Eastern Green Link 3

Marine Environmental Appraisal

Chapter 14 - Marine Archaeology

Prepared for: Scottish Hydro Electric Transmission plc (SHE-T)

Scottish & Southern Electricity Networks
TRANSMISSION

collaborative environmental advisers

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Abbreviations/Glossary

AD	Anno Domini
AEZ	Archaeological Exclusion Zone
BC	Before Christ
BGS	British Geological Survey
BP	(years) Before Present
EIA	Environmental Impact Assessment
ETRS 89	European Terrestrial Reference System 1989
GIS	Geographic Information System
GW	Giga Watt
HDD	Horizontal Directional Drilling
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
HVDC	High Voltage Direct Current
km	Kilometre
MBES	Multibeam Echo Sounder
MCHA	Marine Cultural Heritage and Archaeology
MD-LOT	Marine Directorate - Licensing Operations Team
MEA	Marine Environmental Assessment
MEAp	Marine Environmental Appraisal
MHWS	Mean High Water Springs
MIS	Marine Isotope Stage
MLWS	Mean Low Water Springs
NM	Nautical Mile
NRHE	National Record of the Historic Environment
nT	Nano Tesla
PAD	Protocol for Archaeological Discovery
PLGR	Pre-Lay Grapnel Run
RSL	Relative Sea Level
ROV	Remotely Operated Vehicle
SBP	Sub-bottom Profiler
SM	Scheduled Monument
SSC	Suspended Sediment Concentration
SSS	Sidescan Sonar
TAEZ	Temporary Archaeological Exclusion Zone
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nation Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation

14. Marine Archaeology

14.1. Introduction

This chapter of the Marine Environmental Appraisal (MEAp) describes the potential impacts arising from the construction, operation and maintenance and decommissioning of the Proposed Development on marine archaeology receptors. For the purposes of seeking the necessary consents, the Eastern Green Link (EGL) 3 Project has been split into different 'Schemes' i.e. English Onshore Scheme, English Offshore Scheme, Scottish Onshore Scheme and the Scottish Offshore Scheme (with the latter hereinafter referred to as 'the Proposed Development'). Collectively all components of EGL3 are referred to as 'the Project'.

A description of the works expected to be undertaken during construction, operation and maintenance and decommissioning of the Proposed Development is provided in **Chapter 3: Project Description**. The Proposed Development, defined spatially by the Red Line Boundary (RLB), includes approximately 145 kilometres (km) of subsea High Voltage Direct Current (HVDC) cables from mean high water springs (MHWS) at the landfall at Sandford Bay, Scotland, to the boundary with adjacent English waters and is nominally 700 metres (m) wide. This width is considered adequate to micro-site around sensitive seabed features or habitats, or to allow for the footprint of installation vessels and is the maximum extent of seabed in which construction and operation of the Proposed Development may take place. The RLB is shown in **Figure 14-1 (Drawing reference 14-1)**.

As set out in **Chapter 1: Introduction**, cable installation and some associated activities beyond 12 nautical miles (NM) are exempt from the requirement to obtain a Marine Licence under the Marine and Coastal Access Act 2009 as well as repair of the installed cable in inshore and offshore waters. This chapter presents an assessment of the effects of the Proposed Development from MHWS at the Sandford Bay landfall to the border with English adjacent waters. This is to provide a holistic view of the Proposed Development and any associated impacts. However, consent is not being sought for the exempt cable (either installation or repair) and only cable protection would be included in the Marine Licence beyond 12 NM.

Kilometre Points (KPs) are used throughout this chapter to provide context as to where within the Study Area a feature lies (see **Section 14.1.1** for definition of Study Area). KP 436 is defined at the border with adjacent English waters, while KP 580 is defined at the proposed landfall in Sandford Bay, Peterhead.

Marine archaeology receptors include: palaeolandscape and submerged prehistory, maritime and coastal remains and aviation remains. Where appropriate, the chapter identifies proportionate measures to avoid or mitigate any predicted adverse effects.

This chapter should be read in conjunction with:

- **Chapter 3: Project Description**;
- **Chapter 4: Marine Environmental Appraisal Scope and Methodology**;
- **Chapter 6: Marine Physical Processes** which identifies the spatial extent of potential impacts from temporary sediment suspension and subsequent redeposition; and

This chapter is supported by the following appendices:

- **Appendix 14A: Marine Archaeology Technical Report**; and
- **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

A separate marine archaeological assessment has been prepared for the English Offshore Scheme which is available as part of the Statutory Consultation documentation for the application for Development Consent (NGET, 2025). A separate terrestrial archaeology assessment will be prepared for the Scottish Onshore Scheme to be submitted with the Planning Application.

14.1.1. Study Area

The Study Area for the marine archaeology baseline assessment includes the RLB and a 2 km buffer measured from its outer boundary, within the marine zone (hereafter referred to in this chapter as the 'Study Area'). The Study Area incorporates the area within which there is potential for indirect impacts associated with the deposition of suspended sediments and is consistent with the conclusions reached in **Chapter 6: Marine Physical Processes.** The Study Area also acts as a precautionary maximum zone of influence (ZoI), as all potential direct and indirect impacts would occur within this buffer.

The Study Area extends to 200 m above MHWS, capturing archaeological data from the nearby terrestrial landscape with the potential to aid characterisation and interpretation of the marine archaeological character and potential for remains. A crossover of the offshore (marine) archaeology and onshore archaeology Study Areas exists within the intertidal zone, where the former extends up to MHWS and the latter down to Mean Low Water Springs (MLWS). Each scope therefore encompasses the intertidal zone. The marine archaeology Study Area is illustrated by **Figure 14-1 (Drawing reference 14-1)**.

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Red Line Boundary and Marine Archaeology Study Area

Drawing No. 14-1

Legend

- Red Line Boundary
- Study Area
- 12 NM Limit
- Scottish Adjacent Waters

0 10 20 30 KM
0 7 14 21 ML
N

Date	22/07/2025
Coordinate System	ETRS 1989 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:584,291
Created	TB
Reviewed	MJ
Authorised	JDM

14.2. Data Sources

The marine archaeology baseline characterisation has been determined based on a review of publicly available information, project-specific survey data and consultation with relevant organisations. This provides a robust, up-to-date characterisation of the archaeological resource within the Study Area in accordance with relevant guidance for this topic.

14.2.1. Site-Specific Survey Data

Primary data has been acquired through a suite of geophysical and geotechnical surveys covering the Proposed Development. The following reports accumulating and interpretating the acquired data were reviewed for the baseline assessment:

- Nearshore Geophysical Survey (NextGeo, 2024a);
- Offshore Geophysical Survey (NextGeo, 2024b);
- Geotechnical Survey (offshore) (NextGeo, 2023);
- Geotechnical Laboratory Testing (nearshore) (NextGeo, 2025a); and
- Integrated Geophysical and Geotechnical Survey Report (NextGeo, 2025b).

In addition, the raw data for Multibeam Bathymetry (MBES), Sidescan Sonar (SSS) and Magnetometer were archaeologically reviewed. These were assessed following best practice professional guidance for marine archaeology including, but not limited to:

- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for Renewable Energy Sector (Gribble and Leather, 2011); and
- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes. 2nd Edition (Historic England, 2025).

Further primary data was acquired through a walkover survey, undertaken at Sandford Bay, Aberdeenshire, on 5 August 2024. Inspection of the intertidal zone within the RLB was undertaken to ground truth the existing heritage records situated therein and identify any new sites, deposits or artefacts of archaeological interest.

Further details of the site-specific survey methodologies can be found in **Appendix 14A: Marine Archaeology Technical Report**.

14.2.2. Publicly Available Data

A desk-based review of publicly available data has also been undertaken to supplement site-specific survey information and to describe the wider environment within the Study Area. **Table 14-1** lists the key data sources which have been used to characterise the marine archaeology baseline but not limited to these sources.

Table 14-1: Key publicly available data sources for marine archaeology

Data source	Description	Reference
British Geological Survey (BGS)	Offshore Regional Reports, detailing the Quaternary (and earlier) sequences of North Sea geologies.	BGS Text Viewer (2025)
	Offshore data and mapping, including geological mapping, geotechnical and geophysical data.	BGS GeoIndex (Offshore) (2025)
United Kingdom Hydrographic Office (UKHO)	Shapefile and text records for charted wrecks and other seabed obstructions considered as navigational hazards.	UKHO (2025)
Historic Environment Scotland (HES)	World Heritage Sites, Historic Marine Protected Areas, Scheduled Monuments, Listed Buildings, Inventory of Historic Battlefields, Gardens and Designed Landscapes, Conservation Areas and Properties in Care records for Scotland.	HES (2025)
Trove (formerly Canmore)	Archaeological and historic environment records for onshore and offshore heritage assets in Scotland.	Trove (2025)
Aberdeenshire Historic Environment Record (HER)	Archaeological and historic environment records for onshore and offshore heritage assets in Aberdeenshire.	Aberdeenshire Council (2025)
National Record of the Historic Environment (NRHE)	Areas of historic environment interest above MHWS in Aberdeenshire, generally derived from Aberdeenshire HER records.	Historic England (2025)

Data source	Description	Reference
Protect military remains	List of wrecks designated under the Protection of Military Remains Act, 1986 (digitised and available online via the government Marine Map portal)	Scottish Government (2025)
Historic Ordnance Survey maps	Illustrating historic land use and coastline form from the late 19th century to present.	(National Library of Scotland, 2025)

All spatial data utilised in forming the marine archaeology baseline was converted to and presented in Universal Transverse Mercator (UTM) Zone 30 North projected from a European Terrestrial Reference System (ETRS) 1989 datum.

In addition, a range of relevant published academic articles, publications and unpublished grey literature reports were reviewed to inform the baseline.

14.3. Consultation

14.3.1. Non-Statutory Scoping

In January 2024, a MEA Non-Statutory Scoping Report was submitted to the Scottish Government - Marine Directorate Licensing Operations Team (MD-LOT) as part of a pre-application consultation exercise for the Proposed Development. Responses to the MEA Non-Statutory Scoping Report from consultees were received on 15 July 2024. No response was received from any stakeholder regarding marine archaeology.

The assessment is therefore provided on the basis of the receptors and effects scoped in within the MEA Non-Statutory Scoping Report.

14.3.2. Other Consultations

Also in January 2024, Historic Environment Scotland (HES), as the stakeholder for marine archaeology in Scottish waters, was invited to attend an informal introductory meeting relating to the Proposed Development. The meeting was held on 16 January 2024, attended by the HES representative. Although not a substitute for formal scoping responses, the key points made by HES are laid out by **Table 14-2**.

Table 14-2: Summary of matters raised during informal meeting with Historic Environment Scotland

Consultee	Summary of matters raised	Response and/or signposting to where considered in this chapter
HES	What is the relative sea level rise in Scotland and implications of that for archaeology?	Relative sea level rise within the RLB throughout the Quaternary and Holocene periods was examined in detail as part of the assessment for submerged archaeological potential in **Appendix 14A: Marine Archaeology Technical Report**. The conclusions informed the identification of marine archaeology receptors and the impact assessment laid out in **Section 14.8** of this chapter.
	Recommended use of HES *Managing Change in the Historic Environment: Setting* guidance for assessing impacts to designated monuments.	Infrastructure of the Proposed Development will not share intervisibility with designated monuments, as recorded by HES. Assessment of the potential for impacts through change to the setting of designated monuments from the Scottish Onshore Scheme will be undertaken in the Scottish Onshore Planning Application.
	HES acts as regulator for works within Scheduled Monuments. The Project would be required to gain written permission from HES. Consent is typically not granted for works within scheduled areas unless those works maintain the asset or improve them.	Consenting process noted. No Scheduled Monument falls within the RLB and consent is therefore understood not to be required for the Proposed Development. Assessment of the potential for impacts to Scheduled Monuments from the Scottish Onshore Scheme will be undertaken in the Scottish Onshore Planning Application.
	HES aims to provide scoping responses within three weeks of receipt, however, current workloads result in responses issued *c.* five weeks from receipt.	Noted during meeting. By the time of writing, no responses to the MEA Non-Statutory Scoping Report had been received from HES (see **Section 14.3.1**).

14.4. Baseline Characterisation

This section presents a summary of the results of the marine archaeology baseline assessment. Full details of the methodology and assessment process can be found in **Appendix 14A: Marine Archaeology Technical Report**.

14.4.1. Overview

14.4.1.1. Submerged prehistory

The North Sea contains prehistoric submarine archaeological remains which date back to almost one million years ago, encompassing the known chronology of hominid activity in the British Isles. The earliest dated remains of hominid activity in Britain, dating to *c*. 970,000 Before Present (years BP), were recovered from the intertidal zone at Happisburgh, Norfolk (Ashton *et al*. 2014). Investigation of this site and others in the vicinity place them in a Middle Pleistocene palaeolandscape characterised by grassland, conifer forest, braided river systems and megafauna (Pathways to Ancient Britain, 2023). No similarly dated remains have been identified within a secure, Scottish context, where confidently dated evidence does not pre-date the Late Upper Palaeolithic (*c*. 12,500 BP). A range of regional studies, both geologically and archaeologically focussed, have been undertaken over the past 60 years to develop understanding of the palaeogeography and how humans and human ancestors may have interacted with the palaeolandscapes of the North Sea.

These studies have shown that the coastline along the southeast of Scotland and northeast of England has the potential for the presence of as-yet undiscovered *in situ* prehistoric sites, artefacts and deposits of palaeoenvironmental interest, located within the inundated nearshore and offshore palaeogeography. Palaeolandscape features such as lake deposits, tunnel valleys, palaeochannels, submerged peat and submerged forests have the potential to contain palaeoenvironmental and archaeological remains.

14.4.1.2. Maritime and intertidal archaeology

Maritime archaeological sites comprise two broad categories: the remains of vessels that have been lost by stranding, foundering, collision, enemy action and other causes and those sites that consist of vessel-related material. Vessel-related material can include (but is not limited to):

- Equipment lost overboard or deliberately jettisoned, such as fishing gear, ammunition and anchors; and
- The only surviving remains of a vessel, such as its cargo or a ballast mound.

Shipwrecks on the seabed provide an insight on the types of vessels used in the past, the nature of shipping activity in the wider area and the changing usage of the marine environment through different periods. Such remains are considered more likely to survive in sediments which promote the preservation of wreck sites (e.g., finer grained sediments that are not subject to high levels of mobility).

14.4.2. Submerged Prehistory

Initial interpretation of the seismic data identified nine Quaternary formations within the RLB. Eight of these were provisionally correlated with the following recognised formations:

- Surficial sediments (Unit 1);
- St Andrews Bay Member, Forth Formation (Units 2A and 2B);
- Largo Bay Member, Forth Formation (Unit 2D);
- Marr Bank Formation (Unit 3);
- Wee Bankie Formation (Unit 4B);
- Coal Pit Formation (Unit 5); and
- Aberdeen Ground Formation (Unit 9).

Subsequent integration of the interpretations from the seismic data and results of the preliminary geotechnical investigations confirmed the presence of several of the above Units. Units 3 and 5 were not described by the integrated report, possibly due to associated deposits lying beyond the depth of core penetration. The baseline assessment, incorporating a wide range of data and studies, highlighted the continued possibility for such deposits to be present (see **Appendix 14A: Marine Archaeology Technical Report**).

Furthermore, Unit 4C was identified by preliminary seismic interpretations and the integrated results as the principal infill of a series of palaeochannels. The geophysical interpretation defined these deposits as distinct from others, however, the baseline assessment postulated that these likely relate to elements of the Marr Bank and/or Wee Bankie formations.

Unit numbering follows on from that of the baseline assessment for the English Offshore Scheme (comprising all elements of the EGL 3 project from the Scottish adjacent waters boundary to MHWS in Lincolnshire; National Grid, 2025), to preserve continuity, therefore the numbering of units within the Proposed Development is not always sequential.

Most provisionally correlated units have been interpreted as marine or glaciomarine in origin, thus precluding the potential for *in situ* archaeological remains relating to prehistory prior to or during the Holocene marine transgression. Units 2A, 2B, 2D, 3, 4B, 4C and 5 have been attributed a negligible or very low archaeological potential.

Unit 1 has been attributed a low archaeological potential. Deposition of related sediments correlates with human activity in Scotland and, although marine deposits would not hold *in situ* remains, *ex situ* artefacts may feasibly be present.

Non-glacigenic deposits hold a broad potential for evidence such as diatoms, ostracods and dinoflagellates, which can be used to infer palaeoenvironmental conditions. Units 3, 4C and 5 have therefore been attributed a very low to moderate potential for palaeoenvironmental remains (elements of Unit 4C may be glacigenic in origin and, therefore, hold very low potential).

A moderate potential for palaeoenvironmental remains was initially identified for Unit 2D, considering the potential for estuarine deposits, previous investigations in the central North Sea having identified such sediments. Stage 1 and 2 geoarchaeological analysis of four cores samples acquired by the Proposed Development from within the RLB, however, identified Unit 2D deposits as likely glaciomarine to marine and warranting no further palaeoenvironmental investigation. This Unit has, therefore, been attributed a low potential for palaeoenvironmental remains. Through the same process, Units 2A and 2B were found to comprise marine sediments only and their initial low to moderate potential for palaeoenvironmental remains was reduced to low.

