the work;
- The results of the work including finds and environmental remains;
- A statement of the potential of the results;
- Proposals for further analysis and publication;
- Appendices;
- Illustrations; and
- References

186. A copy of the final report will be deposited with HES and ELCAS along with surveyed spatial digital data (.dxf or shapefile format) relating to the evaluation.

4.8.2.2 Publication

187. If no further mitigation works are undertaken, a short report on the results of the evaluation will be prepared for publication in a suitable journal, if considered appropriate and agreed with NnGOWL and the Archaeological Curator(s).

4.8.2.3 OASIS

188. An OASIS online record (http://oasis.ac.uk/pages/wiki/Main) will be created, with key fields completed, and a .pdf version of the final report submitted. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the ELCAS and HES records and published through the Archaeology Data Service ArchSearch catalogue.

4.8.3 Archive Storage and Curation

4.8.3.1 Museum

189. Every effort will be made to identify a suitable repository for the archive resulting from the investigation. If no suitable repository is identified, the Retained Archaeologist will continue to store the archive, but may institute a charge to NnGOWL for ongoing storage beyond a set period. Deposition of any finds with a museum will only be carried out with the full agreement of The Crown Estate or the owner (as confirmed by the Receiver of Wreck). Artefacts and other finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the CIfA (2014b).

190. Relevant finds will be reported through Treasure Trove. The Scottish Archaeological Finds and Allocations Panel will either allocate the assemblage to a museum or, if no museum wishes to acquire the assemblage, it will be disclaimed as the property of the Crown and the Retained Archaeologist and Client

may decide on its deposition. The Retained Archaeologist may institute a charge to the client for ongoing storage beyond a set period.

4.8.3.2 Transfer of title

191. On completion of the investigation (or extended fieldwork programme), every effort will be made to persuade the legal owner of any finds recovered, except those allocated through the Treasure Trove process, to transfer their ownership to the accepting institution in a written agreement.

4.8.3.3 Preparation of Archive

192. The complete project archive, which may include paper records, graphics, artefacts, ecofacts and digital data, will be prepared following the standard conditions for the acceptance of excavated archaeological material. The archive will usually be deposited within one year of the completion of the project, with the agreement of NnGOWL.

193. The relevant Archaeological Curator(s) and the Retained Archaeologist will agree with the receiving institution a policy for the selection, retention and disposal of recovered or excavated material, and confirm requirements in respect of the format, presentation and packaging of archive records and materials. The receiving institution will be notified in advance of any fieldwork.

194. All digital data will be considered part of the primary archive and will accord with the procedures recommended by The Crown Estate, Marine Environment Data and Information Network (MEDIN), Archaeological Data Service (ADS) and the accepting institution.

195. Data will be compiled in a format suitable for submission of Monument, Event and Source records for entry into East Lothian Historic Environment Record.

4.8.3.4 Selection Policy

196. The Retained Archaeologist will follow national guidelines on selection and retention (SMA 1993; Brown 2011, section 4). In accordance with these and any specific guidance prepared by the museum, a process of selection and retention will be followed so that only those artefacts or ecofacts that are considered to have potential for future study will be retained. The selection policy will be agreed with the museum, and fully documented in the project archive. Material not selected for retention may be used for teaching or reference collections by the museum, or by the Retained Archaeologist.

4.8.3.5 Security Copy

197. In line with current best practice (e.g. Brown 2011), on completion of the project a security copy of the written records will be prepared in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

4.8.4 Outreach and Social Media

198. NnGOWL will seek where possible opportunities to disseminate results and engage with the local community.

4.8.5 Copyright

4.8.5.1 Archive and Report Copyright

199. The full copyright of the written/illustrative/digital archive relating to the project will be retained by the Retained Archaeologist under the Copyright, Designs and Patents Act 1988 with all rights reserved. The client will be licensed to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use conforms

to the Copyright and Related Rights Regulations 2003. In some instances, certain regional museums may require absolute transfer of copyright, rather than a licence; this should be dealt with on a case-by-case basis.

200. Information relating to the project will be deposited with the Historic Environment Record (HER) where it can be freely copied without reference to the Retained Archaeologist for the purposes of archaeological research, or development control within the planning process.

4.8.5.2 Third Party Data Copyright

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

5 Protocol for Archaeological Discoveries

5.1 Offshore Reporting Protocol for Archaeological Discoveries (ORPAD)

202. Unexpected archaeological discoveries that come to light during the course of the construction, operation or decommissioning of the Project will be addressed by the implementation of the Protocol for Archaeological Discoveries: Offshore Renewables Project (ORPAD). ORPAD has been developed by Wessex Archaeology on behalf of the Crown Estate specifically for offshore renewables development projects.

