Liverpool Bay CCS Ltd

HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

Environmental Statement Report
Volume 4, appendix U: Outline Written Scheme of Investigation and Protocol for Archaeological Discoveries

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Liverpool Bay CCS Limited
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WSI and PAD

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Glossary

Term	Meaning
Effect	The consequence of an impact.
Environmental Impact Assessment	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Impact Assessment (EIA) Report.
Impact	A change that is caused by an action.
Mitigation Measure	Measure which would avoid, reduce, or remediate an impact.
Palaeochannel	A geological term describing a remnant of an inactive river or stream channel that has been filled or buried by younger sediment
Palaeoenvironmental	An environment of a past geological age
Project	The HyNet Carbon Dioxide Transportation and Storage Project.
Project Design Envelope (PDE)	Also known as the Rochdale Envelope, the PDE concept is routinely utilised in both onshore and offshore planning applications to allow for some flexibility in design options, particularly offshore, and more particularly for foundations and turbine type, where the full details of the project are not known at application submission but where sufficient detail is available to enable all environmental impacts to be appropriately considered during the EIA.
Proposed Development	The offshore components of the Project which are subject of this Environmental Statement, as described in volume 1, chapter 3.
The Applicant	This is Liverpool Bay CCS Ltd.

Acronyms

Acronym	Description
AD	Anno Domini
ADS	Archaeological Data Service
AEZ	Archaeological Exclusion Zone
BP	Before Present
CCS	Carbon Capture and Storage
CIfA	Chartered Institute for Archaeologists
CLV	Cable Lay Vessel
COWRIE	Collaborative Offshore Wind Research Into The Environment
CPAT	Clwyd-Powys Archaeological Trust
DAC	Data Archive Centre
ED50	European Datum 1950
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
HE	Historic England
JCCC	Joint Casualty and Compassionate Centre
LAT	Lowest Astronomical Tide
MASA	Marine Archaeology Study Area
MEDIN	Marine Environment Data and Information Network

Acronym	Description
MMO	Marine Management Organisation
MPS	Marine Policy Statement
MHWS	Mean High Water Springs
MLWM	Mean Low Water Mark
MOD	Ministry of Defence
NLO	Named Locations
NRW	Natural Resources Wales
NSC	Non-submarine contact
OASIS	Online Access to the Index of Investigations
PAD	Protocol for Archaeological Discoveries
RCAHMW	Royal Commission on the Ancient and Historic Monuments of Wales
ROV	Remotely Operated Vehicle
SCAUM	Standing Conference of Archaeological Unit Managers
SPVA	Service Personnel and Veterans Agency
TAEZ	Temporary Archaeological Exclusion Zone
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
UTM	Universal Transverse Mercator
WIS	Western Irish Sea
WIS-A	Western Irish Sea Formation - A
WWII	World War II
WSI	Written Scheme of Investigation

Units

Units	Description
%	Percentage
km	Kilometres (distance)
km^2	Square kilometres (area)
m	Meters (distance)
nm	Nautical miles (distance; 1nm = 1.852km)

Contents

Tables

Figures

1 OUTLINE WRITTEN SCHEME OF INVESTIGATION (WSI)

1.1 Introduction

This document forms an Outline Written Scheme of Investigation (WSI), produced to accompany the Marine Archaeology Environmental Statement (ES) in support of the HyNet Carbon Dioxide Transportation and Storage Project (hereafter referred to as "the Project") and the offshore components of the project (hereafter referred to as "the Proposed Development").

The purpose of the document is to set out details demonstrating the mitigation for the Project, and how this mitigation will be enacted. The document also sets out further work which has been recommended within the ES chapter.

This document has been produced in line with best practice guidance, in particular, Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects by The Crown Estate (2021). While this guidance was prepared for renewable energy projects, it has wider relevance to other industries and has therefore been referred to here.

1.1.1 Location

The proposed development is located in the CS004 CO_2 Appraisal and Storage Licence area (NSTA, 2020), approximately 12 km to the north of the Welsh coastline and 2 km west of the English coastline (Figure 1.1). The licence area covers approximately 576.82 km^2 and encompasses the depleted hydrocarbon reservoirs of the Hamilton, Hamilton North, and Lennox fields. The corridor shore approach is located to the north of Talacre in Flintshire, Wales, near the mouth of the Dee Estuary.

The area which has been considered by the Marine Archaeology assessment can be broken down into three parts (all shown on Figure 1.1):

- the Area of Project Physical Work.
- the Eni Development Area.
- the wider Marine Archaeology Study Area (MASA).

The Area of Project Physical Work covers a restricted area in which proposed development activities and the insertion of new infrastructure including cable laying, well drilling and platform construction, as well as associated activities such as sand wave clearance are to be focused.

The Eni Development Area covers a wider area. While the main proposed development impacts will be focused within the Area of Project Physical Work associated impacts such as vessel anchoring may occur within the Eni Development Area. As such both areas have been treated as the 'Site', and all archaeological remains within have been assessed.

The wider MASA forms a 2 km buffer around the Eni Development Area, up to Mean High Water Springs (MHWS) and has been defined to better characterise the archaeological resource within the offshore parts of the Site (set out within volume 3, appendix N (MSDS Marine 2023) and volume 2, chapter 11).

The mitigation set out within this document is focused on the Area of Project Physical Work and the Eni Development Area. No direct impacts will occur within the wider MASA and therefore no mitigation is proposed.