Unit 1 has been attributed a negligible potential for palaeoenvironmental remains, as this comprises mobile, Holocene marine sediments with no local indication of features such as peat beds or submerged forests.

The Aberdeen Ground Formation (Unit 9) was deposited over a considerable period, spanning a range of depositional environments. As such, the archaeological and palaeoenvironmental potential is particular to each facies. Further analysis is required to characterise Unit 9 and determine the lithology, age and depositional environment(s) of any confidently interpreted Aberdeen Ground Formation deposits. The archaeological and palaeoenvironmental potential for Unit 9 is therefore uncertain.

A summary of the archaeological and palaeoenvironmental potential of the identified and anticipated units within the Study Area is presented by **Table 14-3**.

Table 14-3: Summary of potential for provisionally identified geological units

Unit	Marine Isotope Stage (MIS)	Depositional environment	Potential	
			Prehistoric archaeology	Palaeoenvironmental
1	1	Marine	Low	Negligible
2A	1	Shallow marine	Very low	Low
2B	1	Shallow marine	Very low	Low
2D	2	Glaciomarine to marine	Negligible	Low
3	2	Shallow glaciomarine	Negligible	Low to moderate
4B	2	Glacigenic	Negligible	Very low
4C	2	Glacigenic and/or shallow glaciomarine	Negligible	Very low to moderate
5	6 to 3	Mostly glaciomarine; upper member locally interpreted as intertidal.	Very low	Low to moderate
9	100 to 13	Delta-front/pro-delta/nearshore/open marine; sub-glacial, proximal glaciomarine, distal glaciomarine and marine facies	Uncertain	Uncertain

The Study Area lay beneath glacial ice for much of the Late Quaternary stadials, including the Anglian stage (Marine Isotope Stage (MIS) 12), Wolstonian complex (MIS 10, 8 and 6) and Late Devensian (MIS 2). The Study Area was principally affected by the British-Irish ice sheet, which developed outward from the Scottish Highlands, however, influence may have also come from the Fennoscandian ice sheet, which developed from the mountains of central Norway and Sweden and converged with the British-Irish ice sheet during glacial maxima.

The EMODnet geological database (EMODnet, 2025) maps a series of tunnel valleys and glacial meltwater channels both within the Study Area and nearby, illustrating the impact and aftereffects of glacial ice on the subsea landscape. The RLB traverses a channel system between KP 517 to KP 552 and a system of moraines at KP 458 to KP 461, KP 498 to KP 509 and KP 562 to KP 564.

The moraine formations mapped by the EMODnet data correlate closely with the interpreted distribution of Unit 4B – comprising glacial tills. Unit 4B is identified from KP 450 in the geophysical data, close to where a large moraine traverses the Study Area. The Unit has not been interpreted from KP 515 to KP 561; an area mapped by EMODnet as characterised by a northeast-southwest aligned glacial meltwater system. It is plausible that these channels may have eroded moraine deposits in their path, though the geophysical data

suggests that these were relatively shallow: only a single palaeochannel is identified in this area, at the southernmost margin between KPs 516 and 517.

The BRITICE project (Clark *et al*. 2017) mapped a series of moraines and channels, broadly correlating with the EMODnet data. In addition, a series of parallel moraines are mapped between the glacial meltwater channels from KP 529 to KP 541 and a pattern of smaller moraines are illustrated within and near to the 12 NM zone of the Study Area.

At the landfall, the BRITICE data maps an area of erratics and their pathways within the southern part of the Study Area. An area of lake deposits is mapped within the northern part of the Study Area (at landfall), relating to a former ice-dammed lake. The projected ice dam also enters the Study Area. Beyond the Study Area slightly further inland, the glacial geomorphology is characterised by moraines, drumlins, meltwater channels and additional ice-dammed lakes.

Sea level studies were reviewed to determine when the Study Area may have been subaerially exposed during periods of marine lowstand. Most relevant data available relates to the Late Devensian to Early Holocene. Sea Level Index Points (SLIPs) for earlier periods of the North Sea were limited in their reliability and variably applied local glacio-isostatic adjustment (GIA) calculations. GIA modelling is pertinent and complex to the Study Area, given the proximity and influence of both the British-Irish and Fennoscandian ice sheets.

Sea level modelling produced by Brooks *et al*. (2011) suggests that much of the Study Area had experienced marine inundation prior to *c*. 18,000 BP. The closest *c*. 1.5 km inshore may have remained subaerial at this time, gradually transgressed by the marine environment up to 6,000 BP. Other key studies generally concur with this analysis, including Shennan *et al*. (2018), Peacock *et al*. (2012), Stoker *et al*. (2008) and Sutherland and Gordon (1993).

No heritage records indicate offshore prehistoric sites or finds in Scottish waters and few relate to onshore remains in the Study Area. *In situ* sites and artefacts are unlikely, considering the depositional environment of the provisionally identified units. A slight potential has been identified for *ex situ* artefacts, derived from eroded primary contexts and possibly translocated.

14.4.3. Maritime and Intertidal Archaeology (up to 12 NM)

No designated heritage assets lie within the RLB. Part of one Scheduled Monument and parts of three Conservation Areas lie within the terrestrial part of the Study Area, above MHWS:

- Scheduled Monument:
    - Boddam Castle (Designation Ref: SM3252);
- Conservation Area:
    - Boddam (Designation Ref: CA428);
    - Peterhead Central (Designation Ref: CA427); and
    - Peterhead Roanheads (Designation Ref: CA426).

In addition, 104 Listed Buildings lie within the terrestrial part of the Study Area (above MHWS), within one of the three represented Conservation Areas, with the exception of Buchanness Cottage, Boddam (Des. Ref: LB16366).

Designated heritage assets within the Study Area are illustrated by **Figure 14-2 (Drawing reference 14-2)**. No World Heritage Sites, Historic Marine Protected Areas, sites under the Protection of Military Remains Act 1986, Battlefields, Gardens and Designed Landscapes or Properties in Care are recorded within the Study Area.

There are 17 wreck sites recorded by the UKHO within the Study Area within 12 NM (**Figure 14-3 (Drawing reference 14-3)**). Five of these are recorded as 'dead', indicating that they have not been detected by repeated surveys. Four are recorded as 'lifted', indicating no, or little, remains on the seabed. A further three relate to non-vessel obstructions: one unidentified non-submarine contact (W_123); one loss of shipping containers (W_134); and one foul ground (W_141). Only one (1) UKHO record lies within the RLB (W_147).

The Canmore database illustrates four wreck sites within the Study Area within 12 NM, which do not have correlating UKHO records. Additional Canmore records within 12 NM comprise:

- Two hundred and sixty-eight (268) documented losses or wrecks (including 11 correlating with UKHO records); and
- One hundred and seventy-two (172) intertidal and terrestrial sites.

The Aberdeenshire HER illustrates 309 documented losses or wrecks up to 12 NM, including nine (9) with correlating UKHO and Canmore records and four with correlating Canmore records only. Two hundred (200) HER records are situated within the Study Area above MHWS, many correlating with Listed Building records.

Eight (8) NRHE records also lie wholly or partly within the Study Area above MHWS, mostly correlating with HER records.

Review of the project-acquired geophysical data identified within the RLB (within 12 NM):

- One (1) high potential geophysical anomaly;
- Three (3) medium potential anomalies;
- Seventy-one (71) low potential anomalies; and
- Six hundred and fifty-two (652) magnetic anomalies.

High potential anomalies are likely to represent wrecks, whilst medium potential anomalies have been identified as possible wreck-related material or debris. Low potential anomalies are likely anthropogenic in origin but of limited to no archaeological interest.

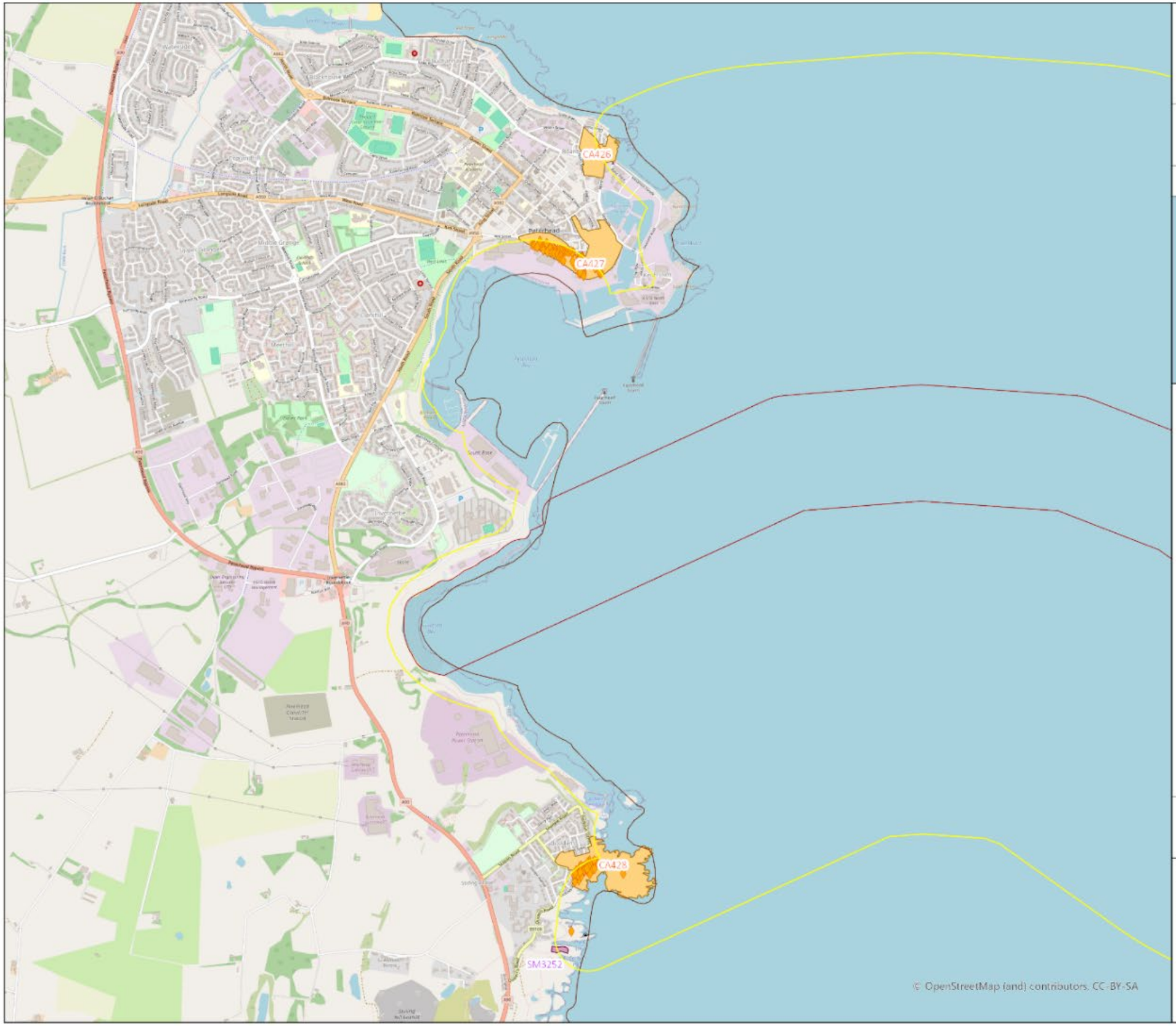
Magnetic anomalies are generally anthropogenic in origin, however, these may also represent geological features. Magnetic anomalies may therefore be of archaeological interest.

A greater proportion of geophysical and magnetic anomalies are arranged close to Peterhead Bay. Such a pattern is to be expected, given the greater volume of maritime traffic in this zone. A greater potential for wreck and wreck-related debris also exists here, in consideration of the proximity to obstructions such as structures, shallows and beaches. All high and medium potential anomalies within 12 NM are situated close to Peterhead Bay.

Three (3) HER records were identified within the intertidal zone of the RLB. One (1) of these records relates in part to the remains of a stone jetty noted during the walkover survey (TI_002). Another of the HER records may also relate to this structure. Other features and artefacts identified during the walkover survey comprise:

- Part of an embedded iron pipe (TI_001);
- An iron spike driven into a large stone, possibly formerly used as a mooring point (TI_003);
- A stamped brick (TI_004); and
- A fragment of wood, possibly representing an element of wreckage or naturally occurring driftwood (TI_005).

The intertidal assets are presented by **Figure 14-4 (Drawing reference 14-4)**.



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Designated Heritage Assets in the Study Area

Drawing No. 14-2

Legend

- Red Line Boundary
- Study Area
- Scottish Adjacent Waters
- 12 NM Limit
- Listed Building
- Scheduled Monument
- Conservation Area

0 0.5 0.9 1.4 KM
0 0.3 0.5 0.8 ML

N

Date	22/07/2025
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Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:22,783
Created	TB
Reviewed	MJ
Authorised	JDM

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6400000 6350000 6300000 6250000

W_135 W_128 W_125 W_127 W_136 W_130 W_142 W_123 W_140 W_143 W_122 W_144 W_121 W_147 W_139 W_120 W_137 W_132 W_133

Turbot Bank Marine Protected Area

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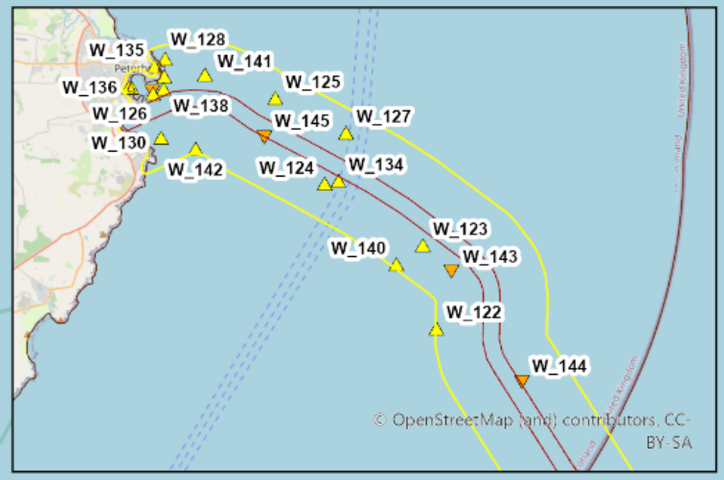
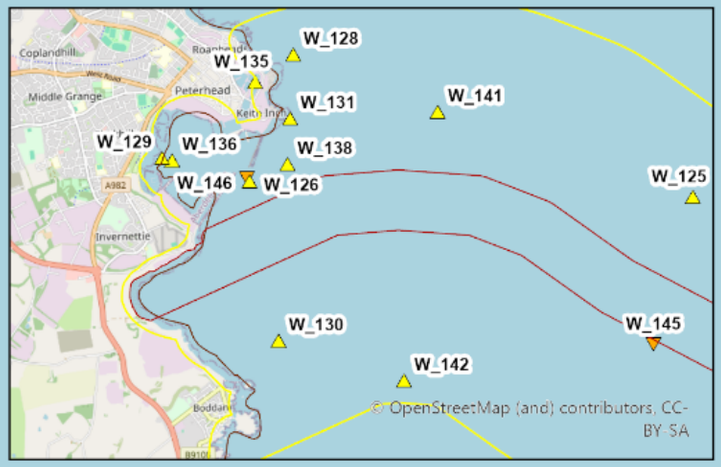
Seagreen Offshore Wind Farm





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UKHO and Canmore Wrecks in the Study Area

Drawing No. 14-3

Legend

- Red Line Boundary
- Study Area
- 12 NM Limit
- Scottish Adjacent Waters
- Canmore wreck record
- UKHO record

0 10 20 30 KM
0 7 14 21 ML

N

Date	22/07/2025
Coordinate System	ETRS 1989 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:584,291
Created	TB
Reviewed	MJ
Authorised	JDM

MSDS Heritage
MSDS Marine

nationalgrid
Scottish & Southern Electricity Networks
TRANSMISSION

Heritage Assets within the Intertidal Zone of the Red Line Boundary

Drawing No. 14-4

Legend

- Red Line Boundary
- Study Area
- 12 NM Limit
- Scottish Adjacent Waters
- Intertidal asset

0 0.1 0.2 0.3 KM
0 0.1 0.1 0.2 ML
N

Date	22/07/2025
Coordinate System	ETRS 1989 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:4,883
Created	TB
Reviewed	MJ
Authorised	JDM

14.4.4. Maritime Archaeology (beyond 12 NM)

There are currently no records within the Study Area beyond 12 NM that are subject to statutory protection as Scheduled Monuments, Protected Wrecks, Historic Marine Protected Areas or under the Protection of Military Remains Act 1986.

Six (6) wreck sites are recorded by the UKHO within the Study Area beyond 12 NM (**Figure 14-3 (Drawing reference 14-3)**). One (1) of these is recorded as 'dead'. One (1) other is described as aircraft wreckage and is discussed further in the below section.