203. The aim of ORPAD is to reduce any adverse effects of the development on the historic environment, by enabling people working on the development to report archaeological discoveries in a manner that is both convenient to their everyday work and effective with regard to curatorial requirements.

204. The protocol anticipates discoveries being made by staff, who report to a Site Champion (the Client Representative), who then reports to a person within the construction contractor (the Nominated Contact) who has been nominated by the contractor to co-ordinate implementation of the protocol.

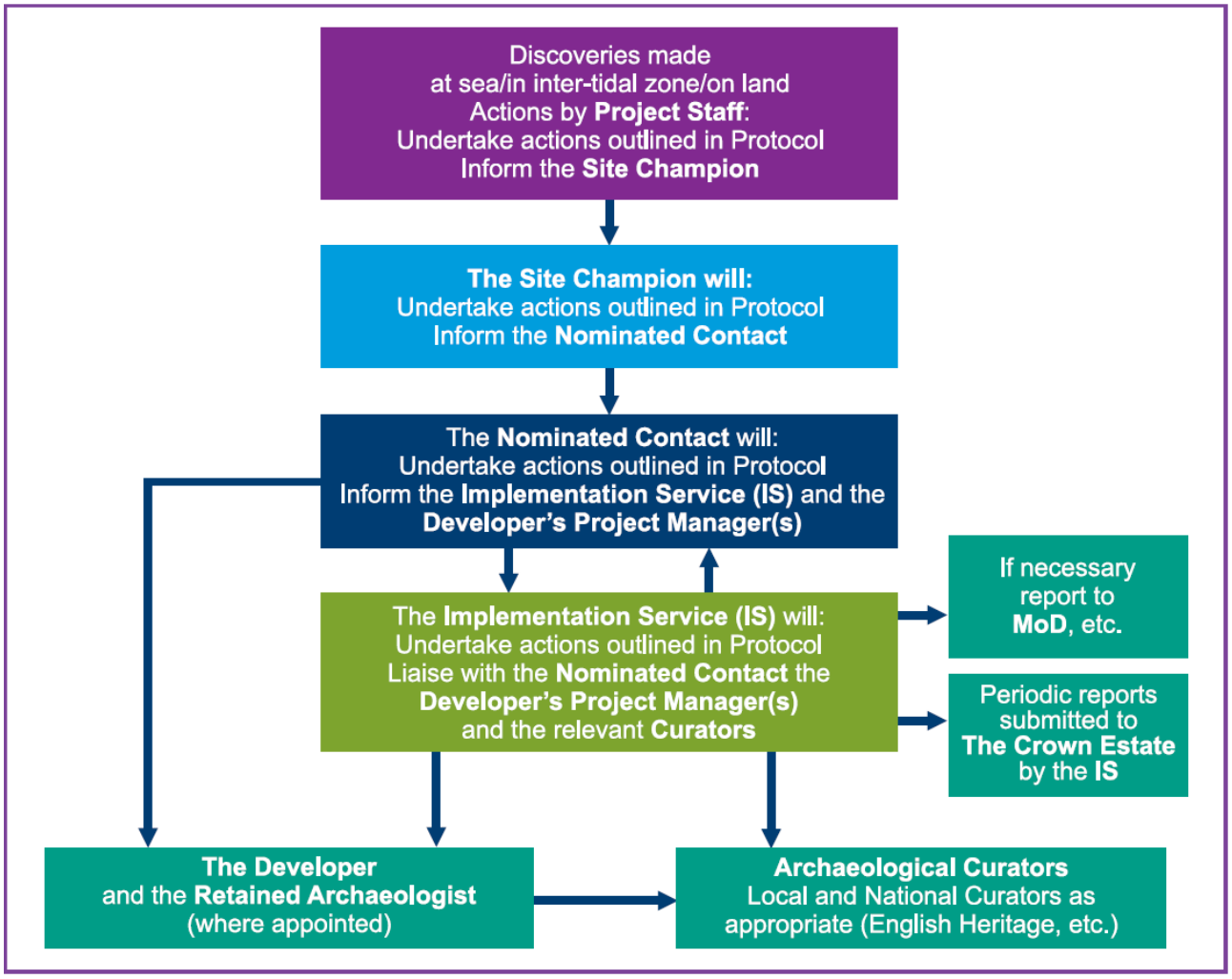
205. The Nominated Contacts in this case for NnGOWL should be contacted as follows:

- Sarah MacNab. Environmental Clerk of Works. NnGOWL. Atria One, Level Six, 144 Morrison Street, Edinburgh EH3 8EX. Mobile: +44 (0)7766 900074 E-mail: Sarah.MacNab@nngoffshorewind.com
- Claire Gilchrist. Offshore Consents Manager. NnGOWL. Atria One, Level Six, 144 Morrison Street, Edinburgh EH3 8EX. Mobile: +44 (0)131 376 9929 E-mail:

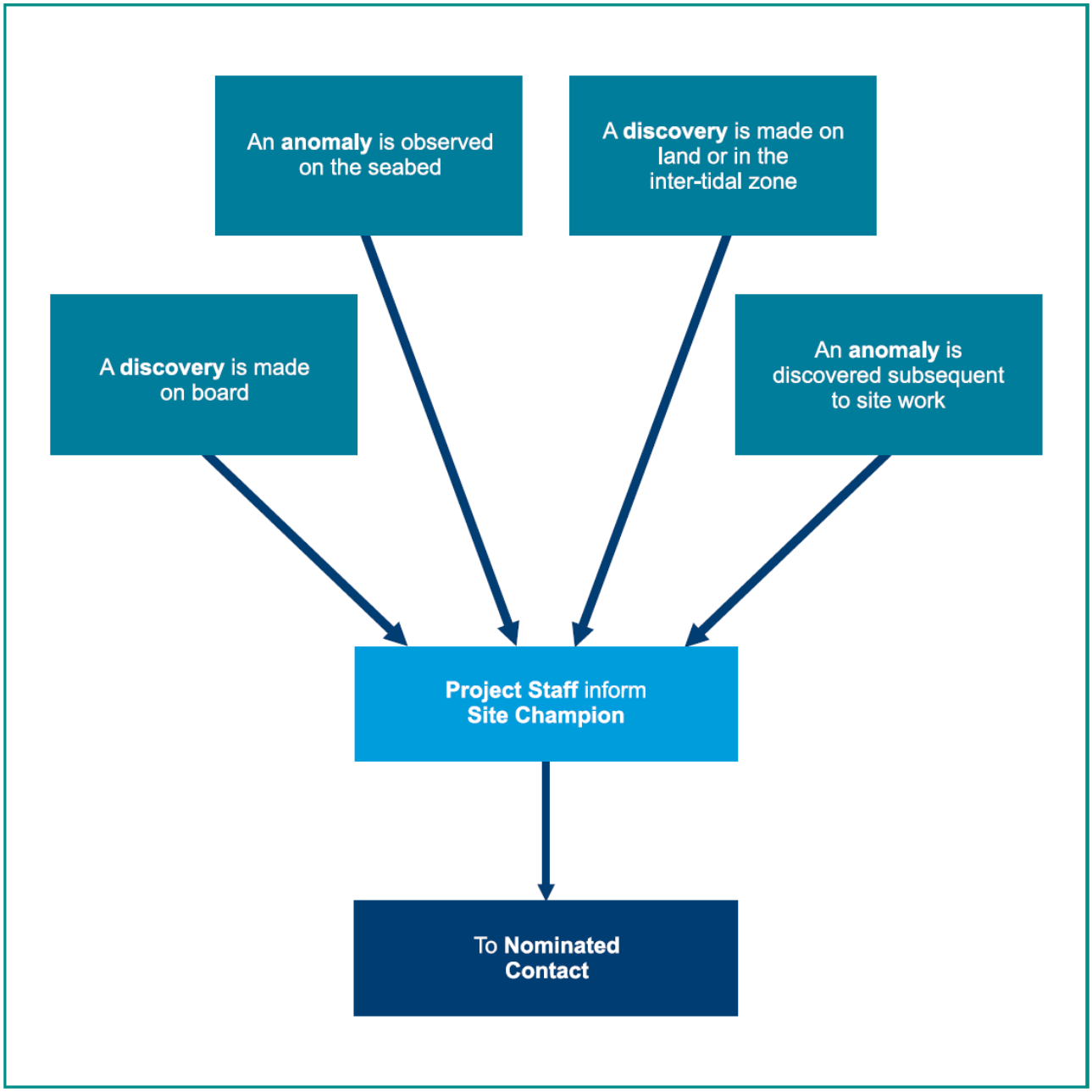
  Claire.Gilchrist@nngoffshorewind.com

206. The Nominated Contact will identify a Site Champion (who will be a Client Representative third party to both the Contractor and the Developer working on behalf of the Developer) to act as a first point of contact for staff, and to liaise with the Nominated Contact in respect of the implementation of the ORPAD during the proposed works.