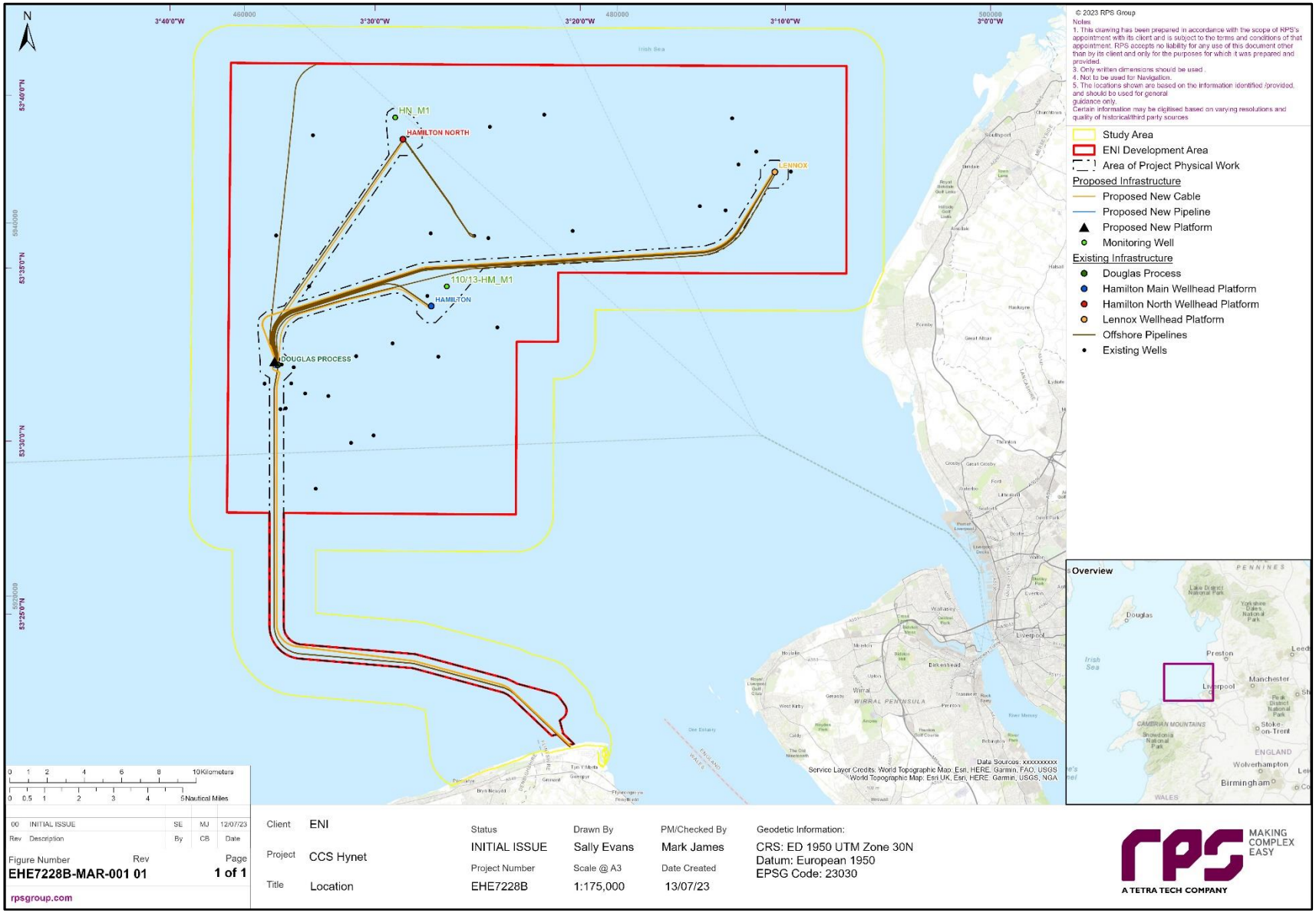

Figure 1.1: Site Location

1.1.2 Aims and objectives

The objectives of the WSI follow best practice guidance set out by The Crown Estate (2021). The objectives are to:

- set out the roles and respective responsibilities of the Applicant, Contractors, and Retained Archaeologist and Archaeological Contractor(s) and formal lines of communication between the parties and with Archaeological Curator(s) (see section 1.2).
- outline the known and potential archaeological receptors that could be impacted by the project (see section 1.3).
- outline the agreed mitigation and archaeological actions that are to take place in various circumstances (see section 1.5, in particular section 1.5.3).
- set out the importance of research frameworks in setting objectives that are delivered through realisation of the work (see section 1.4)provide methodologies for these archaeological actions, to be employed on archaeological work conducted in the post consent period (see sections 1.5 and 1.6).

1.1.3 Guidance

As described above, this document has been produced in line with best practice guidance, including:

- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects by (The Crown Estate, 2021).
- Planning Policy Wales Technical Advice Note 24: The Historic Environment.
- Managing the Marine Historic Environment of Wales (Cadw/Welsh Government, 2020).
- Historic England's (HE) Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008).
- Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Cadw, 2011).
- Code of Conduct (Chartered Institute for Archaeologists (CIfA, 2014 (updated 2022)).
- Standard and Guidance for Historic Environment Desk Based Assessment (CIfA, 2014 (updated 2020)).
- COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007).
- Offshore Renewables Protocol for Archaeological Discoveries (The Crown Estate, 2014).
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011).
- Marine Geophysics Data Acquisition, Processing and Interpretation, Guidance Notes (English Heritage, 2013, currently under review by MSDS Marine for Historic England).
- Identifying and Protecting Palaeolithic Remains (English Heritage, 1998).
- Military Aircraft Crash Sites (English Heritage, 2002).
- Aircraft Crash Sites at Sea (Wessex Archaeology, 2008).
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee, 2006).

1.1.4 Project description

1.2 Implementation of the WSI

This section sets out the responsibilities of the Applicant and lines of communication during the pre-construction, construction, operation, maintenance and decommissioning process for the proposed development with the aim of ensuring that the archaeological mitigation measures described are fully implemented in a timely manner that does not interfere with the smooth running of the proposed development programme.

1.2.1 Responsibilities and communications

Primary responsibility for the delivery of this WSI lies with Liverpool Bay CCS Limited ('the Applicant'). Through project documentation and procedures, the implementation of this WSI will involve a range of archaeological contractors and curators.

The Applicant shall employ the services of a suitably qualified and experienced Archaeological Consultant (the Retained Archaeologist) to ensure the effective implementation of the WSI and other relevant commitments in relation to archaeology.

Additional Archaeological Contractors may be employed, on an ad hoc basis, by either the Applicant or the Retained Archaeologist if this task is delegated to them by the Applicant. Suitably qualified Archaeological Contractors may be called to provide a range of services relating to specialist archaeological provision (e.g. fieldwork, geotechnical, analysis etc.).

The Historic England Marine Planning Unit is the Archaeological Curator responsible for heritage matters offshore in English waters. Historic England's Science Advisor for the North West region, where relevant, will also be consulted with regard to activities undertaken as part of this WSI.

In Welsh waters the relevant Archaeological Curator is Cadw, with further support from the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW). Both will be consulted with regard to activities undertaken as part of this WSI.

Local authority archaeologists are also curators down to the low water mark. This is relevant for the intertidal area which lies within the area of Clwyd-Powys Archaeological Trust (CPAT). CPAT will be consulted with regard to activities undertaken as part of this WSI which fall within the intertidal zone.

Contact with the Archaeological Curator(s) will be administered by the Applicant under advice from the Retained Archaeologist. In relation to the implementation of the WSI, the Retained Archaeologist will report to the Applicant's appointed project contact. Interaction with the Applicant's construction team will be administered by the project contact, advised by the Retained Archaeologist.

The responsibilities of the Retained Archaeologist will include:

- maintaining, reviewing and updating the WSI, as required.
- advising the Applicant on the necessary archaeological works and input required to the stipulations of this WSI are met.
- advising the Applicant which elements warrant archaeological involvement.
- advising the Applicant in the course of evaluating scope of work specifications on their capacity to meet archaeological requirements.
- advising the Applicant on the necessary interaction with third parties with archaeological interests, including the Archaeological Curator.
- advising the Applicant on the implementation of generic archaeological requirements applicable to all construction activities.