The Canmore database illustrates one (1) wreck site beyond 12 NM without a correlating UKHO record (W_147). A further 13 documented loss or wreck sites are recorded in this area by Canmore, nine (9) relating to UKHO records, including three instances of two Canmore records per correlating UKHO record.

The Aberdeenshire HER illustrates five (5) documented losses or wrecks within the Study Area (Scottish waters beyond 12 NM). One (1) of these correlates with a UKHO record (W_120) and another with a Canmore record (W_147).

Review of the project-acquired geophysical data identified within the RLB (beyond 12 NM):

- One (1) medium potential anomaly;
- Six (6) low potential anomalies; and
- Twenty-nine (29) magnetic anomalies.

14.4.5. Aviation Archaeology

One (1) UKHO record relates to wreckage spotted from a helicopter in 1978, located close to the Scottish adjacent waters boundary and outside of the RLB (**Figure 14-3 (Drawing reference 14-3)**; W_133). Subsequent survey failed to relocate the remains and the UKHO record does not provide evidence to suggest that the wreckage belonged to an aircraft or if this reference was derived from the nature of the initial, and only, observation.

Three (3) aircraft loss records held by Canmore have been identified within the Study Area; two within 12 NM (also within the RLB) and one beyond. The latter correlates with W_133. No further crash sites are recorded by the HER.

The two remaining records relate to documented losses, where the positional data is unreliable and serves only to provide an indication of the types of aircraft that flew over this coastline. In many cases, these locations are only a set of general coordinates, a general distance and bearing from a landmark, the location of the crew's dinghy or the recovered remains of crew or aircraft.

The hinterland of Peterhead, Scotland, was home to several airfields, operational during both World Wars, resulting in significant aircraft traffic in the area during the first half of the 20th century. One HER record above MHWS relates to the site of the former First World War seaplane base at Peterhead.

14.4.6. Summary of Baseline Characterisation

Nine (9) Quaternary geological units have been identified or suggested within the Study Area by the baseline assessment (partly informed by the preliminary seismic interpretation and correlation of these interpretations with the geotechnical results).

The identified units generally represent a succession of glaciomarine and temperate marine depositional environments, suggesting a very low potential for *in situ* archaeological remains to be contained within. A slight potential for redeposited archaeological remains within secondary contexts may be considered, however, the wider body of evidence suggests this may be unlikely.

The Units generally have been attributed a low or low to moderate potential for containing palaeoenvironmental evidence. A slightly greater potential was initially identified for Unit 2D deposits, however, subsequent geoarchaeological analysis of core samples identified this Unit as glaciomarine to marine sediments of low palaeoenvironmental potential. Glacigenic deposits of Units 4B and 4C and modern marine deposits of Unit 1A have been attributed very low and negligible potential, respectively.

The assessment has identified 998 non-designated heritage assets within the Study Area, comprising:

- Twenty-three (23) UKHO records;
- Two hundred and eighty-one (281) Canmore maritime records;
- One hundred and seventy (170) Canmore point records;
- Two (2) Canmore area records;
- Two hundred (200) Aberdeenshire HER records;
- Three hundred and fourteen (314) HER records for maritime losses (documented losses); and
- Eight (8) NRHE areas.

The walkover survey identified two structures relating to an HER record (a stone jetty and mooring fixture) and a single wooden element possibly representing part of a wreck (may alternatively be naturally occurring driftwood).

The assessment of geophysical data identified:

- One (1) high potential anomaly (likely a wreck);
- Four (4) medium potential anomalies (possibly representing debris or parts of wreck);
- Seventy-seven (77) low potential anomalies (likely representing anthropogenic material of limited to no archaeological interest); and
- Six hundred and eighty-one (681) magnetic anomalies without correlating seabed features.

A broader potential for debris, wreckage and lost cargo is suggested by the numerous documented loss records within the Study Area, dating from the 17th to 21st centuries, and evidence of coastal habitation from at least the Neolithic period.

No known aircraft crash sites lie within the Study Area, though three aircraft documented losses are reported. There is a limited potential for remains to be present, in consideration also of nearby early to mid-20th century aviation activities.

14.5. Potential Pressure Identification and Zone of Influence

14.5.1. Spatial Scope

The Study Area for marine archaeology includes the RLB and a 2 km buffer measured from its outer boundary, within the marine zone. This is consistent with **Chapter 6: Marine Physical Processes** and acts as a precautionary maximum ZoI. The ZoI incorporates the area within which there is potential for indirect impacts associated with the deposition of suspended sediments

The majority of increased suspended sediments resulting from activities of the Proposed Development would be redeposited atop, adjacent to or within 10 m of the location of sediment release. At maximum peak flow speed (1.05 m/s), very fine- to medium-grained sands (125 to 500 µm) would settle within 500 m of the sediment release location. Only fines (<63 µm) would settle beyond this, up to 4.6 km. The size of sediment grains and volume of the plume will decrease with distance from the sediment release location.

Fines are not considered likely to be redeposited in such concentrations as to have the potential to impact marine archaeology receptors beyond 2 km.

14.5.2. Temporal Scope

The temporal scope of the assessment of marine archaeology is consistent with the period over which the Proposed Development would be carried out. It assumes construction of the Proposed Development would commence at the earliest in 2028 with the latest possible completion by 2033. Within this window, construction (including pre-lay activity) is expected to take 55 months. Operation would commence in 2033, with periodic maintenance required during the operational phase. It is assumed that maintenance and repair activities could take place at any time during the life span of the Proposed Development.

The Proposed Development is expected to have a life span of more than 40 years. If decommissioning requires cessation of operation and removal of infrastructure at this time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of two years. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, based on the information available, the Applicant has concluded that impacts from decommissioning would be no greater than those during the construction phase. Furthermore, should decommissioning take place, it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken and a separate Marine Licence would be sought for decommissioning activities.

14.5.3. Identification of Pressure-Receptor Pathways

Table 14-4 provides a summary of the receptors scoped into the assessment and the potential impacts assessed. The scoping in of these impacts are based on the potential impacts identified within the marine archaeology MEA Non-Statutory Scoping Report. This took a precautionary approach, whereby some impacts were scoped 'in' to the assessment if a strong evidence base to scope the impact 'out' was lacking. No consultation response to the MEA Non-Statutory Scoping Report was received from stakeholders as to the impacts to be scoped in/out for marine archaeology, therefore, the impacts assessment herein reflect those proposed at scoping.

Table 14-4: Justification for the Zone of Influence assigned to potential impacts scoped in for the marine archaeology assessment

Potential Impact	Associated Project Activities	Project Phase	Receptor	Zone of Influence	Reason for Consideration
Direct impacts, resulting in damage and/or loss.	Boulder clearance, PLGR, pre-sweeping of sand waves. Cable burial and trenching. Placement of external cable protection. HDD drive path and entry/exit pits. Anchoring/jack-up legs.	Construction	Sub-seabed deposits of palaeoenvironmental potential. Known archaeological sites and high/medium potential geophysical anomalies. Low potential geophysical anomalies. Magnetic anomalies. Unknown archaeological sites and remains.	Within RLB	Any disturbance of the seabed from construction activities could directly impact marine archaeology receptors. These effects are likely to be localised, but should they occur, they could lead to adverse and irreversible damage to known or previously undiscovered heritage assets.
	Cable/cable protection repair/replacement. Anchoring/jack-up legs.	Operation			Localised repair/replacement works to cables or remedial external cable protection may be required. Although assets may have been identified prior to or during pre-construction and construction, further assets may remain undetected. Where operational and maintenance activities extend beyond the footprint of previous works, undetected assets may experience impacts.
	Removal of infrastructure. Anchoring/jack-up legs.	Decommissioning			Removal of infrastructure may be required as part of the decommissioning phase. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience impacts.
Deposition of suspended sediment (indirect impact).	Boulder clearance, PLGR, pre-sweeping of sand waves. Cable burial and trenching. Placement of external cable protection. HDD drive path and entry/exit pits.	Construction	Known archaeological sites and high/medium potential geophysical anomalies. Low potential geophysical anomalies. Magnetic anomalies. Unknown archaeological sites and remains.	<4.6 km	Activities interacting with the seabed have the potential to mobilise sediments which may subsequently travel before redepositing. Redeposited sediments, if in sufficient volume, may compact and damage marine archaeology receptors. Redeposited sediment may alternatively result in beneficial impacts, through the additional protection of sediment cover.
	Cable/cable protection repair/replacement.	Operation		Within RLB	
	Removal of infrastructure.	Decommissioning		Within RLB	
Sediment removal (indirect impact).	Boulder clearance, PLGR, pre-sweeping of sand waves. Cable burial and trenching. HDD drive path and entry/exit pits.	Construction	Sub-seabed deposits of palaeoenvironmental potential. Known archaeological sites and high/medium potential geophysical anomalies. Low potential geophysical anomalies. Magnetic anomalies. Unknown archaeological sites and remains.	Within RLB	Activities involving sediment removal have the potential to destabilise marine archaeological remains which have previous been supported by these sediments or expose remains to subsequent impacts from natural processes, leading to damage to and/or loss of these remains.
	Cable/cable protection repair/replacement.	Operation			
	Removal of infrastructure.	Decommissioning			
Scour around	Placement of external cable protection. Anchoring/jack-up legs.	Construction	Sub-seabed deposits of palaeoenvironmental potential.	Within RLB	Altered hydrodynamic processes may occur around infrastructure and vessel anchors, potentially resulting in the removal of deposits

Potential Impact	Associated Project Activities	Project Phase	Receptor	Zone of Influence	Reason for Consideration
installations and anchors (indirect impact).	Cable/cable protection repair/replacement. Anchoring/jack-up legs.	Operation	Known archaeological sites and high/medium potential geophysical anomalies. Low potential geophysical anomalies. Magnetic anomalies. Unknown archaeological sites and remains.		of palaeo-environmental interest and destabilising nearby assets (which may lead to subsequent harm).
	Anchoring/jack-up legs.	Decommissioning			

14.5.4. Guidance

The marine archaeology assessment has been undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The guidance and standards which relate to this assessment are:

- *Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland* (HES and NatureScot, 2018);
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (CIfA, 2020);
- *Designation Policy and Selection Guidance* (HES, 2019a);
- *Historic Environment Scotland Circular: Regulations and Procedures* (HES, 2019b);
- Historic Environment Scotland's "Managing Change in the Historic Environment" series, particularly *Conserving Our Underwater Heritage* (HES, 2025);
- *Key Agencies Group National and Major Developments: An Agency Joint Statement on Pre-application Engagement* (NatureScot, 2025);
- Scottish Government Planning Advice Notes, in particular 2/2011: Planning and Archaeology; Planning Advice Note 1/2013: Environmental Impact Assessment (amended 2017; Scottish Government, 2013); Planning Circular 1/2017: Environmental Impact Assessment Regulations (Scottish Government, 2017);
- *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS, 2011).
- *Code of Practice for Seabed Development* (Joint Nautical Archaeology Policy Committee, 2008);
- *Historic Environment Guidance for the Offshore Renewable Energy Sector*; (Wessex Archaeology, 2007);
- *Marine Geophysics: Data Acquisition, Processing, and Interpretation Guidance Notes (2nd Edition)* (Historic England, 2025);
- *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector* (Gribble and Leather, 2011);
- *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (The Crown Estate, 2021); and
- *Protocol for Archaeological Discoveries: Offshore Renewables Projects* (The Crown Estate, 2014).

14.6. Key Parameters for Assessment

14.6.1. Realistic Worst-Case Design Scenario

The assessment has followed the Rochdale Envelope approach as outlined in **Chapter 3: Project Description**. The assessment of effects has been based on the description of the Proposed Development and parameters outlined in **Chapter 3: Project Description**. Where there is uncertainty regarding a particular design parameter, the realistic worst-case design parameters are provided in **Table 14-5** and **Table 14-6**, below, with regards to marine archaeology receptors along with the reasons why these parameters are considered worst-case. The assessment for marine archaeology has been undertaken on this basis. Effects of greater adverse significance are not likely to arise should any other development scenario (e.g., different infrastructure layout within the RLB), to that assessed here, be taken forward in the final design plan, provided the development scenario is within the Rochdale Envelope parameters set out.

The worst-case scenarios for indirect impacts arising from changes to increased suspended sediment concentration have been further informed by **Chapter 6: Marine Physical Processes**. Specific parameters were not available to inform the potential extent of scour, however, any such occurrences were concluded only at infrastructure crossings (due to use of cable protection) and with an overall low potential.

Table 14-5: Summary of worst-case scenario during cable construction phase

Activity	Worst-case scenario
Boulder clearance	Total area of impact: 0.85 km^2 (50 km (l) x 0.017 km (w))
	Maximum depth of penetration (below seabed): 2 m
Pre-Lay Grapnel Run (PLGR)	Total area of impact: 4.35 km^2 (145 km (l) x 0.030 km (w))
Trial trenching	Total area of impact: 0.08 km^2 (5 km (l) x 0.016 km (w))

Activity	Worst-case scenario
	Maximum depth of penetration (below seabed): 2.5 m
Sandwave clearance	Total area of impact: 0.07 km^2 (3.5 km (l) x 0.020 km (w))
Landfall enabling works and cable pull-in	Maximum dimensions of exit pit: 75 m x 15 m
	Maximum number of exit pits: 3
Cable burial	Indicative length of cable to be buried: 145 km
	Maximum depth of trench: 2.5 m (below seabed level)
	Width of cable burial equipment: 16 m
	Indicative area of cable burial: 2.32 km^2
Cable protection	Indicative length of cable requiring cable protection: 10 km
	Maximum width of cable protection on seabed: 10 m
	Maximum footprint of cable protection on seabed: 0.1 km^2
Infrastructure crossings	Number of cable crossings required: 7
	Maximum footprint of cable crossings on seabed: 0.035 km^2
Disturbance of seabed increasing suspended sediment concentration	30% of disturbed sediment volume redeposited atop or adjacent to sediment release location
	High volumes of redeposited sediment within 5 to 10 m of sediment release location

Table 14-6: Summary of worst-case scenario during cable decommissioning phase.

Activity	Worst-case scenario
Landfall	No greater than construction.
Offshore cable	Up to all cable out to 12 NM would be removed.

14.7. Embedded Mitigation Measures

As set out in **Chapter 4: Marine Environmental Appraisal Scope and Methodology**, embedded mitigation measures form part of the design for which consent is sought and can be characterised as 'design measures' or 'control and management measures.' This embedded mitigation would be implemented as part of the Proposed Development and secured by way of a condition in the Marine Licence, as relevant.

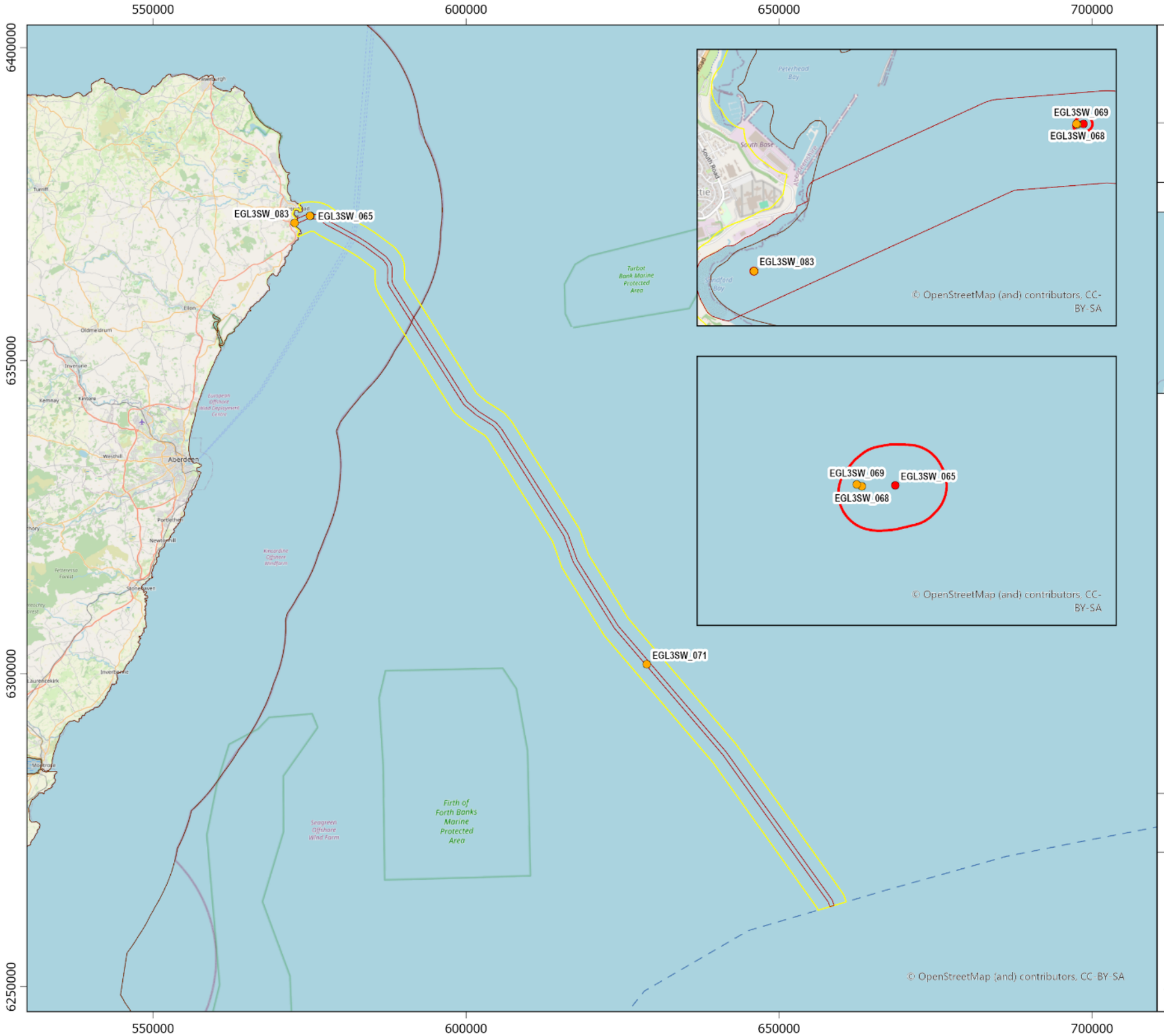
Several management plans would be provided to discharge Marine Licence conditions prior to the start of construction. These would include a Construction Environmental Management Plan (CEMP), a Marine Pollution Contingency Plan (MPCP) Marine Mammal Mitigation Plan (MMMP) and a Fisheries Management and Mitigation Plan (FMMP). These documents will outline measures to be implemented to comply with legislation, such as Prevention of Pollution at Sea (MARPOL) and Safety of Life at Sea (SOLAS), and the mitigation commitments proposed within this MEAp (Embedded Mitigation OMT08). An Outline CEMP is provided as **Appendix 3B: Outline Construction Environmental Management Plan**. In addition, design measures identified through the MEAp process have been applied to avoid or reduce potential significant effects, including the application of Archaeological Exclusion Zones (AEZs; **Figure 14-5 (Drawing reference 14-5)**).