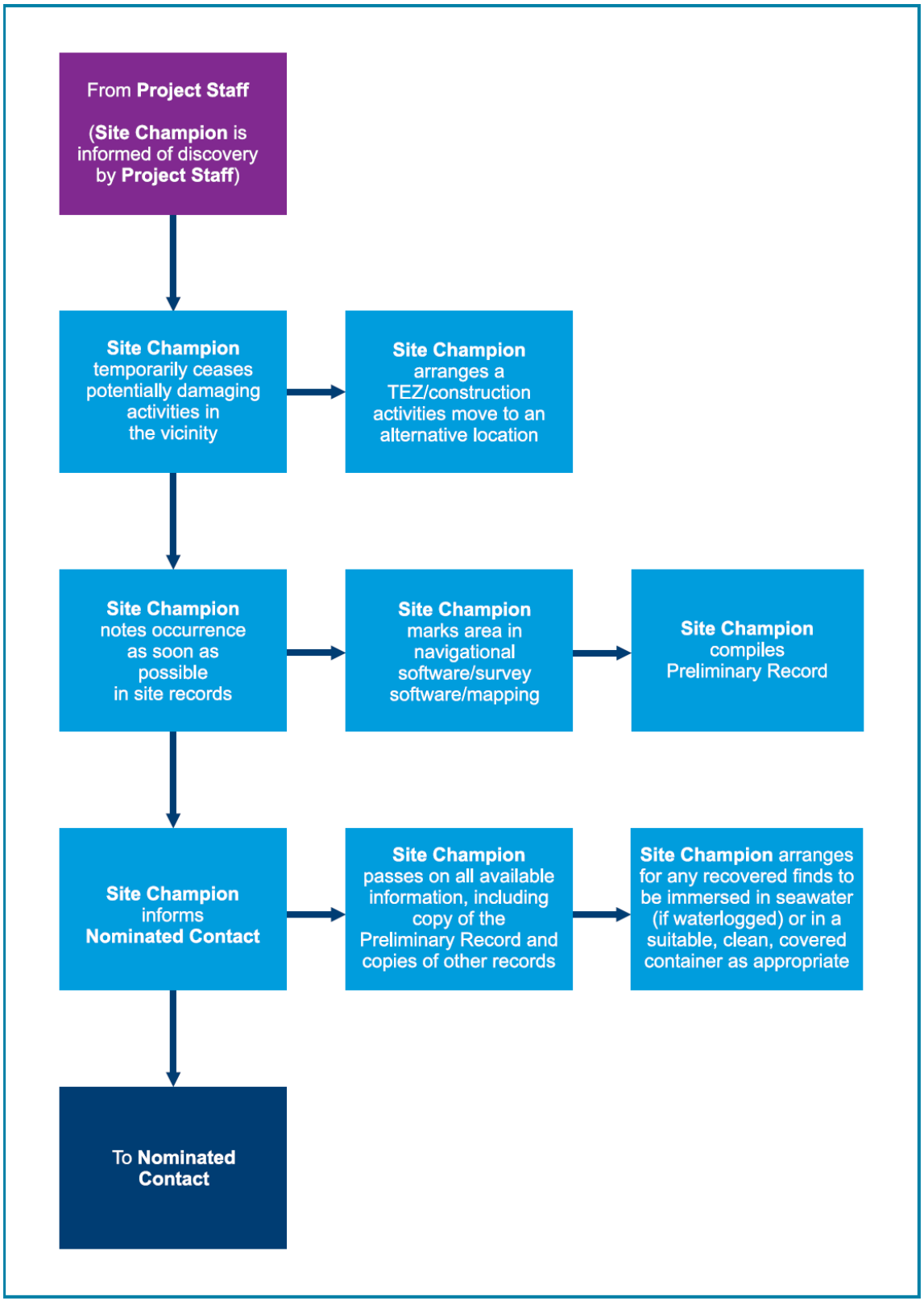
5.1.1 Basic Sequence of Reporting (when an archaeologist is not present)