- advising the Applicant on the micrositing of infrastructure covered by this WSI, based upon archaeological results from Environmental Impact Assessment (EIA) and pre-construction surveys.
- advising the Applicant on Method Statements for archaeological investigations.
- preparing Method Statements for archaeological activities.
- ensuring that the project contact copies Method Statements to the Archaeological Curator for approval;
- implementing and monitoring the Protocol for reporting finds of archaeological interest based on the Protocol for Archaeological Discoveries (PAD).
- monitoring the work of and liaising with the Archaeological Contractor(s) where this is not the Retained Archaeologist.
- monitoring the preparation and submission of Archaeological Reports, as appropriate, and making them available to the Archaeological Curator.
- preparing provisions for the management of the project archives in consultation with an appropriate Museum.
- advising the Applicant on final arrangements for analysis, archive deposition, publication and popular dissemination and the necessary schedule for these deliverables.

Where Method Statements, reports or other deliverables are submitted by the Applicant to the Archaeological Curator, their agreement/acceptance will be assumed if no contrary response is received within ~~30~~ working days of submission.

All relevant key contractors engaged in the construction of the project shall:

- familiarise themselves with the generic requirements of the WSI and make them available to their staff and / or subcontractors.
- obey legal obligations in respect of 'wrecks' and 'treasure' under the Merchant Shipping Act 1995 and the Treasure Act 1996 respectively.
- respect constraint maps, Archaeological Exclusion Zones (AEZs) and Temporary Archaeological Exclusion Zones (TAEZs).
- assist and afford access to relevant activities by the archaeologists employed by the Applicant.
- inform the Retained Archaeologist of any environmental constraint or matter relating to health, safety and welfare of which they are aware that is relevant to the archaeologists' activities.
- implement the Protocol for reporting finds of archaeological interest.

Other roles are referred to within this document. Where this is the case these roles, and associated definitions, can be found within the protocol for reporting finds of archaeological interest (see section 1.5.7 and Appendix U1). These roles include the Site Champion and Nominated Contact.

1.2.2 Arrangements for reviewing the WSI

Provision will be made for the WSI to be revised as appropriate should elements of the project change or particular archaeological issues come to light. Any revisions will be prepared by the Retained Archaeologist and submitted to the Applicant who will ensure they are submitted to, and approved by, the relevant Regulator including Natural Resources Wales (NRW) and Marine Management Organisation (MMO), in addition to other relevant licencing and consenting bodies in consultation with the relevant Archaeological Curator. Approval by the Curator will be assumed if no response is received within 30 working days of submission.

1.2.3 Monitoring compliance with the WSI

Compliance with this WSI will be ensured by regular meetings between the Retained Archaeologist and the Applicant. The regularity of meetings may alter during different phases of the development. However, regular contact will be maintained to ensure compliance with the WSI. These meetings ensure compliance through agendas which include discussions of the construction programme and any upcoming work which may require archaeological input, as per the stipulations of this WSI. The Retained Archaeologist also advises the Applicant of the required scope of any necessary works, and plans these works at the meetings and other meetings as required.

Following this advice, appropriate method statements will be prepared as required for each element of the project which requires archaeological involvement, in line with the requirements of the WSI. These will be submitted to the Regulator and the Archaeological Curator for approval. Approval by the Curator will be assumed if no response is received within 20 working days of submission. The Retained Archaeologist will ensure compliance with these method statements during the subsequent works, thereby also ensuring compliance with the WSI.

The performance of the WSI will also be monitored through the provision of archaeological reports, prepared to inform on the results of various activities undertaken under its auspices. These include a review of new geophysical, geotechnical and environmental data; and the implementation of the PAD across all works associated with the project. These reports will be submitted to the Applicant who will ensure their dissemination to the Archaeological Curators.

The responsibility for ensuring the implementation of the PAD; (Appendix 1) rests with the Applicant, who will ensure that its agents and contractors are contractually bound to implement the PAD.

Based on section 1.5.7 and Appendix 1 below, the Applicant and the Retained Archaeologist will agree the system for archaeological reporting through the PAD.

During any site evaluation/investigation or construction work that has the potential to affect any archaeological heritage assets, the Retained Archaeologist will advise the Applicant who will liaise directly with the Archaeological Curator with regard to site monitoring and reporting. The Applicant will be kept informed of any contact between the Retained Archaeologist and the Archaeological Curator. A programme of monitoring visits (if deemed appropriate) by the Archaeological Curator and the Applicant will be agreed in advance of the commencement of work on site.

1.2.4 Health and safety

The Retained Archaeologist will ensure that any method statements prepared to meet the requirements of the WSI are compliant with the requirements of the Applicant's Health and Safety Plans for the project.

Health and Safety considerations will be of paramount importance in conducting all fieldwork. Safe working practices will override archaeological considerations at all times.

All work will be carried out in accordance with the Health and Safety at Work etc. Act 1974, the Management of Health and Safety at Work Regulations 1999, the SCAUM (Standing Conference of Archaeological Unit Managers) health and safety manual Health and Safety in Field Archaeology (SCAUM, 2007) and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

1.3 Summary of known and potential archaeology

A baseline assessment including desk based assessment and archaeological assessment of geophysical survey data has been undertaken in support of the ES. The methodology and results of this assessment are set out in detail within volume 3, appendix N Marine Archaeology Technical Report (MSDS Marine, 2023). The following sections contain a summary of the findings.

1.3.1 Summary of designated heritage assets

One designated heritage asset lies within the Area of Project Physical Work. This is:

- the Protected Wreck of the *Resurgam* (volume 3, appendix N: E_001). The *Resurgam* was an experimental submarine built in 1870. It is designated under the Protection of Wrecks Act 1973, and has an associated designated area with a 300 m radius. The wreck itself lies within the Study Area but the designated circle extends to within the Area of Project Physical Work and Eni Development Area.

Two other designated heritage assets lie within the MASA, but beyond the Area of Project Physical Work and the Eni Development Area. These are:

- the Scheduled wreck of the *Lelia*, a paddle steamer built in 1864 and associated with the British involvement in the American Civil War (volume 3, appendix N: E_002). It is designated under the Ancient Monuments and Archaeological Areas Act 1979 and lies within the MASA, c. 10 m beyond the Eni Development Area boundary, on its eastern side.
- the Grade II Listed Point of Ayr Lighthouse, thought to have been built in c. 1776 (volume 3, appendix N: E_003). It is designated under the Planning (Listed Buildings and Conservation Areas) Act 1990, and lies c. 1 km to the east of the proposed Landfall site and Eni Development Area.