Table 14-7 outlines the embedded mitigation measures that would be implemented for the Proposed Development that have been considered by the marine archaeology MEA. Further detail of the embedded mitigation measures is presented by **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries.**

Table 14-7: Embedded mitigation measures for marine archaeology

Impact pathway	Receptor(s)	Embedded Mitigation Measures
Construction, Operation and maintenance and	Known archaeological sites and high/medium potential geophysical anomalies	MA01 - Archaeological Exclusion Zones (AEZs) and Temporary Archaeological Exclusion Zones (TAEZs) will be implemented around identified (known) and potential marine archaeological receptors. The extent of exclusion zones will be determined by the potential significance of the receptor, the seabed dynamics, the potential impacts and extent of any outlying debris. The AEZs will be agreed with

Impact pathway	Receptor(s)	Embedded Mitigation Measures
decommissioning activities		the Archaeological Curator (the stakeholder for marine archaeology; see **Section 14.3.2**)) and will remain for the lifetime for the Proposed Development or an until further works are undertaken to allow re-assessment.
	Sub-seabed deposits of palaeoenvironmental potential; known archaeological sites and high/medium potential geophysical anomalies; low potential geophysical anomalies; magnetic anomalies; unknown archaeological sites and remains	MA02 - The Proposed Development will retain the services of an archaeological consultant, the 'Retained Archaeologist', to implement the Written Scheme of Investigation (WSI). The Retained Archaeologist will provide guidance as to the requirements for archaeological assessment of further pre-construction surveys and the specifications of such surveys. This can include, but is not limited to, geophysical, hydrographic, Remotely Operated Vehicle (ROV), diver and geotechnical surveys. The Retained Archaeologist will provide input into site preparation, pre-construction and construction activities where appropriate and where archaeological monitoring of such works may be required.
	Sub-seabed deposits of palaeoenvironmental potential; unknown archaeological sites and remains	MA03 - The archaeological assessment of geotechnical samples will be undertaken as necessary, informed by the interpretated potential of the marine archaeology Study Area. The archaeological assessment of geotechnical samples will be preceded by a Method Statement and will follow a staged process after *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector* (Gribble and Leather, 2011).
	Sub-seabed deposits of palaeoenvironmental potential; known archaeological sites and high/medium potential geophysical anomalies; low potential geophysical anomalies; magnetic anomalies; unknown archaeological sites and remains	MA04 - The Protocol for Archaeological Discoveries (PAD) will follow best practice outlined in *Protocol for Archaeological Discoveries: Offshore Renewables Projects* (The Crown Estate, 2014). The PAD provides the mechanism for the reporting of unexpected finds of potential archaeological interest, and the subsequent treatment of such finds. The PAD does not replace archaeological processes but enhances the protection for the historic environment. The PAD also provides additional mitigation for geophysical anomalies interpreted as of low archaeological potential.
	Sub-seabed deposits of palaeoenvironmental potential; known archaeological sites and high/medium potential geophysical anomalies; low potential geophysical anomalies; magnetic anomalies; unknown archaeological sites and remains	MA05 - The Written Scheme of Investigation (WSI) will follow the best practice as outlined in *Archaeological Written Schemes of Investigation for Offshore Windfarm Projects* (The Crown Estate, 2021). The WSI will: ▪ Set out the roles and respective responsibilities of the Applicant, contractors and Retained Archaeologist and Archaeological contractor(s); ▪ Outline the known and potential archaeological receptors that could be impacted by the Proposed Development; ▪ Set out the importance of research frameworks in setting objectives that may be delivered through realisation of the known and potential archaeology; ▪ Outline the agreed mitigation and archaeological actions that are to take place in various circumstances; and ▪ Provide methodologies for these archaeological actions, to be employed on archaeological work conducted in the post-consent period.



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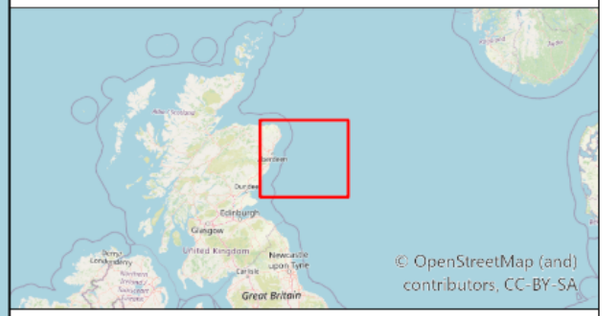
Archaeological Exclusion Zones

Drawing No. 14-5



Legend

- Red Line Boundary
- Study Area
- 12 NM Limit
- Scottish Adjacent Waters

Geophysical anomaly

- High
- Medium

- Archaeological Exclusion Zone

0 10 20 30 KM
0 7 14 21 ML
N

Date	22/07/2025
Coordinate System	ETRS 1989 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:584,291
Created	TB
Reviewed	MJ
Authorised	JDM

14.8. Significance Assessment

14.8.1. Introduction to the Assessment

The criteria for characterising the value and sensitivity and magnitude for marine archaeology are outlined in **Table 14-9**, **Table 14-10** and **Table 14-11**, respectively. The significance of an effect, either adverse or beneficial, has been determined using a combination of the magnitude of the impact and the sensitivity of the receptor. A matrix approach (see **Table 14-12**) is used throughout all topic areas to ensure a consistent approach within the assessment. This assessment will use available evidence, professional judgement and knowledge of the marine archaeological resource to determine the level of impact.

The assessment of sensitivity is made with consideration of the vulnerability of the receptor to an impact and its ability to recover and adapt. Vulnerability can differ between different marine archaeology receptors and will also vary depending on the impact pathway.

The assessment of magnitude is made with consideration of the extent of the area impacted, the duration and frequency of the impact and the scale of the change, i.e., whether it has an effect at local or wider level. When determining the magnitude of impacts, the life history and ecology of the receptors is important. Factors such as seasonality of presence or whether specific areas are required for a certain life stage which the species may be unwilling or unable to move away from are considered.

Both sensitivity and magnitude of change are influenced by the value, or significance, of a receptor as a heritage asset, which will be defined prior to the assessment of impact significance.

A summary of the impact assessments undertaken by the marine archaeology MEA is presented in **Table 14-8**.

Table 14-8: Summary of impact assessments for marine archaeology

Assessment	Section where assessment undertaken		
Direct impacts	**Construction-related**	**Operation-related**	**Decommissioning-related**
Sub-seabed deposits of palaeoenvironmental potential	14.8.2.1	14.8.2.6	14.8.2.11
Known archaeological sites and high/medium potential geophysical anomalies	14.8.2.2	14.8.2.7	
Low potential geophysical anomalies	14.8.2.3	14.8.2.8	
Magnetic anomalies	14.8.2.4	14.8.2.9	
Unknown archaeological sites and remains	14.8.2.5	14.8.2.10	
Indirect impacts	**Construction-related**	**Operation-related**	**Decommissioning-related**
Sub-seabed deposits of palaeoenvironmental potential	14.8.3.1	14.8.3.6	14.8.3.11
Known archaeological sites and high/medium potential geophysical anomalies	14.8.3.2	14.8.3.7	
Low potential geophysical anomalies	14.8.3.3	14.8.3.8	
Magnetic anomalies	14.8.3.4	14.8.3.9	
Unknown archaeological sites and remains	14.8.3.5	14.8.3.10	

14.8.1.1. Value

The UK Marine Policy Statement (HM Government, 2011) describes a heritage asset (including archaeological receptors) as holding a degree of significance (value) meriting consideration, where significance relates to the heritage interest of an asset and the value they hold for present and future generations.

Both designated and non-designated heritage assets can hold heritage value. Value considers whether the receptor is rare, has protected status or has importance at a local, regional, national or international level. Designated assets, such as Historic Marine Protected Areas (Scotland), have been assigned the highest level of value. The value of non-designated heritage assets can be

determined through professional interpretation of the values or characteristics of the asset. These factors vary in their wording slightly between England and Scotland and are listed below.

Historic Environment Scotland's *Designation Policy and Selection Guidance* (2019) states that:

"*Decisions affecting any part of the historic environment should be informed by an inclusive understanding of its breadth and cultural significance*."

HES recommends use of the following valuation criteria to determine cultural significance:

- Intrinsic characteristics: how the physical remains of an asset contribute to our knowledge of the past;
- Contextual characteristics: how an asset relates to its surroundings and/or to our existing knowledge of the past; and
- Associative characteristics: how an asset relates to people, practices, events and/or historic and social movements.

As part of the assessment, receptors will be attributed value alongside the HES guidance documents and terminology, to contribute to the assessment of sensitivity (see below).

The value of known archaeological assets will be assessed on a five-point scale, using professional judgement informed by criteria provided in **Table 14-9**.

Table 14-9: Criteria to assess the heritage value of receptors

Value	Definition
High	Internationally or nationally important. Within a marine or intertidal context, high value heritage assets can include: ▪ World Heritages Sites and assets of acknowledged international importance or that can greatly contribute to international research objectives; ▪ Sites designated under national legislation, i.e. Scheduled Monuments, Protected Wreck Sites, Historic Marine Protected Areas; and ▪ Buildings designated under the Planning (Listed Buildings and Conservation Areas) Act 1990 (England) or Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Additionally, any remains which are not currently designated but have equivalent significance to a designated asset are considered to be of high value.
Medium	Within a marine or intertidal context, medium value assets include: ▪ Heritage assets that are not designated and that do not meet the criteria for designation, but display notable values or characteristics; and ▪ Heritage assets, groups of assets or landscapes that contribute to regional research objectives.
Low	Within a marine or intertidal context, low value assets include: ▪ Heritage assets displaying limited values or characteristics; and ▪ Heritage assets, or groups of assets, that contribute to a limited degree to regional research objectives.
Negligible	Within a marine or intertidal context, negligible value assets include: ▪ Heritage assets with very little or no surviving archaeological interest and little or no heritage value or characteristics; and ▪ Heritage assets or groups of assets that cannot appreciably contribute to regional research objectives.
Uncertain	Assets for which the importance of the resource has not been or cannot be ascertained.

While a designation (e.g. as a Scheduled Monument, Listed Building, etc.) indicates that a receptor has been identified as being of high value, non-designated archaeological assets are not necessarily of lesser value. Non-designated receptors that can be demonstrated to be of equivalent value to designated sites would be of equivalent significance, as included within **Table 14-9**.

The nature of the marine archaeological resource is such that there is a high level of uncertainty concerning remains on the seabed. Often data regarding the nature and extent of assets are limited or out of date and the precautionary principle will be applied to all aspects of archaeological impact assessment in the MEAp.

14.8.1.2. Sensitivity

The sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. Sensitivity is determined by consideration of the value, adaptability, tolerance and recoverability of a receptor. These criteria are determined through professional judgement and relevant experience and are described further below:

- Value: a measure of the receptor's heritage significance (criteria and specific assessment methodology detailed above);
- Adaptability: the ability of a receptor to adapt to or avoid an external factor;
- Tolerance: the susceptibility (ability to be affected or unaffected) of a receptor to an external factor; and
- Recoverability: the ability of a receptor to return to a state close to that which existed before the activity or event caused change within a specific period of time.

The guidelines presented in **Table 14-10** will be adopted in the MEAp to define the sensitivity of a receptor.

Table 14-10: Sensitivity levels for receptors

Sensitivity	Description
High	Receptor has very limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Medium	Receptor has limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Low	Receptor has some tolerance to avoid, adapt to, accommodate or recover from the anticipated impact.
Negligible	Receptor is generally tolerant to and can accommodate or recover from the anticipated impact.

The National Planning Policy Framework (NPPF, 2024) states that heritage assets should be recognised as "*an irreplaceable resource*" and that efforts should be made to "*conserve them in a manner appropriate to their significance*".

Heritage receptors cannot typically adapt, tolerate or recover from direct impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor is predominantly quantified only by their value. Where receptors can adapt to, tolerate or recover from indirect impacts, these factors will be incorporated into an assessment of their sensitivity as part of the MEA.

In some instances, the value of a receptor is recognised by means of designation and the 'value' element recognises and gives weight in the assessment to that designation. However, irrespective of the recognised value, all receptors will exhibit a greater or lesser degree of sensitivity to the potential changes brought about by the Proposed Development. The assessment of sensitivity is a matter of judgement applied using professional expertise, based on the receptors and impacts identified within the Study Area.

14.8.1.3. Magnitude of change

The magnitude of change is defined by the level of alteration to a receptor resulting from project-related impacts, as measured from that receptor's baseline state and condition, alongside environmental factors and natural variability. The assessment of magnitude will consider both positive and negative changes to a receptor.

The criteria to be used in the assessment are set out in **Table 14-11**. Definitions have been established with reference to key documentation, including the UK Marine Policy Statement (HM Government, 2011) and *Scotland's National Marine Plan* (Marine Scotland, 2015).

Table 14-11: Magnitude of change definitions

Magnitude of change	Definition	
	Positive change (beneficial)	Negative change (adverse)
High	▪ Large scale improvement of asset or attribute quality; and/or ▪ extensive restoration or enhancement.	▪ Substantial loss or harm to the heritage asset and/or integrity of the heritage asset or severe damage to key characteristics, features or elements, such that the heritage asset is lost or its significance is totally altered; and/or ▪ Permanent/irreplaceable change which is certain to occur.
Medium	▪ Improvement to, or addition of, key characteristics, features or elements of the resource; and/or ▪ Improvement to attribute quality.	▪ Loss of, or alteration to, key characteristics, features or elements; and/or ▪ Measurable change in significance, attributes, quality or vulnerability, such that the heritage asset and its significance is altered.
Low	▪ Minor improvement to, or addition of, one or a small number of characteristics, features or elements; and/or	▪ Minor loss of, or small alterations to, one or a small number of characteristics, features or elements; and/or ▪ Noticeable change in attributes, quality or vulnerability.

Magnitude of change	Definition	
	Positive change (beneficial)	Negative change (adverse)
	▪ Very minor improvement to attribute quality.	
Negligible	No change or unquantifiable change to the receptor and its significance.	

14.8.1.4. Significance of impact

The significance of an impact on a heritage receptor, whether a direct or indirect impact, is determined by correlating the sensitivity of the archaeological receptor (**Table 14-10**) and the magnitude of the change (**Table 14-11**). The impact will be presented as of major, moderate, minor or negligible significance and can be positive (beneficial) or negative (adverse). The matrix in **Table 14-12** provides a guide to the assessment but is not a substitute for professional judgement and interpretation, particularly where the sensitivity or effect magnitude levels are not clear or are borderline between categories. **Table 14-13** presents the definitions used by this Chapter for rationalising the significance of an impact.