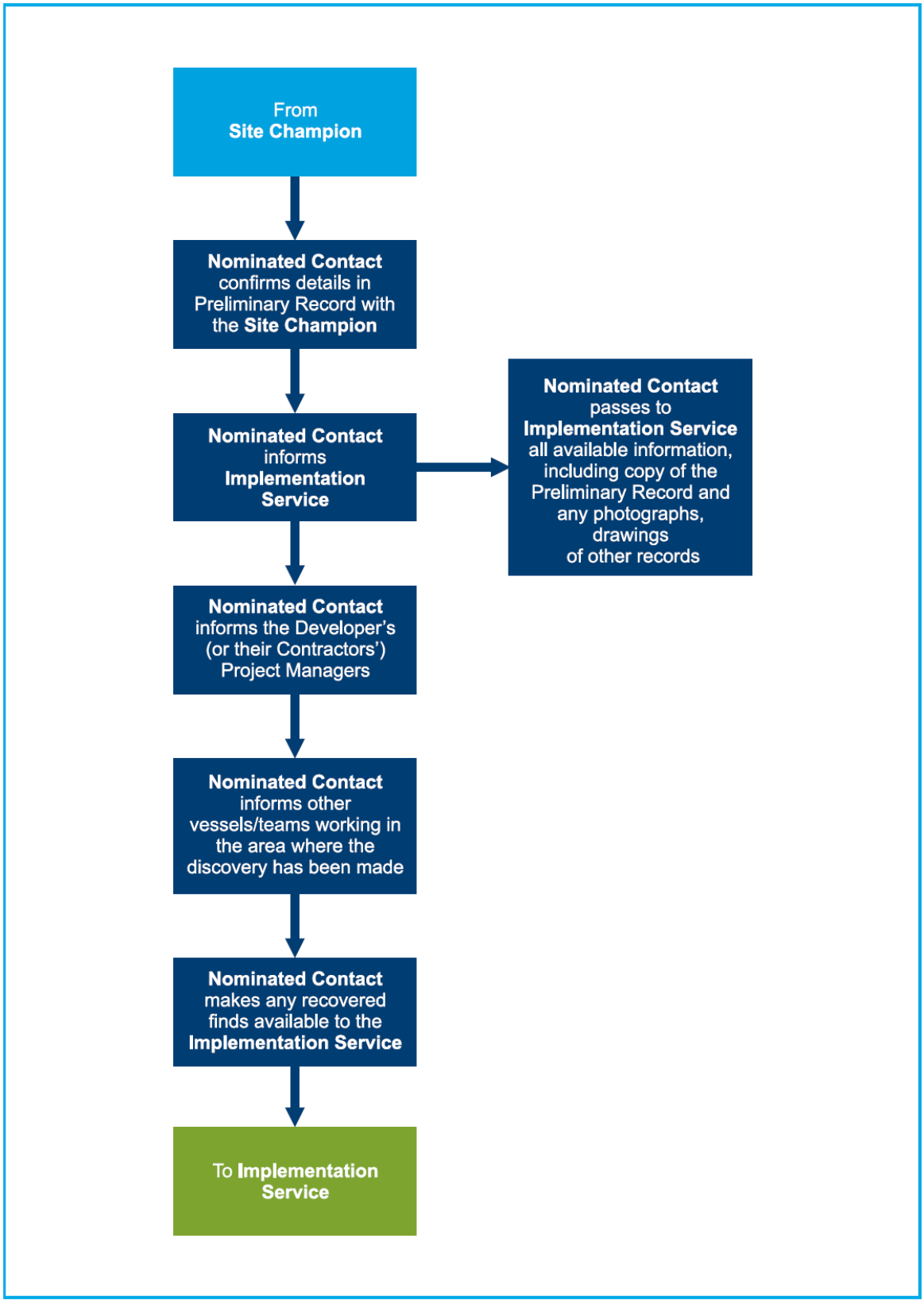
5.1.2 Actions by Project Staff (when an archaeologist is not present)