1.3.2 Summary of non-designated heritage assets

A series of non-designated heritage assets lie within the Area of Project Physical Work, Eni Development Area, and MASA. These are summarised below and are based on all available desk based and geophysical data, tying in information from pre-existing datasets and the archaeological assessment of geophysical survey data undertaken as part of this project (MSDS Marine, 2023). Full details can be found within volume 3, appendix N. Magnetic anomalies are listed separately in volume 3, appendix N.

There is a total of 134 records within the MASA, 176 within the Eni Development Area, and 110 within the Area of Project Physical Work, giving a total of 420 records (including the three designated heritage assets detailed above). The majority relate to heritage assets, however, a number of geophysical anomalies have been interpreted as of being geological in nature. These are included in

Table 1.1 below for completeness but are not considered further.

The remainder of the records include a range of wreck and potential wreck sites, other maritime remains (ranging from the remains of oil platforms, to navigation beacons, unidentified obstructions, and other potential debris), palaeolandscape features, terrestrial features and records deriving from documentary evidence, including Named Locations (NLOs) of vessels lost in the area where there are currently no known seabed remains.

Table 1.1: Summary Of Non-designated Heritage Assets

Broad Category	Type	Area of Project Physical Work	Eni Development Area	Study Area
Wreck remains	Wreck	2	30	20
	Wreck (possible)			1
	Wreck (probable)		1	
	Wreck or Ballast mound		1	
	Wreck or beacon		2	
	Wreck or debris		2	1
	Wreck or Wreckage (possible)		1	
	Wreck/Geology			1

Broad Category	Type	Area of Project Physical Work	Eni Development Area	Study Area
	Wreckage		13	
	Possible wreck	3		6
	Possible wreck or cargo			2
	Possible wreckage		1	
Other maritime remains	Anchor, chain and cable		2	
	Beacon		3	
	Chain, Cable, or Rope	4		1
	Collapsed platform		1	
	Debris	5	3	3
	Debris - likely infrastructure	20		1
	Disused wartime tower			1
	Fisherman's fastener		1	3
	Fishing gear	3		
	Tower		2	
	Foul		2	
	Geophysical anomaly - debris		1	2
	Geophysical anomaly - origin unknown		3	
	Geophysical anomaly - possible debris		2	
	Geophysical anomaly - potential anchor cable			1
	Mound	1		2
	Obstruction		3	2
	Obstruction: Non-submarine contact		3	2
	Pipe			1
	Platform		1	
	Possible oil rig leg		1	
	Potential debris	32	1	5
	Unidentified object			1
	Unidentified obstruction	9	75	3
	Unknown	1		
	Seabed disturbance	1		
	Linear feature	3		4
	Masonry			1
	Mattresses	2		
	Spoil ground		1	
Geological features	Geology	5	10	1
	Likely geological	14	1	2
Palaeolandscape Features	Glacial tunnel valley			1
	Footprints			1
Terrestrial and Coastal Features	Terrestrial - Anti-glider poles			1
	Terrestrial - boundary stone			2

Broad Category	Type	Area of Project Physical Work	Eni Development Area	Study Area
	Terrestrial - Lifeboat house			1
	Terrestrial - Lighthouse			1
	Terrestrial - lifeboat station			1
	Terrestrial - lighthouse cottages			1
	Terrestrial - Pillbox			6
	Terrestrial - Summer camp			1
	Terrestrial asset - holiday park			1
	Terrestrial asset - lighthouse cottages			1
	Terrestrial asset - Swimming baths			1
	Terrestrial- slipway			1
	Terrestrial - Event			3
	Terrestrial - Findspot			1
	Terrestrial - position in error	2	1	
	Test record.		4	
Documentary Records	NLO			1
	Aircraft (NLO)		2	7
	Wreck (NLO)	2	1	27
	Wreck (not found)	1	1	
	Navigational aid shown on historic maps			6
	Seascape			2
	Grand Total	**110**	**176**	**134**

1.3.3 Submerged prehistoric archaeology

The prehistoric archaeological record of the UK covers the period from the earliest hominin occupation, potentially as far back as 970,000 BP, to the end of the Iron Age and the Roman invasion of Britain by Claudius in AD 43. The coastline of the UK changed drastically during this period and large tracts of what is now the seabed were once subaerially exposed. The UK has been affected by several glacial events over the last 1 million years; including the Anglian (480 ka BP to 430 ka BP), the Wolstonian (350 ka BP to 132 ka BP), and the Devensian (122 ka BP to 10 ka BP), and intervening marine transgressions all of which have influenced archaeological potential.

Prehistoric archaeological potential is gauged with reference to evidence for human activity in the UK during each period, and the contemporary environment within the MASA. Depositional environment and post-depositional factors are also key to understanding potential, and as such geological deposits present within the Site form an important consideration in understanding archaeological, palaeoenvironmental and palaeolandscape potential. Deposits with potential for prehistoric archaeological remains, or palaeoenvironmental information are generally those laid during periods of aerial exposure or by fluvial process, rather than sub-glacial or marine deposits. However, there is also potential for archaeological material to be redeposited or reworked within secondary contexts as a result of fluvial erosion or glacial processes (Hosfield and Chambers, 2004), this has been taken into account within the assessment.

Assessment of geophysical, geotechnical and desk based sources has led to the identification of three main Quaternary units within the MASA, overlying bedrock. The Quaternary units represent the environmental shift

from glacially and proglacially dominated conditions of the Devensian (represented by Unit III and II), to later potentially pre-transgressional environments (possibly represented by Units II and I), followed by the modern active marine environment which characterises the MASA today (Unit I). These units, and their archaeological and palaeoenvironmental potential are summarised below.

1.3.3.1 Middle and Upper Palaeolithic

Unit III and Unit II derive from these periods. Unit III is associated with the Cardigan Bay Formation, thought to have been laid down as a sub-glacial deposit in the Wolstonian or Devensian glaciation. Unit III therefore holds very limited archaeological potential. However, material may survive on the surface of the unit where later subaerial exposure may have occurred.

Unit II represents the late Devensian Western Irish Sea (WIS) A Formation. This unit is thought to reflect glacial, glaciomarine or deltaic/prodeltaic conditions during the Devensian, and evidence of channelling to the west of the MASA may reflect outwash deposits or other glacial features which may extend to within the MASA. The inhospitable conditions represented by the bulk of the unit indicate limited archaeological potential, though the surface of the unit (if subaerially exposed following glacial retreat) may hold archaeological potential where not eroded by later forces. Palaeoenvironmental remains may also survive within this unit.