Table 14-12: Significance of impact matrix

		Magnitude of change			
		High	**Medium**	**Low**	**Negligible**
Value / sensitivity of receptor	**High**	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Minor
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible	Negligible

Table 14-13: Significance of impact definitions

Significance of impact	Definition	
	Beneficial	Adverse
Major	Development will deliver a highly positive contribution and/or better reveal the value of a heritage asset of recognised national or international value, such that an application should be treated very favourably.	Substantial harm or total loss of the value of a designated heritage asset (or asset worthy of designation), such that development should not be consented unless substantial public benefit is delivered by the development.
Moderate	Development will deliver a positive contribution and/or better reveal the value of a designated heritage asset (or asset worthy of designation), such that an application should be treated favourably.	Less than substantial harm or total loss of the value of a designated heritage asset or an asset of designable quality, such that the harm should be weighed against the public benefit delivered by the development to determine consent. Harm to a non-designated heritage asset of a greater degree than that perceived of as minor adverse, which should be considered in determining an application.
Minor	Development will deliver a positive contribution and/or better reveal the value of a non-designated heritage asset.	Less than substantial harm to the value of a designated heritage asset, of a lesser degree than that perceived as moderate adverse but which should still be weighed against the public benefit delivered by the development to determine consent. Harm to a non-designated heritage asset that can be adequately compensated through the implementation of a programme of industry standard mitigation measures.
Negligible	No discernible change to the receptor and its significance.	

14.8.2. Direct Impacts to Marine Archaeology

Direct impacts may occur during all phases of the Proposed Development. A summary of activities which have the potential to introduce pathways for effects to marine archaeology receptors is presented by **Table 14-5** and **Table 14-6**, summarised from **Chapter 3: Project Description.**

This section examines the results of the realistic worst-case scenario at each phase to each receptor discussed in **Section 14.6.1** alongside the embedded mitigation detailed in **Section 14.7**. A summary of the assessment of significance of effect for direct impacts to marine archaeology receptors is presented by **Table 14-14**.

Table 14-14: Summary of assessment conclusions for direct impacts to marine archaeology receptors

Receptor	Sensitivity	Magnitude of Change	Significance of Effect
Sub-seabed deposits of palaeoenvironmental potential	Low to medium	Negligible	Minor
Known archaeological sites and high/medium potential geophysical anomalies	High	Negligible	Minor
Low potential geophysical anomalies	Medium	Low	Minor
Magnetic anomalies	Medium	Low	Minor
Unknown archaeological sites and remains	High	Negligible	Minor

14.8.2.1. Construction impacts to sub-seabed deposits of palaeoenvironmental potential

Units 3, 4C, 5 and 9 have the potential to contain palaeoenvironmental evidence. Construction activities, including pre-construction seabed preparation activities, may result in direct impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

Unit 2D was found, through Stage 1 and 2 geoarchaeological analysis, to represent glaciomarine to marine deposits and warrant no further palaeoenvironmental interest. Similarly, Units 2A and 2B were found to comprise marine sediments of no further interest.

Palaeoenvironmental remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of palaeoenvironmental remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the Proposed Development's worst-case scenario) suggest that the receptor has some capacity to accommodate direct impacts, would be unlikely to experience a significant degree of loss or damage and therefore holds medium sensitivity. The worst-case scenario would result in the loss of palaeoenvironmental evidence of archaeological interest and the loss of all inherent heritage value, however, similar evidence may be widespread throughout the parent unit to survive any impacts (equivalent to a maximum medium magnitude of change).

Archaeological involvement in the planning of future geophysical or geotechnical surveys and archaeological review of acquired data are included as embedded mitigation for the Proposed Development, as laid out in **Section 14.7** and **Table 14-7**. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking further ground truthing activities (boreholes and vibrocores) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and/or international research objectives. The limited impact from further surveys weighed against the potential benefits of the data acquired would result in a negligible magnitude of change.

Greater detail pertaining to the Proposed Development's embedded mitigation is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

The **sensitivity** of sub-seabed deposits of palaeoenvironmental potential has been assessed as **low to medium** and the **magnitude of change** as **negligible**. The **significance** of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved by implementation of embedded mitigation, offsetting the negative magnitude of change experienced during geotechnical investigations by providing the benefit of greater understanding of the receptor.

14.8.2.2. Construction impacts to known archaeological sites and high/medium potential geophysical anomalies

The baseline assessment has identified 24 UKHO and Canmore wreck sites within the Study Area. One (1) high potential geophysical anomaly was identified, likely representing an additional wreck site, along with four (4) medium potential anomalies, possibly representing debris or wreck-related material. Construction activities, including pre-construction seabed preparation activities, may

result in direct impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

Wrecks may be considered of the highest value in terms of cultural significance. Such remains have the potential to possess evidential, intrinsic, contextual and associative value. High and medium potential geophysical anomalies have been identified as having the potential to represent additional wrecks and wreck-related material (such as debris), respectively, and therefore may possess the same value as known wrecks.

The worst-case scenario would see direct and impacts from construction phase activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context (equivalent to a maximum high magnitude of change). Value may also be diminished should activities result in the transportation of archaeological remains from their primary context. This receptor has no capacity to accommodate or recover from such impacts and therefore holds high sensitivity.

The magnitude of change would be reduced by embedded mitigation. The establishment and adherence to AEZs throughout the construction phase would remove the potential for direct impacts to identified archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each known asset, within which no construction activities will take place.

Further embedded mitigation provides for the involvement of a Retained Archaeologist during the planning of future surveys/activities, to ensure that requirements for marine archaeology are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks. New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts and their resultant magnitude of change. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail will be presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

The **sensitivity** of known archaeological sites and high and medium potential geophysical anomalies has been assessed as **high** and the **magnitude of change** as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved by removing the pathway for direct impacts.

14.8.2.3. Construction impacts to low potential geophysical anomalies

The baseline assessment has identified 77 geophysical anomalies of likely anthropogenic origin within the Study Area, though of low potential to be of archaeological interest. Construction activities, including pre-construction seabed preparation activities, may result in direct impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

Geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin but likely to be of limited or no archaeological significance, such as discarded fishing gear, discarded cargo or elements of wreck. The cultural significance of this receptor would be principally determined by its intrinsic and/or associative value. Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value.

As smaller entities with lesser weight than, for example, whole wrecks, archaeological material represented by this receptor would likely be more mobile, compact and robust, having withstood or accommodated background impacts since deposition. As such, they may have the ability to accommodate, in part, impacts arising from proposed construction activities, such as translocation through PLGR or boulder clearance.

The worst-case scenario would see direct and impacts from construction activities result in permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing their intrinsic and/or associative value, which is derived in part from the cohesion of archaeological material (equivalent to a maximum high magnitude of change). Likely comprising material of limited to no archaeological significance, this receptor has limited capacity to accommodate or recover from such impacts and therefore holds medium sensitivity.

Although mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, the magnitude of change would be reduced by other embedded mitigation. Archaeological involvement in further surveys, through a Retained Archaeologist, may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains. Should further investigations or surveys provide additional data relating to one or more geophysical anomalies of low archaeological potential, this may result in reclassification, for example, if a low potential anomaly is found to represent an element of a wreck. In such cases, the anomaly/asset should be reassessed in accordance with its appropriate receptor group and any additional embedded mitigation applied as necessary.

A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological

potential. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

In consideration of the embedded mitigation, direct impacts to geophysical anomalies of low archaeological potential would be reduced, however, some degree of loss cannot be wholly excluded. Through this action, the intrinsic/associative values of this receptor would be largely preserved. The residual change would be of maximum low magnitude.

The **sensitivity** of low potential geophysical anomalies has been assessed as **medium** and the **magnitude of change** as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be largely preserved by implementation of embedded mitigation, reducing the potential for direct impacts to result in a significant effect.

14.8.2.4. Construction impacts to magnetic anomalies

The baseline assessment has identified 681 magnetic anomalies of likely anthropogenic origin within the Study Area. Construction activities, including pre-construction seabed preparation activities, may result in direct impacts to this receptor. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment, however, they may represent wreck, wreck material or other entities of archaeological significance. Magnetic anomalies with a predicted mass of 500 kg or greater are generally considered to be of potential archaeological interest. The criteria and process for determining the archaeological potential of this receptor are detailed within **Appendix 14B: Marine Archaeology Technical Report**. Two hundred and nine (209) magnetic anomalies were identified within the Study Area with an estimated mass of 500 kg or greater and may represent a range of remains, from modern fishing gear to historic wrecks. The baseline assessment concluded that the available data and survey specifications presented a high potential for anomalies of significant mass to lie undetected, however, such remains are considered in **Section 14.8.2.5**, below.

Wrecks may be considered of the highest value, with the potential to possess a combination of intrinsic, contextual and associative values. Non-wreck related magnetic anomalies may hold medium to negligible value, however, this cannot be refined further whilst uncertainty regarding their character and origin remains. The baseline assessment did not identify any magnetic anomalies of sufficient mass to be considered of the highest value, i.e. wreck-related material, therefore, a medium to negligible value is considered most likely for this receptor.

The uncertainty of the nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. In consideration of the likely maximum medium value remains to be represented by this receptor and the worst-case scenario, a maximum medium sensitivity is considered.

The worst-case scenario would see direct impacts from construction activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any intrinsic, contextual or associative value held (equivalent to a maximum high magnitude of change).

Mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, however, the magnitude of effect would be reduced by other embedded mitigation. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO specification surveys typically target magnetic anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to identified archaeological remains, such as the establishment of new AEZs or TAEZs. Should further investigations or surveys provide additional data relating to one or more identified magnetic anomalies, this may result in reclassification, for example, if a magnetic anomaly is found to represent an element of a wreck. In such cases, the anomaly/asset should be reassessed in accordance with its appropriate receptor group and any additional embedded mitigation applied as necessary.

A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

In consideration of the embedded mitigation, direct impacts to magnetic anomalies would be reduced, however, some degree of loss cannot be wholly excluded. Through this action, the intrinsic values of this receptor would be largely preserved. The residual change would be of maximum low magnitude.

The **sensitivity** of magnetic anomalies has been assessed as **medium** and the **magnitude of change** as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be largely preserved by implementation of embedded mitigation, reducing the potential for direct impacts to result in a significant effect.

14.8.2.5. Construction impacts to unknown archaeological sites and remains

The baseline assessment has identified a broad, albeit low, potential for archaeological remains dating from the Late Upper Palaeolithic to post-medieval periods to be present within the Study Area. A greater potential for modern remains has been identified. Such remains may comprise:

- *In situ* prehistoric sites, submerged palaeolandforms, isolated prehistoric artefacts and palaeoenvironmental remains;
- *Ex situ* prehistoric artefacts;
- Wrecks and isolated maritime artefacts; and/or
- Aircraft remains.

Construction activities, including pre-construction seabed preparation activities, may result in direct impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

In situ prehistoric sites, wrecks and aircraft remains may be considered of the highest value, with the potential to possess a combination of intrinsic, contextual and associative values. Other remains may hold one or more of these values, however, as an unknown resource, it is not possible to refine further with the data available. Any remains of these types may also be able to contribute to regional, national and international research frameworks and objectives.

The worst-case scenario would see direct impacts from construction activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any value held (equivalent to a maximum high magnitude of change). In the worst-case scenario, this receptor would have no capacity to accommodate or recover from such impacts and therefore holds high sensitivity.

A maximum high sensitivity alongside a maximum high magnitude of change would result in a major significance of effect. Therefore, further consideration of this receptor is necessary to reduce the significance of effect.

Embedded mitigation has been integrated into the Proposed Development to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

Archaeological involvement in further surveys, through the Retained Archaeologist, may allow greater understanding of this receptor to be developed. UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Archaeological review of future survey data would reduce the likelihood of archaeological sites of the highest sensitivity remaining undetected and thus reduce the likelihood of these experiencing impacts from construction activities. Identification of new sites would then trigger a process through which appropriate embedded mitigation may be implemented, e.g. AEZs. The identification of new sites and any information gained on discovery and subsequent investigation has the potential to improve understanding of the character, extent and condition of any remains and allow suitable mitigation to be implemented beyond the Proposed Development. Long-term awareness and preservation of a newly discovered site would meet the primary objective of policy, legislation and guidance in relation to cultural heritage (i.e. preservation *in situ*) and open the potential for the site to contribute to regional, national and/or international research objectives, as befitting its character and value. Discovery therefore can be considered to have a maximum high beneficial magnitude of effect (i.e. in the instance of a discovery of the highest value).

Where instances of positive and negative change must be compared, industry guidance defers to professional judgement, informed by experience and expertise (English Heritage, 2008). Unknown archaeological remains cannot meaningfully contribute to understanding or appreciation of the historic environment, as potential value is only realised through identification and investigation. As an unknown resource in an unknown location, they are also vulnerable to natural processes and human activities, the latter in the marine environment including seabed development, fishing and recreation.

Unmitigated impacts to unknown remains may result in total loss. Although discovery of new archaeological remains within the RLB may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive) outcome. It is therefore considered that the maximum high negative magnitude of change on discovery would be balanced by a maximum high positive magnitude of change, thereafter, resulting in an overall negligible magnitude.

The **sensitivity** of unknown archaeological sites and remains has been assessed as **high** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved as far as reasonably possible by implementation of embedded mitigation, potentially resulting in a positive magnitude of change.

14.8.2.6. Operation impacts to sub-seabed deposits of palaeoenvironmental potential

Operation activities also have the potential to impact sub-seabed deposits of palaeoenvironmental potential. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

The pathway for direct impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any direct impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for sub-seabed deposits of palaeoenvironmental potential is the same for operation activities as for construction activities. Prior to the application of embedded mitigation, a maximum medium sensitivity alongside a maximum medium magnitude of change would result in a moderate significance of effect.

Following the application of the embedded mitigation measures, the **sensitivity** of sub-seabed deposits of palaeoenvironmental potential has been assessed as **low to medium** and the **magnitude** of change as **negligible**. The **significance** of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.2.1** for details).

14.8.2.7. Operation impacts to known archaeological sites and high/medium potential geophysical anomalies

Activities during the operation phase of the Proposed Development have the potential to result in direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

The pathway for direct impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any direct impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for known archaeological sites and geophysical anomalies of high and medium archaeological potential is the same for operational activities as for construction activities. Prior to the application of embedded mitigation, a maximum high sensitivity alongside a maximum high magnitude of change would result in a major significance of effect.

Following the application of the embedded mitigation measures, the **sensitivity** of known archaeological sites and high and medium potential geophysical anomalies has been assessed as **high** and the **magnitude** of change as **negligible**. The **significance** of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.2.2** for details).

14.8.2.8. Operation impacts to low potential geophysical anomalies

Operation activities also have the potential to impact geophysical anomalies of low archaeological potential. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5.**

The pathway for direct impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any direct impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for geophysical anomalies of low archaeological potential is the same for operation activities as for construction activities. Prior to the application of embedded mitigation, a maximum medium sensitivity alongside a maximum high magnitude of impact would result in a major significance of effect.

Following the application of the embedded mitigation measures, the **sensitivity** of low potential geophysical anomalies has been assessed as **medium** and the **magnitude** of change as **low**. The **significance** of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.2.3** for details).

14.8.2.9. Operation impacts to magnetic anomalies

Operation activities also have the potential to impact magnetic anomalies. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5**.

The pathway for direct impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any direct impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for magnetic anomalies is the same for operation activities as for construction activities. Prior to the application of embedded mitigation, a maximum medium sensitivity alongside a maximum high magnitude of impact would result in a major significance of effect.

Following the application of the embedded mitigation measures, the **sensitivity** of magnetic anomalies has been assessed as **medium** and the **magnitude** of change as **low**. The **significance** of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.2.4** for details).

14.8.2.10. Operation impacts to unknown archaeological sites and remains

Operation activities also have the potential to impact unknown archaeological sites and remains. The pathways for impacts are presented by **Table 14-4.**

The pathway for direct impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any direct impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for unknown archaeological sites and remains is the same for operation activities as for construction activities. Prior to the application of embedded mitigation, a maximum high sensitivity alongside a maximum high magnitude of impact would result in a major significance of effect.

Following the application of the embedded mitigation measures, the **sensitivity** of unknown archaeological sites and remains has been assessed as **high** and the **magnitude** of change as **negligible**. The **significance** of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.2.5** for details).

14.8.2.11. Decommissioning impacts

The expected minimum operational life of the proposed landfall infrastructure is 40 years, with replacement only expected to occur upon the failing of specific assets.

The below ground transition joint bay providing onshore to offshore cable interface may be left in place as well as the ducts installed to bring the cables onshore. As a result, it is expected that there would be similar methods to remove these components as those used to install the asset.

The minimum design life of the Proposed Development's subsea cables is 40 years, although with repairs, some cable systems last upwards of 60 years. The Proposed Development will require a Licence or Lease from Crown Estate Scotland. An Initial Decommissioning Plan (IDP) will be written once the final route and construction methodology is chosen and it may be a condition of the Marine Licence for the Proposed Development (if granted) that the IDP should be approved by MD-LOT (and potentially other consultees) before construction can commence. This is a legal requirement necessary to secure the Crown Estate Scotland Lease or Licence. The IDP will form the basis of the Final Decommissioning Plan which would be developed in consultation with Crown Estate Scotland and in line with the following decommissioning principles:

- The measures and methods for any decommissioning would comply with any legal obligations which would apply to the decommissioning of the Proposed Development when it takes place;
- All sections of the cables within 12 NM would be removed, except for any section or sections which are preferable to leave *in situ* having regard to the principles below:
    - That the measures and methods for any decommissioning are the best for, or minimise the risks to:

- The safety of surface or subsurface navigation;
- Other uses of the sea;
- The marine environment including living resources; and/or;
- Health and safety; and

- The seabed would be restored, as reasonably as possible and to the extent reasonably practicable, to the condition that it was in before the cable was installed.