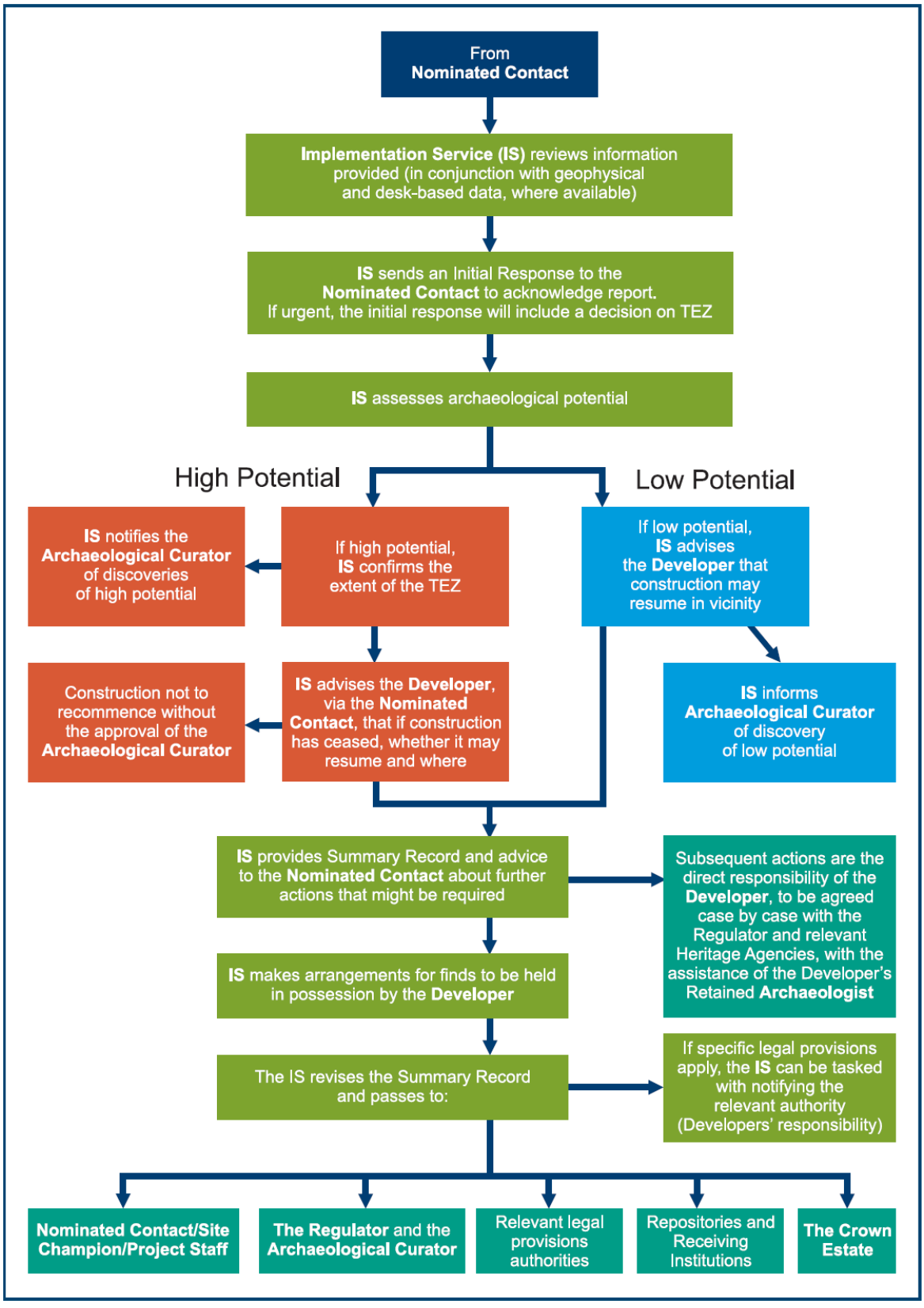
5.1.3 Actions by Site Champion



5.1.4 Actions by Nominated Contact



5.1.5 Actions by the Implementation Service



6 Compliance with the Application

6.1 Introduction

207. In addition to the conditions presented in Table 1-1, Condition 7 of the S36 Consent states that:

> *Except as otherwise required by the terms of this consent, the Development must be constructed and operated in accordance with the Application (as supplemented by the additional environmental information (EIA Addendum), submitted by the Company on 26 July 2018) and any other documentation lodged in support of the Application.*

208. And conditions 3.1.1 of the Wind Farm and OfTW ML states that:

> *The Licensee must at all times construct, operate and maintain the Works in accordance with this licence, the Application and the plans and programmes approved by the Licensing Authority.*

209. The Application detailed a number of mitigation commitments specific to mitigating effects of the Project on archaeology. Measures are presented in full in Appendix B, which also identifies where each commitment has been addressed within this document.