The chronology of landscape changes in the area during the Upper Palaeolithic to Mesolithic indicate the likelihood that the western half of the MASA was submerged by 10 k BP (by the end of the Upper Palaeolithic), with eastern areas and the cable route being submerged from 8 k BP to 6 k BP.

1.3.3.2 Mesolithic

Unit I is interpreted as the Surface Sands Formation. This formation includes two members. The lower (earlier) SL2 member, represents intertidal to marine environments. A borehole taken to the South-west of the MASA produced evidence of reed beds dating to 9,200 BP within this member, indicating a potential pre-inundation land surface dating to the early Mesolithic. Landscape modelling by Fitch *et al*

. (2011) also indicate potential for fluvial features within this Unit, which (when coupled with current sea level curve data) indicate potential within the eastern half of the Site from 10 k BP. The southern part of the cable route also holds particular potential for Mesolithic remains, given the proximity of Mesolithic remains on the North West coastline (e.g. at Rhyl and early Neolithic middens within 1 km of the Landfall site). There is potential for both palaeoenvironmental and archaeological remains to be present within this unit, however, subsequent marine transgression has eroded the upper parts of this deposit, potentially affecting preservation. The Unit may also hold evidence of the modern marine sediments represented by the SL1 member of the Surface Sands Formation. There is potential for redeposited archaeological remains in this member.

1.3.4 Maritime and coastal remains

This section considers the potential for remains relating to coastal and maritime cultural landscapes defined as evidence of '*human utilisation of maritime space by boat, settlement, fishing, hunting, shipping and its attendant subcultures, such as pilotage, lighthouse and seamark maintenance'* (Westerdahl, 1992). Remains considered therefore range from shipwrecks or other durable evidence such as cargos and ballast, to features including navigational aids, sailing marks, ports, harbours and jetties. Other coastal remains which do not necessarily relate to boat use are also considered, including fish traps and other evidence of human interaction with the sea or coast, such as coastal wartime features.

1.3.4.1 Prehistoric to Romano-British

While trade networks and maritime travel are evidenced throughout prehistory by the movement of ideas, goods and people, faunal assemblages indicate that maritime activities such as fishing were focused in coastal areas during the prehistoric and Roman periods, with limited evidence for marine exploitation from the Neolithic and throughout much of prehistory. Direct physical evidence of maritime craft dating to the prehistoric or Romano-British periods is very rare, though examples of watercraft exist from the Mesolithic period onward.

There have been no finds of maritime remains dating to the prehistoric or Romano-British periods within the Area of Project Physical Work, Eni Development Area, or wider MASA. Mesolithic and later footprints and a findspot of a Roman brooch are recorded from the wider MASA, the former in the intertidal zone at Formby, and the latter at the mouth of the River Dee, indicating general activity in these periods (further supported by the presence of major Roman centres such as at Chester, c. 30 km South-east of the MASA, and other scattered settlement on the Wirral and North Wales coast (Allen *et al.,* 2016), though given the rarity of maritime remains the potential for such remains to occur within the MASA is extremely limited.

1.3.4.2 Early Medieval to Medieval

Maritime technology and activity continued to develop in the early medieval and medieval periods. Invaders, and then settlers from Scandinavia and other areas brought new boat building technologies and opportunities for trade which led to the growth of a number of major ports around the coast of the UK (Hutchinson, 1997; Friel, 2003). In the North-west of England and North Wales activity in this period is attested to by place name evidence and historical records. A possible Norse ship has also been identified at Meols, c. 10 km east of the MASA. The results of radiocarbon dating and dendrochronology are awaited to confirm the date and origin of the vessel, however, its potential presence and the wider evidence of Scandinavian activity in the area demonstrates the potential for maritime activity in the area during this period.

During the medieval period major centres were active at Parkgate, Chester and Burton on the River Dee, and during the 13th century Liverpool, which had previously been a fishing village, developed trade routes across the Irish Sea, gradually increasing its dominance through trade, first with Ireland and later with other British colonies. More locally, the remains of the 12th-century Prestatyn Castle have been excavated c. 650 m south of the MASA, indicating medieval activity in the area.

The early medieval and medieval periods were therefore characterised by increasing maritime activity within the area of the MASA. However, while activity increased maritime finds from these periods are still rare. Additionally, no remains dating to these periods are known from within the MASA and the potential for any remains of maritime craft or coastal activity dating to these periods is considered to be limited.

1.3.4.3 Post-medieval to modern

Maritime activity increased during the post-medieval period, led by local trading ports such as Liverpool, which by the 17th century had seen vast expansion and was trading with British colonies around the world. Numerous historic trading routes, active in the post-medieval period, are thought to have crossed the Eni Development Area and Area of Project Physical Work (Alvarez-Palau and Dunn, 2019), mirrored by aids to navigation including the Point of Ayr Lighthouse (Grade II Listed), which lies within the MASA, 1 km west of the landfall site, and other navigational aids such as buoys are mapped on charts.

Potential for maritime remains therefore increases from the post-medieval period onward with the development of ports along adjacent coastlines, such as Liverpool, and increases in the number of shipping routes crossing the area. The modern period, with its increase in trade, transport and two World Wars also marks a period in which potential is increased, and the role of Liverpool in the convoy system in addition to other wartime activity increases potential in the area. In addition to these changes, developments in shipbuilding technology also occurred: vessels were increasingly constructed of iron (from the 18th century), and then steel, leaving more durable traces on the seabed which can be detected using modern survey techniques. Documentation of losses also increased, and a total of 30 records of lost vessels are recorded within the Area of Project Physical Work, Eni Development Area and MASA, with the majority (21 records) dating from the 19th century, and others dating from the 18th century (1 record) and 20th century (7 records).

The potential for remains of these periods to occur within the Area of Project Physical Work, Eni Development Area and MASA is therefore relatively high, and is borne out by some of the recorded maritime sites, discussed below.

1.3.4.4 Known and recorded maritime and coastal archaeology

Assessment of geophysical data and desk based sources has demonstrated the presence of maritime remains within the Area of Project Physical Work, Eni Development Area and MASA. The assessment has found evidence of wrecks and possible wreck sites, other maritime remains (ranging from debris, mounds potentially indicating wreck sites, remains of tower bases which are thought to represent the remains of anti-aircraft forts dumped after the Second World War, to modern infrastructure and unidentified obstructions), terrestrial and coastal features with evidence of wartime activity, navigational aids, documentary records demonstrating the loss of vessels within the area, and geological features. Of particular note, are the presence of:

- Five sites indicating wreck remains within Area of Project Physical Work.
- fifty-one sites indicating wreck remains within the Eni Development Area.
- two sites representing possible tower bases which are thought to represent the remains of anti-aircraft forts dumped after WWII within the Eni Development Area.
- thirty-one sites indicating wreck remains within the wider MASA. The latter includes the position of a Protected Wreck (the *Resurgam*), the designated circle for which extends to within the Area of Project Physical Work and Eni Development Area.
- other remains including mounds (which could indicate wreck sites), debris, fouls of unknown origin, and other unidentified obstructions are also present within the Area of Physical Project Work and Eni Development Area.
- magnetic anomalies of potential archaeological significance, including anomalies of high and medium potential (volume 3, appendix N). The origin of the anomalies is unknown, but they have potential to be of archaeological significance.