The IDP is periodically reviewed and updated in line with the applicable guidance and regulations at the time of writing.

The full environmental impact of works required to decommission the Proposed Development would be assessed at the time of decommissioning and a separate Marine Licence would be applied for in relating to any decommissioning works proposed. Removal of the subsea cable is a similar process to the installation of the cable, but in reverse. The environmental impact can therefore not be fully assessed until the environmental conditions at the time of decommissioning are established.

14.8.3. Indirect Impacts to Marine Archaeology

Indirect impacts may occur during all phases of the Proposed Development. A summary of activities which have the potential to introduce pathways for effects to marine archaeology receptors is presented by **Table 14-4** and **Table 14-6**, summarised from **Chapter 3: Project Description** and **Chapter 6: Marine Physical Processes.**

This section examines the results of the realistic worst-case scenario at each phase to each receptor discussed in **Section 14.6.1** alongside the embedded mitigation detailed in **Section 14.7**. A summary of the assessment of significance of effect for indirect impacts to marine archaeology receptors is presented by **Table 14-15**.

Table 14-15: Summary of assessment conclusions for indirect impacts to marine archaeology receptors

Receptor	Sensitivity	Magnitude of Change	Significance of Effect
Sub-seabed deposits of palaeoenvironmental potential	Low to medium	Negligible	Minor
Known archaeological sites and high/medium potential geophysical anomalies	High	Negligible	Minor
Low potential geophysical anomalies	Medium	Low	Minor
Magnetic anomalies	Medium	Low	Minor
Unknown archaeological sites and remains	High	Negligible	Minor

14.8.3.1. Construction impacts to sub-seabed deposits of palaeoenvironmental potential

Units 3, 4B, 5 and 9 have the potential to contain palaeoenvironmental evidence. Construction activities, including pre-construction seabed preparation activities, may result in indirect impacts to such evidence. The pathways for indirect impacts and worst-case scenario can be summarised as:

- Sediment removal, resulting in exposure of the receptor to hydrodynamic processes; and
- Scouring around vessel anchors and cable protection.

Further detail is presented by **Table 14-4** and **Table 14-6.**

Unit 2D was found, through Stage 1 and 2 geoarchaeological analysis, to represent glaciomarine deposits and warrant no further palaeoenvironmental interest. Similarly, Units 2A and 2B were found to comprise marine sediments of no further interest.

Palaeoenvironmental remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of palaeoenvironmental remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the Proposed Development's worst-case scenario) suggest that the receptor has some capacity to accommodate indirect impacts, would be unlikely to experience a significant degree of loss or damage and therefore holds medium sensitivity. The worst-case scenario would result in the loss of palaeoenvironmental evidence of archaeological interest and the loss of all inherent heritage value (equivalent to a maximum high magnitude of change).

Archaeological involvement in the planning of future geophysical or geotechnical surveys and archaeological review of acquired data are included as embedded mitigation of the Proposed Development, as laid out in **Section 14.7** and **Table 14-7.** Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking further ground truthing activities (boreholes and vibrocores) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and/or international research objectives. The limited impact from further surveys weighed against the potential benefits of the data acquired would result in a negligible magnitude of change.

Greater detail pertaining to the Proposed Development's embedded mitigation is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

The **sensitivity** of sub-seabed deposits of palaeoenvironmental potential has been assessed as **low to medium** and the **magnitude** of change as **negligible**. The **significance** of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved by implementation of embedded mitigation, offsetting the negative magnitude of change experienced during geotechnical investigations by providing the benefit of greater understanding of the receptor.

14.8.3.2. Construction impacts to known archaeological sites and high/medium potential geophysical anomalies

The baseline assessment has identified 24 UKHO and Canmore wreck sites within the Study Area. One (1) high potential geophysical anomaly was identified, likely representing an additional wreck site, along with four (4) medium potential anomalies, possibly representing debris or wreck-related material. Construction activities, including pre-construction seabed preparation activities, may result in indirect impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6** and can be summarised as:

- Redeposition of suspended sediment, resulting in compression of remains and/or enhanced protection against project-related and natural processes;
- Sediment removal, resulting in destabilisation of remains and/or exposure of the receptor to hydrodynamic processes; and
- Scouring around vessel anchors and cable protection.

Redeposition of sediment released from the seabed during construction activities will have the greatest impact within 10 m of the location of sediment release (see **Table 14-4**). The greatest quantity and size of sediment grains will settle within this area, illustrating a greater potential for indirect impacts to archaeological remains. The sediment plume beyond this area will be dispersed by peak flow speeds, grain size and causal activity. Redeposition of suspended sediment may result in adverse effects, through the compression of remains and subsequent damage, or beneficial effects, where the redeposited sediment affords enhanced protection against natural processes or other project-related impacts, such as scouring.

Removal of sediment, such as during sandwave clearance, may destabilise archaeological remains which were previously supported by those sediments. Destabilisation may increase the potential for affected remains to experience damage, for example, exposed wreck timbers breaking under their own weight. Removal of adjacent sediments may also expose remains to subsequent hydrodynamic processes, increasing the potential for future impacts.

Indirect impacts resulting from scouring may arise where the installation of cable protection and positioning of vessel anchors presents changes to local marine physical processes. These processes can result in damage to and loss of this receptor.

Wrecks may be considered of the highest value in terms of cultural significance. Such remains have the potential to possess evidential, intrinsic, contextual and associative value. High and medium potential geophysical anomalies have been identified as having the potential to represent additional wrecks and wreck-related material (such as debris), respectively, and therefore may possess the same value as known wrecks.

The worst-case scenario would see indirect impacts from construction phase activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context (equivalent to a maximum high magnitude of change). Value may also be diminished should activities result in the transportation of archaeological remains from their primary context. This receptor has no capacity to accommodate or recover from such impacts and therefore holds high sensitivity.

The magnitude of change would be reduced by embedded mitigation. The establishment and adherence to AEZs throughout the construction phase would remove the potential for indirect impacts to identified archaeological sites and geophysical anomalies of high and medium archaeological potential or reduce these to such a level as to result in no greater impact than that of natural, background effects. A bespoke and appropriately sized buffer will be implemented for each known asset, within which no construction activities will take place and where the ZoI of activities will be considered.

Further embedded mitigation provides for the involvement of a Retained Archaeologist during the planning of future surveys/activities, to ensure that requirements for marine archaeology are upheld and specifications can consider the collection of additional data to

improve understanding of identified anomalies and wrecks. New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts and their resultant magnitude of change. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

The **sensitivity** of known archaeological sites and high and medium potential geophysical anomalies has been assessed as **high** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved by removing the pathway for indirect impacts or reducing the potential for impacts resulting in a greater significance of effect.

14.8.3.3. Construction impacts to low potential geophysical anomalies

The baseline assessment has identified 77 geophysical anomalies of likely anthropogenic origin within the Study Area, though of low potential to be of archaeological interest. Construction activities, including pre-construction seabed preparation activities, may result in indirect impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5** and can be summarised as:

- Redeposition of suspended sediment, resulting in compression of remains and/or enhanced protection against project-related and natural processes;
- Sediment removal, resulting in destabilisation of remains and/or exposure of the receptor to hydrodynamic processes; and
- Scouring around vessel anchors and cable protection.

Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

Geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin but likely to be of limited or no archaeological significance, such as discarded fishing gear, discarded cargo or elements of wreck. The cultural significance of this receptor would be principally determined by its intrinsic and/or associative value. Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value.

As smaller entities with lesser weight than, for example, whole wrecks, archaeological material represented by this receptor would likely be more mobile, compact and robust, having withstood or accommodated background impacts since deposition. As such, they may have the ability to accommodate, in part, indirect impacts arising from proposed construction activities, such as destabilisation or compression.

The worst-case scenario would see indirect impacts from construction activities result in permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing their intrinsic and/or associative value, which is derived in part from the cohesion of archaeological material (equivalent to a maximum high magnitude of change). Likely comprising material of limited to no archaeological significance, this receptor has limited capacity to accommodate or recover from such impacts and therefore holds medium sensitivity.

Although mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, the magnitude of change would be reduced by other embedded mitigation. Archaeological involvement in further surveys, through a Retained Archaeologist, may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains.

A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

In consideration of the embedded mitigation, indirect impacts to geophysical anomalies of low archaeological potential would be reduced, however, some degree of loss cannot be wholly excluded. Through this action, the intrinsic/associative values of this receptor would be largely preserved. The residual change would be of maximum low magnitude.

The **sensitivity** of low potential geophysical anomalies has been assessed as **medium** and the **magnitude of change** as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be largely preserved by implementation of embedded mitigation, reducing the potential for indirect impacts to result in a significant effect.

Should further investigations or surveys provide additional data relating to one or more geophysical anomalies of low archaeological potential, this may result in reclassification, for example, if a low potential anomaly is found to represent an element of a wreck. In such cases, the anomaly/asset should be reassessed in accordance with its appropriate receptor group and any additional embedded mitigation applied as necessary.

14.8.3.4. Construction impacts to magnetic anomalies

The baseline assessment has identified 681 magnetic anomalies of likely anthropogenic origin within the Study Area. Construction activities, including pre-construction seabed preparation activities, may result in indirect impacts to this receptor. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5** and can be summarised as:

- Redeposition of suspended sediment, resulting in compression of remains and/or enhanced protection against project-related and natural processes;
- Sediment removal, resulting in destabilisation of remains and/or exposure of the receptor to hydrodynamic processes; and
- Scouring around vessel anchors and cable protection.

Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment, however, they may represent wreck, wreck material or other entities of archaeological significance. Magnetic anomalies with a predicted mass of 500 kg or greater are generally considered to be of archaeological interest. The criteria and process for determining the archaeological potential of this receptor are detailed within **Appendix 14A: Marine Archaeology Technical Report**. Two hundred and nine (209) magnetic anomalies were identified within the Study Area with an estimated mass of 500 kg or greater and may represent a range of remains, from modern fishing gear to historic wrecks. The baseline assessment concluded that the available data and survey specifications presented a high potential for anomalies of significant mass to lie undetected, however, such remains are considered in **Section 14.8.3.5**, below.

Wrecks may be considered of the highest value, with the potential to possess a combination of intrinsic, contextual and associative values. Non-wreck related magnetic anomalies may hold medium to negligible value, however, this cannot be refined further whilst uncertainty regarding their character and origin remains. The baseline assessment did not identify any magnetic anomalies of sufficient mass to be considered of the highest value, i.e. wreck-related material, therefore, a medium to negligible value is considered most likely for this receptor.

The uncertainty of the nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. In consideration of the likely maximum medium value remains to be represented by this receptor and the worst-case scenario, a maximum medium sensitivity is considered.

The worst-case scenario would see indirect impacts from construction activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any intrinsic, contextual or associative value held (equivalent to a maximum high magnitude of change).

Mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, however, the magnitude of effect would be reduced by other embedded mitigation. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO specification surveys typically target magnetic anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to identified archaeological remains, such as the establishment of new AEZs or TAEZs.

A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

In consideration of the embedded mitigation, indirect impacts to magnetic anomalies would be reduced, however, some degree of loss cannot be wholly excluded. Through this action, the intrinsic values of this receptor would be largely preserved. The residual change would be of maximum low magnitude.

The **sensitivity** of magnetic anomalies has been assessed as **medium** and the **magnitude** of change as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be largely preserved by implementation of embedded mitigation, reducing the potential for indirect impacts to result in a significant effect.

Should further investigations or surveys provide additional data relating to one or more identified magnetic anomalies, this may result in reclassification, for example, if a magnetic anomaly is found to represent an element of a wreck. In such cases, the anomaly/asset should be reassessed in accordance with its appropriate receptor group and any additional embedded mitigation applied as necessary.

14.8.3.5. Construction impacts to unknown archaeological sites and remains

The baseline assessment has identified a broad, albeit low, potential for archaeological remains dating from the Late Upper Palaeolithic to post-medieval periods to be present within the Study Area. A greater potential for modern remains has been identified. Such remains may comprise:

- *In situ* prehistoric sites, submerged palaeolandforms, isolated prehistoric artefacts and palaeoenvironmental remains;

- *Ex situ* prehistoric artefacts;
- Wrecks and isolated maritime artefacts; and/or
- Aircraft remains.

Construction activities, including pre-construction seabed preparation activities, may result in indirect impacts to such evidence. The pathways for impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-5** and can be summarised as:

- Redeposition of suspended sediment, resulting in compression of remains and/or enhanced protection against project-related and natural processes;
- Sediment removal, resulting in destabilisation of remains and/or exposure of the receptor to hydrodynamic processes; and
- Scouring around vessel anchors and cable protection.

Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

In situ prehistoric sites, wrecks and aircraft remains may be considered of the highest value, with the potential to possess a combination of intrinsic, contextual and associative values. Other remains may hold one or more of these values, however, as an unknown resource, it is not possible to refine further with the data available. Any remains of these types may also be able to contribute to regional, national and international research frameworks and objectives.

The worst-case scenario would see indirect impacts from construction activities result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any value held (equivalent to a maximum high magnitude of change). In the worst-case scenario, this receptor would have no capacity to accommodate or recover from such impacts and therefore holds high sensitivity.

Embedded mitigation has been integrated into the Proposed Development to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains.

Archaeological involvement in further surveys, through the Retained Archaeologist, may allow greater understanding of this receptor to be developed. UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. All embedded mitigation and methods for implementation and adherence are laid out in **Section 14.7** and **Table 14-7**. Greater detail is presented in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**.

In consideration of the embedded mitigation, the magnitude of indirect impacts to unknown archaeological remains would be reduced, however, some degree of damage/loss cannot be wholly excluded. The process of discovery itself is likely to result in some degree of impact which may equate to the worst-case scenario. Any impact may be of maximum high magnitude.

Correlation of high receptor sensitivity alongside high magnitude of change produces a major significance of effect, which is considered significant in EIA terms. Therefore, further consideration of this receptor is necessary to reduce the significance of effect.

Archaeological review of future survey data (as an embedded mitigation measure) would reduce the likelihood of archaeological sites of the highest sensitivity remaining undetected and thus reduce the likelihood of these experiencing impacts from construction activities. Identification of new sites would then trigger a process through which appropriate embedded mitigation may be implemented, e.g. AEZs. The identification of new sites and any information gained on discovery and subsequent investigation has the potential to improve understanding of the character, extent and condition of any remains and allow suitable mitigation to be implemented beyond the Proposed Development. Long-term awareness and preservation of a newly discovered site would meet the primary objective of policy, legislation and guidance in relation to cultural heritage (i.e. preservation *in situ*) and open the potential for the site to contribute to regional, national and/or international research objectives, as befitting its character and value. Discovery therefore can be considered to have a maximum high beneficial magnitude of effect (i.e. in the instance of a discovery of the highest value).

Where instances of positive and negative change must be compared, industry guidance defers to professional judgement, informed by experience and expertise (Historic England, 2010). Unknown archaeological remains cannot meaningfully contribute to understanding or appreciation of the historic environment, as potential value is only realised through identification and investigation. As an unknown resource in an unknown location, they are also vulnerable to natural processes and human activities, the latter in the marine environment including seabed development, fishing and recreation.

Unmitigated impacts to unknown remains may result in total loss. Although discovery of new archaeological remains within the Proposed Development may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive)

outcome. It is therefore considered that the maximum high negative magnitude of change on discovery would be balanced by a maximum high positive magnitude of change, thereafter, resulting in an overall negligible magnitude.

The **sensitivity** of unknown archaeological sites and remains has been assessed as **high** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant**. The value of this receptor would be preserved as far as reasonably possible by implementation of embedded mitigation, potentially resulting in a positive magnitude of change.

New archaeological discoveries should be assessed for impacts in accordance with their appropriate receptor group and any additional embedded mitigation applied as necessary.

14.8.3.6. Operation impacts to sub-seabed deposits of palaeoenvironmental potential

Operation activities also have the potential to impact sub-seabed deposits of palaeoenvironmental potential. The pathways for indirect impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6.**

The pathway for indirect impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable), resulting in suspended sediments, and the laying back of cables upon the seabed, possibly resulting in scouring. The potential for impacts through this pathway would be applicable throughout the Proposed Development.

The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for sub-seabed deposits of palaeoenvironmental potential is the same for operation activities as for construction activities. The **sensitivity** of sub-seabed deposits of palaeoenvironmental potential has been assessed as **medium** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.3.1** for details).