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Appendix A – Gazetteer of Marine Archaeological Receptors with AEZs

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
70075	Debris	548024	6232176	A1	-	-	-	299	Large positive monopole identified on the magnetometer data. A small dark reflector with height is identified on the SSS data at this location, and a small depression, measuring 8.2 x 6.5 x -0.1 m, is identified on the MBES data. This was investigated by ROV and found to be a possible feature of interest. Archaeological assessment of the ROV footage by the retained archaeologist found that the feature is a possible sponson or float of an aircraft, possibly a military aircraft, measuring 8 x 0.5 x 0.5 m. Further investigation is needed to confirm this interpretation however, if the interpretation is correct, the feature would be of high significance. As such, the feature has been given an A1 archaeological discrimination. It has been left *in situ*.	Zone D	Zone D	D_MAG_0030
70144	Wreck	549802	6234811	A1	20.4	5.8	3.6	3521	A large, very distinct angular dark reflector measuring 6.5 x 4.7 m within a possible area of scour, identified on the SSS data. Feature only partially covered by SSS data and therefore hasn't been fully imaged. This is likely one end of a possible	Zone C	Zone C	71166 (UKHO), 2020 and 2021 (Wessex Archaeology WSI)

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
									submarine (UKHO 71166). On the SSS data, the wreck is seen to have some associated smaller indistinct dark reflectors, likely representing associated items of debris. On the MBES data, the feature is seen as a distinct mound, in a north-east to south-west alignment, possibly with a section missing on its south-east side, which may indicate partial disintegration. Feature has a very large magnetic anomaly associated with it, indicating a substantial amount of ferrous material. It should be noted that the feature is not fully covered by the magnetometer data and, as such, the magnetic amplitude should be considered a minimum.			
70364	Magnetic	545117	6232680	A1	-	-	-	255	A large complex magnetic anomaly, comprised of magnetic anomalies ranging in amplitude from 113 to 255 nT. The magnetic variation appears to cover an area of approximately 50 x 34 m, and extends beyond the study area in the north. There is a small, faint debris field (70365) identified on the SSS data which is possibly associated. A second, small, rounded area of disturbed seabed, measuring 4.8 x 3.5 m, is also identified on the SSS data within this area of magnetic variation (at 545113 m E, 6232694 m N). During the SSS interpretation, this was	Zone E	Zone E	E_MAG_0348, E_MAG_0342, E_MAG_0336, E_MAG_0337, E_MAG_0338

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
									deemed to be a natural feature and as such, is not recorded here with its own anomaly number. However, it should be noted that the possibility of this disturbance representing associated items of partially buried debris remains. The complex magnetic anomaly is close to a similar complex magnetic anomaly comprised of anomalies 70366, 70367, 70368 and is therefore possibly related. The area of magnetic variation covers a wider area than the features identified on the SSS data and, as such, it is interpreted as being a spread of ferrous debris items which are either partially buried or have little surface expression.			
70365	Debris field	545103	6232679	A1	6.4	2.3	0.0	120	Small, rounded area of disturbed sediment. Possibly with a fairly indistinct curvilinear dark reflector. Feature corresponds with a large dipole, which forms part of a larger complex magnetic anomaly 70364. Anomaly is close to a similar complex magnetic anomaly comprised of anomalies 70370, 70371, 70372 and therefore possibly related. Possibly a spread of ferrous debris items which are either buried or have little surface expression.	Zone E	Zone E	E_MAG_0335

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
70366	Magnetic	545097	6232653	A1	-	-	-	439	Large dipole identified on the magnetometer data. Feature appears to form part of a much larger, complex magnetic feature along with anomalies 70367 and 70368 in the immediate area. Nothing visible on the SSS or MBES data. Anomaly is close to a similar complex magnetic anomaly 70364 and is therefore likely related. Possibly a spread of ferrous debris items which are either buried or have little surface expression.	Zone E	Zone E	E_MAG_0331
70367	Debris	545083	6232646	A1	2.3	1.6	0.0	816	Small, slightly irregular bright reflector identified on the SSS data. Not particularly distinct but looks a little anomalous. Feature corresponds with a large dipole, which forms part of a larger complex magnetic anomaly along with anomaly numbers 70366 and 70368 in the immediate area. Nothing visible on the MBES data. Anomaly is close to a similar complex magnetic anomaly 70364 and is therefore possibly related. Possibly a spread of ferrous debris items which are either partially buried or have little surface expression.	Zone E	Zone E	E_MAG_0330
70368	Debris field	545075	6232646	A1	7.1	6.6	0.0	498	A small patch of disturbed seabed comprising both high and low reflectivity identified on the SSS data. Feature corresponds with a large dipole, which	Zone E	Zone E	E_MAG_0328