The majority of the wrecks are undated, but where dates are indicated they demonstrate a focus on 19th and 20th century craft, which is also borne out by the documented losses within the area. All maritime and coastal remains are summarised within

Table 1.1 and volume 3, appendix N.

The assessment has also found potential for other remains, including wartime coastal features and navigational aids. Pillboxes are present within the MASA around the Landfall site, though beyond both the Eni Development Area and Area of Physical Project Work. There are no known remains within the Eni Development Area and Area of Physical Project Work at the landfall site. The closest are low potential geophysical anomalies identified just offshore of the landfall location, seaward of the point where the Eni Development Area and Area of Physical Project Work widen.

The key known maritime remains are therefore those which occur below the low water mark and include the wrecks and potential wreck sites enumerated above.

1.3.5 Aviation remains

There are no known aircraft crash sites within the Area of Project Physical Work, Eni Development Area or MASA. However, the assessment has identified potential for aircraft crash sites to occur, in particular associated with the use of Talacre Warren (which lies 1.5 km to the east of the landfall site) as a WWII Spitfire training camp. This potential is further demonstrated by records of nine documented losses of aircraft within the Study Area and Eni Development Area, of which around half are Spitfires. While aircraft crashes tend to result in disarticulated remains, there is potential for remains of aircraft within the Area of Project Physical Work, Eni Development Area or Study Area. Aircraft can fall under the automatic designation of the Protection of Military Remains Act (1986) and therefore their early identification and protection is vital.

1.3.6 Historic seascape character

The assessment identified a variety of characteristics within the Eni Development Area and Area of Project Physical Work. These can be summarised as:

- Modern installations and activities such as hydrocarbon wells, pipelines, submarine cables, aggregate extraction, spoil and waste dumping.
- A range of fishing methods used in the modern period.
- Navigation routes, both modern and post medieval.
- Wrecks and maritime debris (in some cases undated).
- Seabed types and characteristics including shoals and flats and fine sediment plains.

1.3.7 Data limitations

The key limitation to the assessment is the lack of full coverage geophysical data for the area, including within the Area of Project Physical Work and Eni Development Area. Data gaps are present for example in areas where cables may require re-routing, in the intertidal zone, and in the area to the north of the *Resurgam* designated circle. The current data coverage is discussed in detail in volume 3, appendix N, and the supporting archaeological assessment of geophysical survey data (MSDS Marine, 2023). This limitation has been recognised in this assessment and fed into the recommendations for further work or mitigation.

1.4 Research agendas

The best practice guidance for Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects indicates that a WSI should *'set out the importance of research frameworks in setting objectives that are delivered through realisation of the work'.*

A number of research frameworks are of relevance to the archaeological remains and area of the Project. These include:

- People and the Sea: A Maritime Archaeological Research Agenda for England (Ransley *et al.,* 2013).
- The Research Agenda for Wales: Maritime and Coastal Archaeology (Cadw, 2004) and the draft Maritime Chapter of Archaeological Research Framework for Wales (Groom, in prep.).
- The research framework for the archaeology of Wales (IfA Wales/Cymru, 2008).
- The North West England regional research framework (Research Frameworks, 2023).

Other frameworks, including with different themes than those set out above, may also be relevant depending on the specific work package undertaken. Any archaeological activities and reporting under this WSI will tie research into the relevant research frameworks, ensuring that the project makes a contribution to archaeological knowledge focused on areas where research frameworks demonstrate a need for further understanding. The objectives of the research framework will be used to guide work and recommendations made by the Retained Archaeologist to the Applicant.

The connection with the specific work package to be undertaken, and the relevant research framework, aims and objectives, will be identified within the Method Statements which will proceed archaeological work. The Method Statement will also set out how the work undertaken will be tied into the relevant research framework during OASIS reporting (see section 1.6.1).

1.5 Impacts and mitigation

1.5.1 Overview

Impacts relevant to marine archaeology are reviewed in detail within volume 2, chapter 11, and volume 1, chapter 3 contains a full description of the proposed development Description. In summary, the proposed development will include the following construction activities:

- installation of a new Douglas CCS platform using up to eight pile driven legs.
- installation of new topsides on the Hamilton Main, Hamilton North, and Lennox wellhead platforms and associated use of jack-up barges and vessel anchoring.
- repurposing of the existing subsea natural gas pipelines.
- development of the Hamilton Main, Hamilton North and Lennox reservoirs for CO_2 storage through the drilling and re-completion of injection wells by side-tracking existing production wells. This will involve re-drilling the wells (within the existing footprints of former wells) and installing CO_2-resistant tubulars and cement.
- drilling of two new monitoring wells, one at Hamilton North (well 10 at Hamilton North, 110/13/HN_M2_1) and one at Hamilton Main (Well 9 at Hamilton North, 110/13/HM_M2_1).
- other monitoring and sentinel wells will be created through use of existing wells, with need for fibre optics to be confirmed.
- installation of new pipelines connecting the new Douglas CCS and the existing subsea natural gas pipelines. This will require insertion of a small section of pipeline, laid on the seabed, to tie the new Douglas CCS platform to the existing pipelines.
- installation of new submarine power cables connecting the Douglas Platform with the onshore terminal, and connecting the Douglas Platform with the Hamilton Main, Hamilton North and Lennox Platforms. In general these cables will follow existing pipelines at an offset of 100 m, though micrositing around heritage assets and Unexploded Ordnance (UXO) where required.
- installation of concrete mattresses and cable protection at crossings and in areas where cable burial is not possible.
- potential wet storage of cables close to platforms.

In addition to the installation of new infrastructure, or the repurposing of existing infrastructure, impacts will be felt through the anchoring or positioning of vessels or jack-ups. Additionally, an offshore accommodation flotel will be stationed adjacent to the New Douglas CCS platform during construction, commissioning and start-up activities (in the operation and maintenance phase) with associated anchoring impacts.

Sand wave clearance will also be necessary in some areas, for pipeline installation potentially in the areas south of the Douglas Platform, and West Hoyle Bank. This will be undertaken with a mass flow excavator, or a jet sled. Sand waves are approximately 2 m to 3 m in height, and a corridor approximately 10 m in width would be created through them. If the West Hoyle Bank route is not chosen the alternative route passes further east through a tidal channel. If this option is chosen some pre-lay dredging would be required to allow for a self-beaching Cable Lay Vessel (CLV) to ground itself at low tide on a ‘flat’ area of sandbank. The area to be dredged in this scenario would be approximately 180 m length, 60 m wide and 1 m to 2 m below LAT.