14.8.3.7. Operation impacts to known archaeological sites and high/medium potential geophysical anomalies

Activities during the operation phase of the Proposed Development have the potential to result in indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential. The pathways for indirect impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6**.

The pathway for indirect impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable), resulting in suspended sediments, and the laying back of cables upon the seabed, possibly resulting in scouring. The potential for impacts through this pathway would be applicable throughout the Proposed Development. Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for known archaeological sites and geophysical anomalies of high and medium archaeological potential is the same for operational activities as for construction activities. The **sensitivity** of known archaeological sites and high and medium potential geophysical anomalies has been assessed as **high** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.3.2** for details).

14.8.3.8. Operation impacts to low potential geophysical anomalies

Operation activities also have the potential to impact geophysical anomalies of low archaeological potential. The pathways for indirect impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6**.

The pathway for indirect impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable), resulting in suspended sediments, and the laying back of cables upon the seabed, possibly resulting in scouring. The potential for impacts through this pathway would be applicable throughout the Proposed Development. Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for geophysical anomalies of low archaeological potential is the same for operation activities as for construction activities. The **sensitivity** of low potential geophysical anomalies has been assessed as **medium** and the **magnitude** of change as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.3.3** for details).

14.8.3.9. Operation impacts to magnetic anomalies

Operation activities also have the potential to impact magnetic anomalies. The pathways for indirect impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6**.

The pathway for indirect impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable), resulting in suspended sediments, and the laying back of cables upon the seabed, possibly resulting in scouring. The potential for impacts through this pathway would be applicable throughout the Proposed Development. Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for magnetic anomalies is the same for operation activities as for construction activities. The **sensitivity** of magnetic anomalies has been assessed as **medium** and the **magnitude** of change as **low**. The significance of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.3.4** for details).

14.8.3.10. Operation impacts to unknown archaeological sites

Operation activities also have the potential to impact unknown archaeological sites and remains. The pathways for indirect impacts and worst-case scenario are presented by **Table 14-4** and **Table 14-6**.

The pathway for indirect impacts during cable replacement/repair would comprise equipment used for cable de-burial (if applicable), resulting in suspended sediments, and the laying back of cables upon the seabed, possibly resulting in scouring. The potential for impacts through this pathway would be applicable throughout the Proposed Development. Further detail regarding pathways for indirect impacts is presented in **Section 14.8.3.2**.

The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the Proposed Development.

The impact assessment for unknown archaeological sites and remains is the same for operation activities as for construction activities. The **sensitivity** of unknown archaeological sites and remains has been assessed as **high** and the **magnitude** of change as **negligible**. The significance of the effect has been assessed as **Minor** and **Not Significant** (see **Section 14.8.3.5** for details).

14.8.3.11. Decommissioning impacts

The Proposed Development's decommissioning principles are outlined in **Section 14.8.2.11**. The full environmental impact of works required to decommission the Proposed Development would be assessed at the time of decommissioning. Removal of the subsea cable is a similar process to the construction of the cable, but in reverse. The environmental impact can therefore not be fully assessed until the environmental conditions at the time of decommissioning are established.

14.9. Project Specific Mitigation

Impacts to both known and potential marine archaeological receptors would be addressed through the application of embedded mitigation. In line with current policy and guidance, mitigation aims first to avoid adverse impacts on historic assets, minimise impacts where they cannot be avoided or mitigate impacts where they cannot be minimised.

Known receptors (identified through the assessment) would be avoided through the application of Archaeological Exclusion Zones (AEZs), Temporary Archaeological Exclusion Zones (TAEZs) and subsequent micro-siting of infrastructure on the seabed, as necessary.

Unavoidable impacts to potential receptors would be addressed through a series of agreed mitigation measures to manage discoveries once identified. These measures are set out in **Appendix 14B: Written Scheme of Investigation and Protocol for Archaeological Discoveries**, as part of the MEAp, which will clarify the methodologies to address unavoidable impacts associated with the worst-case scenario (the Rochdale Envelope Approach), in accordance with the model clauses from *Archaeological Written Schemes of Investigation: Offshore Wind Farm Projects* (The Crown Estate, 2021). Though produced for offshore wind development, the principles of the model clauses are applicable more broadly to offshore development under UK planning policy and legislation.

14.10. Residual Effect

The impact assessment has concluded that, after the application of embedded mitigation measures, the resultant significance of effect to any marine archaeology receptor will be no greater than **minor adverse** (**Not Significant** in EIA terms). A summary of the impact assessment is presented by **Table 14-16**.

The impact assessment criteria (receptor, sensitivity and magnitude of change) are the same for construction and operation phases, as are the residual levels of significance of effect.

Table 14-16: Summary of Impact Assessment for Marine Archaeology

Potential effect	Receptor	Sensitivity	Magnitude of change	Significance of effect
Direct impacts to marine archaeology assets, resulting in damage and/or loss	Sub-seabed deposits of palaeoenvironmental potential	Medium	Negligible	Minor
	Known archaeological sites and high/medium potential geophysical anomalies	High	Negligible	Minor
	Low potential geophysical anomalies	Medium	Low	Minor
	Magnetic anomalies	Medium	Low	Minor
	Unknown archaeological sites	High	Negligible	Minor
Indirect impacts to marine archaeology assets, resulting in damage, loss, relocation and/or destabilisation	Sub-seabed deposits of palaeoenvironmental potential	Medium	Negligible	Minor
	Known archaeological sites and high/medium potential geophysical anomalies	High	Negligible	Minor
	Low potential geophysical anomalies	Medium	Low	Minor
	Magnetic anomalies	Medium	Low	Minor
	Unknown archaeological sites	High	Negligible	Minor

14.11. Cumulative Effects

If the construction or decommissioning of other plans and projects have a spatial or temporal overlap with the construction of the Proposed Development and its impacts, there is potential for cumulative adverse effects on marine archaeology greater than that caused solely by the Proposed Development. As outlined by **Chapter 4: Marine Environmental Appraisal Scope and Methodology**, a four-stage approach has been undertaken to assess the cumulative adverse effects from other plans and projects in-combination with the construction of the Proposed Development.

14.11.1. Stage 1: Identification of Zone of Influence

Chapter 6: Marine Physical Processes concluded that the furthest distance that suspended sediment will be deposited from the Proposed Development is 13.6 km, dependent on peak flow speed. All sedimentation outside the RLB will be from fine particulates that will settle in 1 mm (at 6.5 km from the plume source) or less thicknesses, which is indistinguishable from background levels. At maximum peak flow speed (1.05 m/s), very fine- to medium-grained sands (125 to 500 µm) would settle within 500 m of the sediment release location. Only fines (<63 µm) would settle beyond this, up to 13.6 km from the source of activity. The size of sediment grains and volume of the plume will decrease with distance from the sediment release location.

Chapter 6: Marine Physical Processes also estimated the rate of fine sediment release associated with specific activities. The maximum distance where suspended sediment concentration would exceed 5 mg/l was estimated at 4.6 km, from sandwave clearance. Additionally, Sinclair *et al*. (2023) report that 90% of sediments suspended during cable laying activities are predicted to resettle within 1 km of cable-laying activities and Gooding *et al*. (2012) suggest that fine particles may travel 1 to 2 km from the source.

Therefore, the ZoI for the cumulative effects assessment for marine archaeology is 2 km. Any sedimentation outside of this 2 km ZoI as a result of the Proposed Development will not cause adverse effects on marine archaeology receptors above background levels. All plans and projects within the ZoI are assessed in-combination with the Proposed Development to determine if there will be any significant cumulative adverse effects to marine archaeology.

14.11.2. Stage 2: Shortlist of Plans and Projects Relevant to Marine Archaeology

Chapter 4: Marine Environmental Appraisal Scope and Methodology outlines a longlist of six plans and projects within 30 km of the Proposed Development. From this longlist, six plans/projects within 2 km of the Proposed Development have been shortlisted to inform the cumulative effects assessment for marine archaeology (**Table 14-17**). Infrastructure within this ZoI that is already

operational has been scoped out, since the effects of the maintenance of operational projects have influenced the baseline assessment.

Table 14-17: Shortlist of projects

Application Reference	Plan or Project	Type of Project	Distance from Proposed Development	Status
00010344	Morven Offshore Wind Farm (OWF)	OWF	1.98 km	Pre Application - Scoping Report
06771 & 06870	NorthConnect	Cable	0 km/crosses	Licence expired
00009943	Eastern Green Link 2 (EGL 2)	Cable	0 km/crosses	Licence granted
00011091	Cenos Floating OWF	Export cable	0 km/crosses	Application – EIA Submitted
SCOP-0066	Aspen Floating OWF	Export cable	0 km/crosses	Pre Application – Scoping Report
SCOP-0020	MarramWind OWF	Export cable	0 km/crosses	Pre Application – Scoping Report

14.11.3. Stage 3: Information Gathering and Identification of Pressure-Receptor Pathways

Construction of the Proposed Development is scheduled to commence in 2028, with the latest possible completion by 2033. Within this window, construction (including pre-lay activity) is expected to take 55 months.

Morven OWF is situated *c.* 1.98 km from the Proposed Development and is due to commence construction in 2027, with commercial operation scheduled to begin in 2030. Thus, there will be a direct temporal overlap in construction between the two projects. As Morven OWF is situated outside of the RLB of the Proposed Development, simultaneous construction or sequential construction in quick succession of the two projects has the potential for cumulative adverse effects from temporary increase and deposition of suspended sediments from associated construction activities. Cumulative direct impacts may also occur to deposits of palaeoenvironmental potential, considering the widespread regional distribution of this receptor.

The Marine Licence Application (MLA) for Eastern Green Link (EGL) 2 has been granted and construction is currently underway, with cable operation scheduled for 2029. EGL 2 and the Proposed Development share a common landfall at Sandford Bay, Peterhead, therefore, it is expected that there will be a temporal overlap in construction with the Proposed Development for one year. EGL 2 overlaps the RLB of the Proposed Development at Sandford Bay landfall and Peterhead nearshore, thus, there is potential for cumulative adverse effects from:

- Direct impacts; and
- Indirect impacts, arising from:
    - Redeposition of suspended sediment;
    - Sediment removal; and/or
    - Scouring.

NorthConnect is planned to cross the Proposed Development at approximately KP 576. However, construction of NorthConnect has been placed on hold by the Norwegian Government and the current Marine Licence for this project has expired (expiration date 2024). As no new MLA has been submitted or Marine Licence granted for the project, it is assumed that this project will not have a temporal overlap in construction with the Proposed Development. Therefore, NorthConnect will not be assessed in combination with the Proposed Development and will not be taken forward to Stage 4 of the cumulative effects assessment.

Cenos Floating OWF's export cable corridor crosses the Proposed Development at KP 576, utilising the DC routing of NorthConnect within 12 NM to reduce the need for additional infrastructure (Scottish Government, 2025a). Cenos Floating OWF is currently in its permitting phase, having submitted EIA in January 2025 (application reference number: 00011091) (Scottish Government, 2025a) and is scheduled to commence construction from 2030, with operation in 2031. As such, there may be a direct temporal overlap in construction between the two projects. As outlined in **Chapter 3: Project Description**, a worst-case scenario has been assumed that, where the developments cross, Cenos Floating OWF export cables will be constructed prior to the Proposed Development and the

area of external cable protection required by the Proposed Development for this cable crossing is included in the worst-case scenario for marine archaeology outlined in **Table 14-5**. As Cenos Floating OWF's export cable corridor overlaps the RLB of the Proposed Development, there is potential for cumulative adverse effects from direct and indirect impacts to marine archaeology.

Aspen Floating OWF is currently in pre-application, having submitted the Scoping Report in May 2025 (application reference number: SCOP-0066) (Scottish Government, 2025b) and is scheduled to begin construction in 2028 with operation commencing in 2029/2030. As such, there may be a direct temporal overlap in construction between the two projects. The export cable corridor scoping boundary of Aspen Floating OWF overlaps with the Proposed Development and, due to the uncertainty of overlap in construction timelines, it is unclear as to which project will carry out cable installation first. Due to the application stage of Aspen Floating OWF, there is no EIA available for this project and its project-specific impacts to marine archaeology receptors are unknown. Therefore, Aspen Floating OWF cannot be assessed in combination with the Proposed Development and will not be taken forward to Stage 4 of the cumulative effects assessment. However, as outlined in **Chapter 3: Project Description**, a worst-case scenario has been assumed that, where the developments cross, Aspen Floating OWF will be constructed prior to the Proposed Development and the area of external cable protection required by the Proposed Development for this cable crossing is included in the worst-case scenario for impacts to marine archaeology outlined in Table 14-5.

MarramWind OWF is currently in pre-application, having submitted the Scoping Report in January 2023 (application reference number: SCOP-0020) (Scottish Government, 2023). Construction is scheduled to begin in the late 2020s, following planning decisions in 2026 and is scheduled to be operational in the 2030s. Therefore, there may be a direct temporal overlap in construction between the two projects. The scoping boundary of MarramWind OWF overlaps with the RLB of the Proposed Development at Peterhead nearshore. However, due to the application stage of MarramWind OWF, there is no EIA available for this project and its project-specific impacts to marine archaeology receptors are unknown. Therefore, MarramWind OWF cannot be assessed in combination with the Proposed Development and will not be taken forward to Stage 4 of the cumulative effects assessment. However, as outlined in **Chapter 3: Project Description**, a worst-case scenario has been assumed that, where the developments cross, MarramWind OWF will be constructed prior to the Proposed Development and the area of external cable protection required by the Proposed Development for this cable crossing is included in the worst-case scenario for impacts to marine archaeology outlined in Table 14-5.

In consideration of the Proposed Development's decommissioning principles (see **Section 14.8.2.11**), an impact assessment for this phase cannot be completed at this stage and has not featured in this chapter. The projects in the shortlist for the cumulative effects assessment (Table 14-17) have each adopted a similar approach. As such, the cumulative effects assessment for decommissioning impacts shall be undertaken as part of each respective project's Marine License application for decommissioning works.

14.11.4. Stage 4: Assessment

14.11.4.1. Direct impacts to marine archaeology – EGL 2

EGL 2 overlaps with the Proposed Development at the Sandford Bay landfall and within the Peterhead nearshore zone (KP 580 to 579 and KP 575). Both projects involve activities directly affecting the seabed, with the potential to result in cumulative effects to marine archaeology receptors. Each project cable will run adjacent to one another, not overlap, requiring project-specific route preparation and each will be buried within its own trench. As outlined in Chapter 3: Project Description of the EGL 2 Environmental Appraisal Report (AECOM, 2022a), the maximum width of seabed disturbance from cable trenching is approximately 25 m. Thus, it is assumed the worst-case cumulative effect of seabed disturbance will be approximately double that from the Proposed Development.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.2.1 and **Section 14.8.2.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) identifies 33 features of palaeogeographic interest in Scottish waters. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of direct impacts to sub-seabed deposits of palaeoenvironmental potential is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.2.2 and **Section 14.8.2.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) identified 25 locations of known or likely archaeological sites in Scottish waters, including wreck sites, debris fields and magnetic anomalies (15 within 12 NM and 10

beyond). Embedded mitigation implements the use of AEZs, removing the pathway for direct impacts to this receptor. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of direct impacts to known archaeological sites and high/medium potential geophysical anomalies is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.2.3, 14.8.2.4, 14.8.2.8 and **14.8.2.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from direct impacts during the construction and operation phases of the Proposed Development.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified 467 features equivalent to low potential geophysical or magnetic anomalies (311 within 12 NM and 156 beyond, in Scottish waters). Magnetic anomalies of high archaeological potential were included within the 25 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of direct impacts to low potential geophysical and magnetic anomalies is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.2.5 and **Section 14.8.2.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified the potential for additional palaeogeographic features and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of direct impacts to unknown archaeological sites and remains is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.2. Indirect impacts (redeposition of suspended sediment) to marine archaeology – EGL 2

Indirect impact pathways for EGL 2 in relation to marine archaeology are similar to the Proposed Development. **Chapter 6: Marine Physical Processes** indicates a maximum distance of 13.6 km from the release location for sediment redeposition, however, the maximum distance of measurable change (from background changes) in suspended sediment would be 4.6 km. This presents a potential overlap between the two projects and the potential for cumulative effects to marine archaeology through indirect impacts associated with the redeposition of suspended sediment.

Sub-seabed deposits of palaeoenvironmental potential have not been identified as susceptible to indirect impacts arising from suspended sediment deposition and are, therefore, not assessed further here.

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) has identified 25 locations of known or likely archaeological sites in Scottish waters, including wreck sites, debris fields and magnetic anomalies (15 within 12 NM and 10 beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of the greatest sediment deposition with the potential for indirect impacts. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified 467 features equivalent to low potential geophysical or magnetic anomalies (311 within 12 NM and 156 beyond, in Scottish waters). Magnetic anomalies of high archaeological potential were included within the 25 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified the potential for additional palaeogeographic features and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.3. Indirect impacts (sediment removal) to marine archaeology – EGL 2

Indirect impact pathways for EGL 2 in relation to marine archaeology are similar to the Proposed Development. Sediments potentially protecting and/or stabilising marine archaeology will be removed during construction and possibly also operation and decommissioning activities, initiating a pathway for potential indirect impacts through increased exposure and destabilisation. **Chapter 6: Marine Physical Processes** indicates that a high concentration of the sediment released during activities will be redeposited within 10 m of the release location, settling shortly after the causal event. The potential for marine archaeology to be left exposed and/or destabilised for long periods of time would, therefore, be limited.