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
									forms part of a larger complex magnetic anomaly along with anomaly numbers 70366 and 70367 in the immediate area. Nothing visible on the MBES data. Anomaly is close to a similar complex magnetic anomaly 70364 and is therefore possibly related. Possibly a spread of ferrous debris items which are either partially buried or have little surface expression.			
70519	Magnetic	549632	6238142	A1	-	-	-	41	Small dipole identified on the magnetometer data. Nothing clearly anthropogenic was identified on the sonar or bathymetry data at this location; however, items of anthropogenic debris were identified at this location during ROV investigations. Two metal pipe/bars were initially uncovered, measuring 2.0 x 0.7 x 0.3 m and 0.7 x 0.4 x 0.3 m. The first was moved to wet store, and then recovered to deck, whilst the second was wet stored at 549585 6238112. A third metal item (A_MAG_0052_B) measured 0.3 x 0.1 x 0.1 m and was recovered to deck. A_MAG_0052_C is an item of suspected archaeological significance measuring 1.0 x 0.5 x 0.3 m and has been left in situ. On second assessment of the area a 12 x 12 m search area was conducted. This revealed several wooden and metal items that could indicate the remains of a shipwreck.	Zone A	Zone A	A_MAG_0030; A_MAG_0052, A_MAG_0052_A, A_MAG_0052_B, A_MAG_0052_C, A_MAG_0052 (Item A), A_MAG_0052 (Item B), A_MAG_0052 (Item C), A_MAG_0052 (Item D), A_MAG_0052 (Item E)

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
									As such, this feature is deemed to be of high archaeological potential.			
70520	Magnetic	549652	6238154	A1	-	-	-	89	Medium dipole, identified on the magnetometer data. Nothing clearly anthropogenic was identified on the sonar or bathymetry data at this location, but items of anthropogenic debris were identified at this location during ROV investigations. An anchor with associated wooden debris was confirmed, measuring 1.8 x 0.4 x 0.2 m. A small metal ring was also observed measuring 0.15 x 0.1 x 0.05 m. The anchor was left in situ, whilst the ring was initially lifted, assessed, and then replaced in the original position. Based to its proximity to feature 70519, it is possible that this is related to the possible shipwreck and, as such, is deemed of high archaeological potential.	Zone A	Zone A	A_MAG_0032; A_MAG_0054, A_MAG_0054_A, A_MAG_0054_B
71025	Mound	540289	6213724	A1	16.9	11	1.1	-	In the MBES data this is visible as a large, mounded feature with uneven height across its extent. The feature goes beyond the data extents and, as such, its dimensions should be considered a minimum. In the SSS data, this is identified as a spread of dark reflectors with height. The feature is outside of the magnetic data coverage and, as such, it is not possible to comment on whether it	ECRM	ECRM	2900 (UKHO), EMU_Geophysics number_95

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic Amplitude (nT)	Description	Dataset	Zone	External references/RPS Anomaly reference number
									comprises ferrous material. The feature appears in line with, and similar in appearance to an area of geological outcropping and is possibly a natural feature. However, the feature was reported as being possible wreck debris during a previous geophysical assessment (EMU_Geophysics number_95) and is possibly associated with a UKHO record (2900) for a collapsed wreck. As such, the feature has been retained here as a precaution, but the possibility of this being a natural feature should be noted.			

Appendix B – Compliance with the Application

DOCUMENT	CHAPTER TITLE/SECTION	DETAILS OF COMMITMENT	WHERE ADDRESSED IN WSI & PAD
EIA Report	Cultural Heritage	Analysis of pre-construction survey data will be undertaken to refine the identified potential marine archaeology assets at infrastructure locations.	Sections 4.7.5 and 4.7.6
EIA Report	Cultural Heritage	Appropriate micro siting allowance for identified assets will be agreed in consultation with HES. Both the micro-siting allowance and exclusion zones will be detailed in the WSI.	Section 4.7.4 (micro-siting) Section 4.5.2 (AEZs)
EIA Report	Cultural Heritage	Turbines will all be of similar dimensions for hub height and blade tip level subject to turbine and substructure design and installation specification.	Confirmed in the Development Specification and Layout Plan.
EIA Report	Cultural Heritage	Turbines will all be pale grey in colour (Light Grey RAL 7035) with a semi-matt finish.	Confirmed in the Development Specification and Layout Plan.