The landfall connection will be made using Horizontal Directional Drilling (HDD). HDD will be used to pass under the Talacre dunes and exit at the MHWS point, within the beach area.

The maximum design scenarios identified in volume 2, chapter 11 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope (PDE) provided in volume 1, chapter 3. Effects of a greater adverse

significance are not predicted to arise should any other design scenario, based on details within the PDE (e.g. different infrastructure layout), to that assessed here be taken forward in the final design scheme.

Operation and maintenance activities will take place for the 25 anticipated years of the project. The activities will include monitoring, for example for any unexpected leaks, additionally cable repair, pipeline maintenance, and associated surveys will also take place using supply and standby vessels. Well interventions will be undertaken from a jack-up barge.

Decommissioning will include removal of all installations and injection facilities, as well as other equipment, infrastructure and materials.

1.5.2 Areas of work

Two primary areas have been defined for the purposes of this application. These include:

- the Area of Project Physical Work.
- the Eni Development Area.

A third area, termed the wider MASA, will undergo no direct impacts associated with the development. The Area of Project Physical Work will be the focus for all construction activities. The installation of new wells, cables and the Douglas Platform will all be within this area, as will associated seabed preparation activities including sand wave clearance and dredging, as well as boulder clearance. Existing platforms to be repurposed also fall within this area. While the installation of new infrastructure and the conversion of existing platform infrastructure will fall within this zone, associated impacts including from jack up barges and anchoring of vessels may occur within the wider Eni Development Area. As such, taking a precautionary approach, mitigation will be applied across both of these areas, ensuring appropriate and proportionate protection for the marine historic environment.

1.5.3 Embedded mitigation and project commitments

1.5.3.1 Embedded mitigation

A series of embedded mitigation measures have been adopted as part of the project. These are summarised within volume 2, chapter 11 and below. The below list also contains reference to the relevant section of this WSI which describes details and methods relevant to each of the measures.

- implementation of Exclusion Zones:
  - the identification and implementation of AEZs around those sites identified as having high and medium archaeological potential. Final cable routing, well drilling and platform construction to avoid any known archaeological constraints identified in pre-construction site investigation surveys through micrositing. AEZs are discussed further in section 1.5.4.
  - the identification and implementation of Temporary Archaeological Exclusion Zones (TAEZs) based on all available information including the stated positional accuracy, the recorded size of the target and the potential archaeological significance around those records for wrecks, obstructions, debris and other sites of archaeological potential outside of the survey data coverage but within the Project boundary. TAEZs are discussed further in section 1.5.4.
- Archaeological input into specifications for, and archaeological analysis of, any further pre-construction geophysical (see section 1.5.13) and geotechnical surveys (see section 1.5.15).
- project archaeologists to be consulted in the preparation of any pre-construction Remotely Operated Vehicle (ROV)/diver surveys and, if appropriate, in monitoring/checking of data (see section 1.5.14).
- operational awareness of the location of those archaeological anomalies identified as having a low potential. Reporting through the agreed protocol will be undertaken should material of potential archaeological interest be encountered (see section 1.5.7, and Appendix 2).

- implementation of a protocol for recording finds of archaeological interest, following the guidance for the PAD (see section 1.5.7, and Appendix 1).
- archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction operations and, if appropriate, to carry out archaeological monitoring of such work (see section 1.5.5).
- mitigation of unavoidable direct impacts on known sites of archaeological significance: Options include i) preservation by record; ii) stabilisation; iii) detailed analysis and safeguarding of otherwise comparable sites elsewhere. Direct impacts upon archaeological sites are not planned and all known sites of potential significance are protected by AEZs and will be avoided by development impacts. Should potential for any unforeseen and unavoidable impacts be identified, a Method Statement will be produced in agreement with Archaeological Curators, detailing how these will be handled, and general archaeological practices (section 1.5.6) will be followed where preservation by record or detailed analysis of sites elsewhere is an agreed approach. Methods for any stabilisation and safeguarding will be site-specific and will be detailed within a Method Statement should the need for these interventions arise.
- commitment to implementation of the Offshore WSI (the current document) prior to any post-consent works within the Eni Development Area and Area of Physical Project Works.

1.5.3.2 Additional commitments

Archaeological assessment of full coverage data

In addition to the embedded mitigation measures, the project has committed to collection and archaeological review of full coverage geophysical survey data prior to project impacts. This will address gaps in the data (see section 1.3.7) and ensure that mitigation can be recommended for all areas where project impacts may occur, and these recommendations will be based on recent and high resolution surveys which are appropriate for archaeological assessment. Further details in relation to this commitment are set out in section 1.5.13. While recommendations for mitigation cannot be made prior to the assessment of the data, potential outcomes may be recommendations for further AEZs (see section 1.5.4.3) or for watching briefs for example within the intertidal zone (see section 1.5.5).

Publicly available data

The ES also made a commitment to enhance understanding of the historic environment (through assessment of geophysical and geotechnical data), and to make this data publicly available (see Table 11.1 within volume 2, chapter 11). This commitment will be secured through reporting, publication and use of OASIS V (see section 1.6).

1.5.4 Exclusion zones

1.5.4.1 Archaeological exclusion zones

Best practice favours the preservation *in situ* of archaeological remains, therefore the ideal preferred mitigation for archaeological remains is avoidance (COWRIE, 2007). For the Project, AEZs have been proposed that prohibit development-related activities within their extents, which vary depending upon the nature of the site. All AEZs agreed with the archaeological curators, through this Offshore WSI, will be marked on the Design Plan. If impacts cannot be avoided, measures to reduce, remedy or offset disturbance will be agreed.

In view of their potential archaeological significance, AEZs (either in the form of individual AEZs or clusters) will be placed around the nine locations which include the Protected Wreck of the *Resurgam*, and Scheduled wreck of the *Lelia*, both of which have statutory designated areas, included here as AEZs. The others represent high and medium potential anomalies identified by the geophysical data assessment. These anomalies have been recommended AEZs based on the size of the anomaly, the extents of any debris, the potential

significance of the anomaly, the potential impact of the development and the seabed dynamics within the area. Dependant of the form of the anomaly, AEZs have either been recommended as a radius from the centre point of the anomaly or as a distance from the extents. Particularly in the case of shipwrecks, which tend to be longer in length than width, the use of a circle provides unequal protection around the extents. This not only impacts the protection afforded but does not present proportional mitigation. The proposed AEZs are listed in Table 1.2 and shown in Figure 1.3 to Figure1.5. All positions are given in the European Datum 1950 (ED50) and Universal Transverse Mercator (UTM) Zone 30 North projection (ED50 Z30N).