In consideration of the limited ZoI for indirect impacts arising from sediment removal, cumulative effects are likely to occur where activities of the Proposed Development overlap with those of EGL 2.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.3.1 and **Section 14.8.3.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from sediment removal associated with the Proposed Development (construction and operation phases, respectively).

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) has identified 33 features of palaeogeographic interest in Scottish waters. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to sub-seabed deposits of palaeoenvironmental potential through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from sediment removal arising from the Proposed Development (construction and operation phases, respectively).

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) has identified 25 locations of known or likely archaeological sites in Scottish waters, including wreck sites, debris fields and magnetic anomalies (15 within 12 NM and 10 beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of sediment removal with the potential for indirect impacts. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from sediment removal arising during the construction and operation phases of the Proposed Development.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified 467 features equivalent to low potential geophysical or magnetic anomalies (311 within 12 NM and 156 beyond, in Scottish waters). Magnetic anomalies of high archaeological potential were included within the 25 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from sediment removal arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified the potential for additional palaeogeographic features and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.4. Indirect impacts (scouring) to marine archaeology – EGL 2

Indirect impact pathways for EGL 2 in relation to marine archaeology are similar to the Proposed Development. Changes to hydrodynamic regimes at the seabed from new infrastructure and installations initiate a pathway for potential indirect impacts to marine archaeology from scouring. **Chapter 6: Marine Physical Processes** indicates a very low to low potential for scouring around infrastructure of the Proposed Development. Such scouring would be highly localised to the infrastructure and may continue for the lifespan of the Proposed Development.

In consideration of the limited ZoI for indirect impacts arising from scouring, cumulative effects are likely to occur where activities of the Proposed Development overlap with those of EGL 2.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.3.1 and **Section 14.8.3.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from scouring associated with the Proposed Development (construction and operation phases, respectively).

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) has identified 33 features of palaeogeographic interest in Scottish waters. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to sub-seabed deposits of palaeoenvironmental potential through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from scouring arising from the Proposed Development (construction and operation phases, respectively).

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report (AECOM, 2022b) has identified 25 locations of known or likely archaeological sites in Scottish waters, including wreck sites, debris fields and magnetic anomalies (15 within 12 NM and 10 beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of scouring with the potential for indirect impacts. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from scouring arising during the construction and operation phases of the Proposed Development.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified 467 features equivalent to low potential geophysical or magnetic anomalies (311 within 12 NM and 156 beyond, in Scottish waters). Magnetic anomalies of high archaeological potential were included within the 25 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from scouring arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 12: Marine Archaeology of the EGL 2 Environmental Appraisal Report has identified the potential for additional palaeogeographic features and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the EGL 2 project concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.5. Direct impacts to marine archaeology – Morven OWF

The Proposed Development and Morven OWF do not overlap spatially, eliminating the potential for cumulative effects arising from direct impacts to:

- Known archaeological sites and high/medium potential geophysical anomalies;
- Low potential geophysical and magnetic anomalies; and
- Unknown archaeological sites and remains.

The Morven OWF Scoping Report (RPS, 2023) was informed by two preliminary desk-based assessments (DBAs), which did not extend to the identification of low potential geophysical and magnetic anomalies (MSDS Marine, 2022; MSDS Marine, 2023). A series of known and possible archaeological sites were identified, along with a general potential for hitherto unidentified sites and remains, however, the distance of these from the Proposed Development indicates no potential for cumulative direct impacts. These receptors have, therefore, not been assessed further here.

Cumulative effects may, however, result from direct impacts to sub-seabed deposits of palaeoenvironmental potential. Such deposits, associated with known geological formations, occur widely across the central North Sea region and have been provisionally identified within both project extents.

Chapter 9.4: Marine Archaeology of the Morven OWF Scoping Report (RPS, 2023) proposes the scoping out of further assessment of direct impacts to marine archaeology (including sub-seabed deposits of palaeoenvironmental potential), on the basis of the project's mitigation measures (namely, the implementation of a WSI and PAD and archaeological input into geotechnical survey design). In consideration of the status of the Morven OWF project (see **Table 14-17**), the results of a specific and detailed impact assessment were not available to inform the cumulative assessment presented here.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.2.1 and **Section 14.8.2.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

The preliminary DBAs for Morven OWF identified the possible presence of four geological formations within the project's scoping boundary holding the potential for palaeoenvironmental remains (MSDS Marine, 2022; MSDS Marine, 2023). Mitigation measures for this project ensure archaeological input into future survey campaigns, geoarchaeological analysis of geotechnical samples and adherence to a WSI and PAD. Although the results of a detailed impact assessment were not available for Morven OWF, after consideration of the project-specific mitigation, a negligible or low significance of effect may be considered likely.

The cumulative effect of direct impacts to sub-seabed deposits of palaeoenvironmental potential is provisionally assessed as **Minor** and **Not Significant**, however, this is subject to change based on the results of future impact assessment conducted by the Morven OWF project.

14.11.4.6. Indirect impacts (redeposition of suspended sediment) to marine archaeology – Morven OWF

Indirect impact pathways for Morven OWF in relation to marine archaeology are similar to the Proposed Development and may comprise:

- Redeposition of suspended sediment;
- Sediment removal; and/or
- Scouring.

Chapter 6: Marine Physical Processes indicates a maximum distance of 13.6 km from the release location for sediment redeposition, however, the maximum distance of measurable change in suspended sediment would be 4.6 km. Sediment removal and scouring would be highly localised to the causal activity. This presents a potential overlap between the Proposed Development and Morven OWF and the potential for cumulative effects to marine archaeology through indirect impacts associated with the redeposition of suspended sediment.

Given the distance of 1.98 km between the two projects (see **Table 14-17**) and the anticipated highly localised extent of any impacts arising from sediment removal and scouring, cumulative indirect impacts through these pathways would not occur and have, therefore, not been assessed further here.

Chapter 9.4: Marine Archaeology of the Morven OWF Scoping Report (RPS, 2023) proposes the scoping out of further assessment of indirect impacts to marine archaeology from sediment disturbance, deposition and alteration of transport regimes, on the basis of the project's mitigation measures (namely, the implementation of a WSI and PAD). In consideration of the status of the Morven OWF project, the results of a specific and detailed impact assessment were not available to inform the cumulative assessment presented here.

The Morven OWF Scoping Report was informed by two preliminary desk-based assessments, which did not extend to the identification of low potential geophysical and magnetic anomalies. These receptors have, therefore, not been assessed further here. Four geological units comprising sub-seabed deposits of palaeoenvironmental potential were provisionally identified, however, this receptor is not considered susceptible to change through the pathway of redeposition of suspended sediment, removing the potential for cumulative effects.

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

The DBAs informing the Morven OWF Scoping Report, identified ten wreck sites and one aircraft crash site falling under the Protection of Military Remains Act 1986 within the Array Area (MSDS Marine, 2022) and a further 52 wreck or potential wreck sites within the Export Cable Corridor and Metocean buoy locations (MSDS Marine, 2023). The Scoping Report proposes the use of AEZs to remove marine archaeology receptors from the extent of potential indirect impacts, however, this extent had not been presented in relation to marine archaeology. Chapter 3: Project Description of the Morven OWF Scoping Report (RPS, 2023) includes several activities which may present a similar significance of effect to marine archaeology as the Proposed Development, including boulder and sandwave clearance. Dissimilar activities, such as foundation installation, may have a limited ZoI, in consideration of the construction method, e.g. suction caissons.

The proposals for descoping of indirect impacts suggest a perceived Minor or Negligible significance of effect, though the Archaeological Curator (Historic Environment Scotland) may object and the results of an appropriate impact assessment would be required to confidently assess any cumulative effects.

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

The DBAs informing the Morven OWF Scoping Report (MSDS Marine, 2022; MSDS Marine, 2023), highlighted the potential for hitherto unknown archaeological sites and remains to be identified within the project's boundary. Although the Scoping Report does not explicitly highlight the potential for this receptor, appropriate measures are included which would mitigate any impacts. In the absence of a detailed impact assessment, the potential for and significance of cumulative impacts cannot be made with confidence.

14.11.4.7. Direct impacts to marine archaeology – Cenos OWF

The Cenos OWF overlaps with the Proposed Development at KP 576. Both projects involve activities directly affecting the seabed, with the potential to result in cumulative effects to marine archaeology receptors. Each project cable will run independently from one another, overlapping only at KP 576 of the Proposed Development, requiring project-specific route preparation and burial and/or surface lay. As outlined in Chapter 5: Project Description of the Cenos Environmental Impact Assessment (Xodus, 2024a), the maximum width of seabed disturbance from cable trenching is approximately 20 m. Thus, it is assumed the worst-case cumulative effect of seabed disturbance will be approximately double that from the Proposed Development (using the maximum width of seabed disturbance presented by **Table 14-5** of this chapter).

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.2.1 and **Section 14.8.2.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified three geological units of palaeoenvironmental potential. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of direct impacts to sub-seabed deposits of palaeoenvironmental potential is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.2.2 and **Section 14.8.2.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified 10 locations of known or likely archaeological sites, including wreck sites, potential wrecks and debris fields (two within 12 NM and eight beyond). Embedded mitigation implements the use of AEZs, removing the pathway for direct impacts to this receptor. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of direct impacts to known archaeological sites and high/medium potential geophysical anomalies is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.2.3, 14.8.2.4, 14.8.2.8 and **14.8.2.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from direct impacts during the construction and operation phases of the Proposed Development.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified 205 features equivalent to low potential geophysical or magnetic anomalies (40 within 12 NM and 165 beyond). Magnetic anomalies of high archaeological potential were included within the 10 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of direct impacts to low potential geophysical and magnetic anomalies are assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.2.5 and **Section 14.8.2.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from direct impacts during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified the potential for additional palaeoenvironmental features and deposits and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of direct impacts to unknown archaeological sites and remains is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.8. Indirect impacts (redeposition of suspended sediment) to marine archaeology – Cenos OWF

Indirect impact pathways for the Cenos OWF in relation to marine archaeology are estimated to be significantly less than the Proposed Development. Chapter 8: Marine Geology, Oceanography and Coastal Processes of the Cenos Environmental Impact Assessment (Xodus, 2024c) states that the thickness of redeposited sediment will be immeasurable from background processes beyond 500 m from the sediment release location. **Chapter 6: Marine Physical Processes** of the MEAp indicates a maximum distance of 13.6 km from the release location for sediment redeposition, however, the maximum distance of measurable change (from background changes) in suspended sediment would be 4.6 km. This presents a potential overlap between the two projects and the potential for cumulative effects to marine archaeology through indirect impacts associated with the redeposition of suspended sediment.

Sub-seabed deposits of palaeoenvironmental potential have not been identified as susceptible to indirect impacts arising from suspended sediment deposition and are, therefore, not assessed further here.

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified 10 locations of known or likely archaeological sites, including wreck sites, potential wrecks and debris fields (two within 12 NM and eight beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of the greatest sediment deposition with the potential for indirect impacts. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified 205 features equivalent to low potential geophysical or magnetic anomalies (40 within 12 NM and 165 beyond). Magnetic anomalies of high archaeological potential were included within the 10 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of redeposition of suspended sediments are assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from redeposition of suspended sediments arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified the potential for additional palaeoenvironmental features and deposits and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.9. Indirect impacts (sediment removal) to marine archaeology – Cenos OWF

Indirect impact pathways for the Cenos OWF in relation to marine archaeology are similar to the Proposed Development. Sediments potentially protecting and/or stabilising marine archaeology will be removed during construction and possibly also operation and decommissioning activities, initiating a pathway for potential indirect impacts through increased exposure and destabilisation. **Chapter 6: Marine Physical Processes** of this MEAp indicates that a high concentration of the sediment released during activities will be

redeposited within 10 m of the release location, settling shortly after the causal event. The potential for marine archaeology to be left exposed and/or destabilised for long periods of time would, therefore, be limited.

In consideration of the limited ZoI for indirect impacts arising from sediment removal, cumulative effects are likely to occur where activities of the Proposed Development overlap with those of the Cenos OWF.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.3.1 and **Section 14.8.3.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from sediment removal associated with the Proposed Development (construction and operation phases, respectively).

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified three geological units of palaeoenvironmental potential. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to sub-seabed deposits of palaeoenvironmental potential through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from sediment removal arising from the Proposed Development (construction and operation phases, respectively).

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified 10 locations of known or likely archaeological sites, including wreck sites, potential wrecks and debris fields (two within 12 NM and eight beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of sediment removal with the potential for indirect impacts. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from sediment removal arising during the construction and operation phases of the Proposed Development.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified 205 features equivalent to low potential geophysical or magnetic anomalies (40 within 12 NM and 165 beyond). Magnetic anomalies of high archaeological potential were included within the 10 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of sediment removal is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from sediment removal arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified the potential for additional palaeoenvironmental features and deposits and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of redeposition of suspended sediments is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.10. Indirect impacts (scouring) to marine archaeology – Cenos OWF

Indirect impact pathways for the Cenos OWF in relation to marine archaeology are similar to the Proposed Development. Changes to hydrodynamic regimes at the seabed from new infrastructure and installations initiate a pathway for potential indirect impacts to marine archaeology from scouring. Both Chapter 8: Marine Geology, Oceanography and Coastal Processes of the Cenos Environmental Impact Assessment (Xodus, 2024c) and **Chapter 6: Marine Physical Processes** of the MEAp indicate a very low to low potential for scouring around project-related infrastructure, that any scouring would be highly localised to the infrastructure and may continue for the lifespan of each respective project.

In consideration of the limited ZoI for indirect impacts arising from scouring, cumulative effects are likely to occur where activities of the Proposed Development overlap with those of the Cenos OWF.

Sub-seabed deposits of palaeoenvironmental potential

Section 14.8.3.1 and **Section 14.8.3.6** of this chapter concluded that there are no significant adverse effects to sub-seabed deposits of palaeoenvironmental potential resulting from scouring associated with the Proposed Development (construction and operation phases, respectively).

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified three geological units of palaeoenvironmental potential. Embedded mitigation requires archaeological input into geotechnical survey design and geoarchaeological analysis of acquired samples. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to sub-seabed deposits of palaeoenvironmental potential through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Known archaeological sites and high/medium potential geophysical anomalies

Section 14.8.3.2 and **Section 14.8.3.7** of this chapter concluded that there are no significant adverse effects to known archaeological sites and high/medium potential geophysical anomalies resulting from scouring arising from the Proposed Development (construction and operation phases, respectively).

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) identified 10 locations of known or likely archaeological sites, including wreck sites, potential wrecks and debris fields (two within 12 NM and eight beyond). Embedded mitigation implements the use of AEZs, removing the receptor from the ZoI of scouring with the potential for indirect impacts. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to known archaeological sites and high/medium potential geophysical anomalies through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Low potential geophysical and magnetic anomalies

Sections 14.8.3.3, **14.8.3.4, 14.8.3.8** and **14.8.3.9** of this chapter concluded that there are no significant adverse effects to low potential geophysical anomalies and magnetic anomalies, respectively, resulting from scouring arising during the construction and operation phases of the Proposed Development.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified 205 features equivalent to low potential geophysical or magnetic anomalies (40 within 12 NM and 165 beyond). Magnetic anomalies of high archaeological potential were included within the 10 locations covered by AEZs, detailed above. Embedded mitigation requires further investigation through opportunities such as diver and ROV survey and implementation of an archaeological watching brief during clearance of these anomalies. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to low potential geophysical and magnetic anomalies through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

Unknown archaeological sites and remains

Section 14.8.3.5 and **Section 14.8.3.10** of this chapter concluded that there are no significant adverse effects to unknown archaeological sites and remains resulting from scouring arising during the construction and operation phases of the Proposed Development, respectively.

Chapter 16: Marine Archaeology of the Cenos Environmental Impact Assessment (Xodus, 2024b) has identified the potential for additional palaeoenvironmental features and deposits and seabed anomalies of archaeological interest. Embedded mitigation requires the implementation of a PAD for the reporting of any hitherto unknown archaeological discoveries and archaeological review of any future geotechnical investigations. After consideration of the project-specific mitigation, the Cenos OWF concludes a negligible significance of effect.

The cumulative effect of indirect impacts to unknown archaeological sites and remains through the pathway of scouring is assessed as **Minor** and **Not Significant** (construction and operation phases).

14.11.4.11. Stage 4 assessment conclusions

Cumulative effects upon marine archaeology have been assessed for all direct physical impacts, and indirect impacts arising from redeposition of suspended sediment, sediment removal and scour for projects EGL 2, Morven OWF, Cenos OWF. No significant cumulative effects were predicted, based on current available evidence.

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