The designated wreck of the *Resurgam* and the statutory protected area (Statutory Instrument 1996 No. 1741), have been included within this section. Whilst the wreck lies outside of the Eni Development Area and the Area of Project Physical Work the statutory protected area extends into these areas. To note, the designated area is not centred on the location of the wreck as provided by UKHO (detailed in Table 1.2), the location of the designated area is presented in Figure 1.3 (note that cables routed through the protected area are already in existence, pre-dating the designation of the wreck. Proposed cables avoid the designated area). Likewise, the scheduled wreck of the *Lelia* has also been included. Both the wreck and the designated circle lie within the Study Area, but due to proximity to the Eni Development Area the site has been included here to ensure awareness.

Table 1.2: Archaeological Exclusion Zones

MSDS_ID	Geophysical ID	Description	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	AEZ (m)	Type
E_001		*Resurgam*. Protected Wreck. Submarine	463157.66	5916617.67	300	Radius (not centred)
E_002		*Lelia.* Scheduled. Paddle Steamer	474625.65	5926786.95	50	Radius
E_005	CCS23_052	Wreck	475696.8	5914362.7	75	Extents
E_006	CCS23_020	Potential wreck	461786.6	5933019.5	75	Extents
E_010	CCS23_054	Mound	472907.1	5915455.1	25	Extents
E_095	CCS23_092	Debris	461580.3	5928986.4	25	Extents
E_096	CCS23_094	Debris	476748.4	5914455.3	15	Radius
E_097	CCS23_095	Debris	476667.2	5914598.3	15	Radius
E_098	CCS23_104	Debris	476023.9	5937756.2	50	Extents

The final development layout will take into account these preliminary zones, which may evolve or be removed (with the agreement of Cadw and HE) as the Project progresses, subject to layout designs and additional subsequent surveys that may be required. Scope is allowed for their amendment in light of further evidence and with the involvement of consultees. Currently, planned cable routes bisect a number of AEZs. This issue has been discussed with the RCAHMW during the pre-application period, and a solution developed. This solution involves options to investigate AEZs further and refine the extents of AEZs where appropriate; and/or to re-route around these AEZs and to collect and assess data from the wider area to do so (ensuring that impacts do not take place before archaeological assessment of full-coverage geophysical data has been conducted, including on any deviations to the cable routes necessary to avoid AEZs). This work will take place prior to any seabed impacts in the area, and there will be no impacts to finalised AEZs during construction, operation, maintenance and decommissioning activities. The options and workflows for ensuring there are no impacts to AEZs are set out within Table 1.3, and further survey work is discussed further in section 1.5.13.

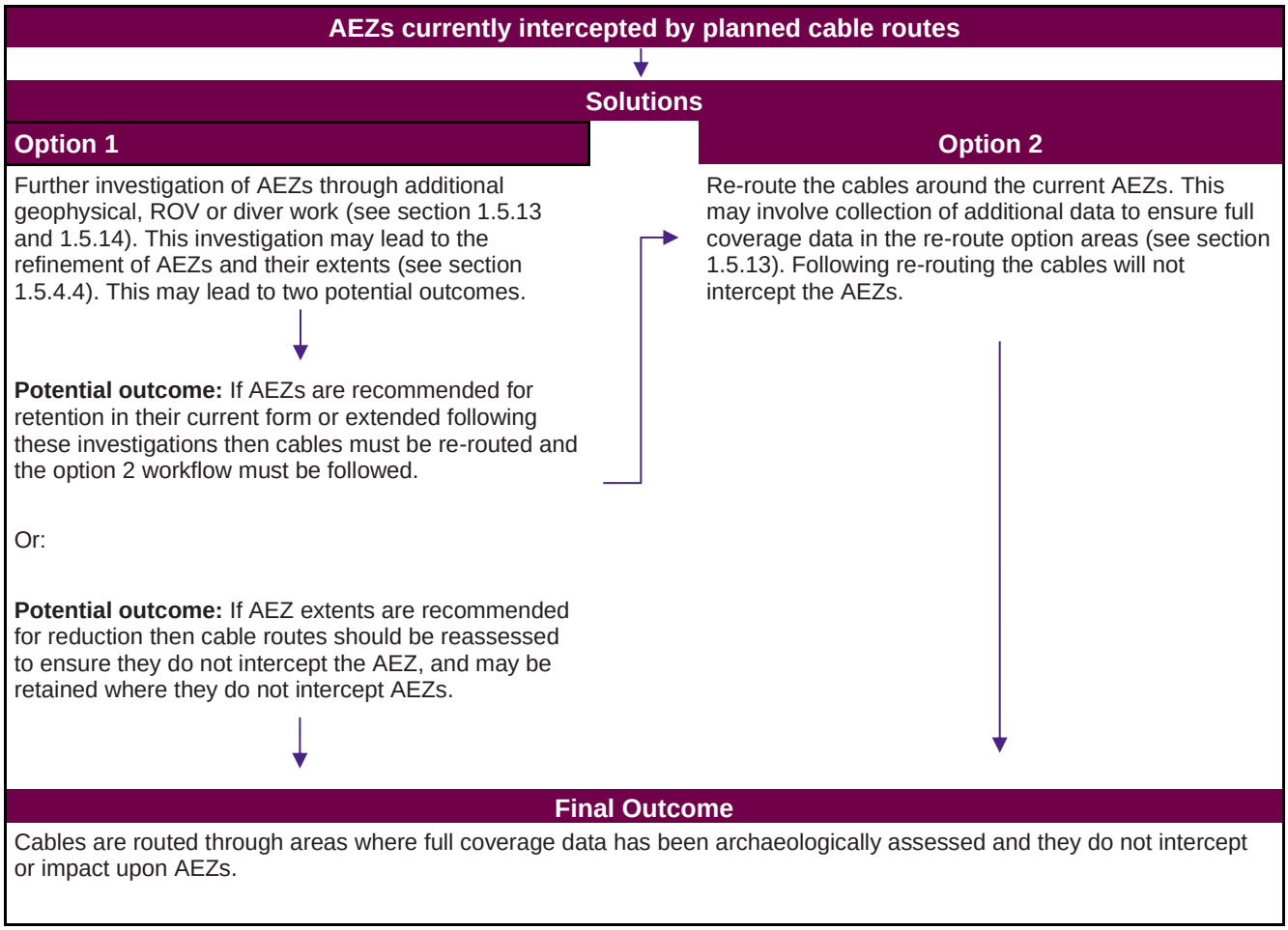

Figure 1.2: Workflow For Ensuring There Are No Development-Related Impacts Within AEZs

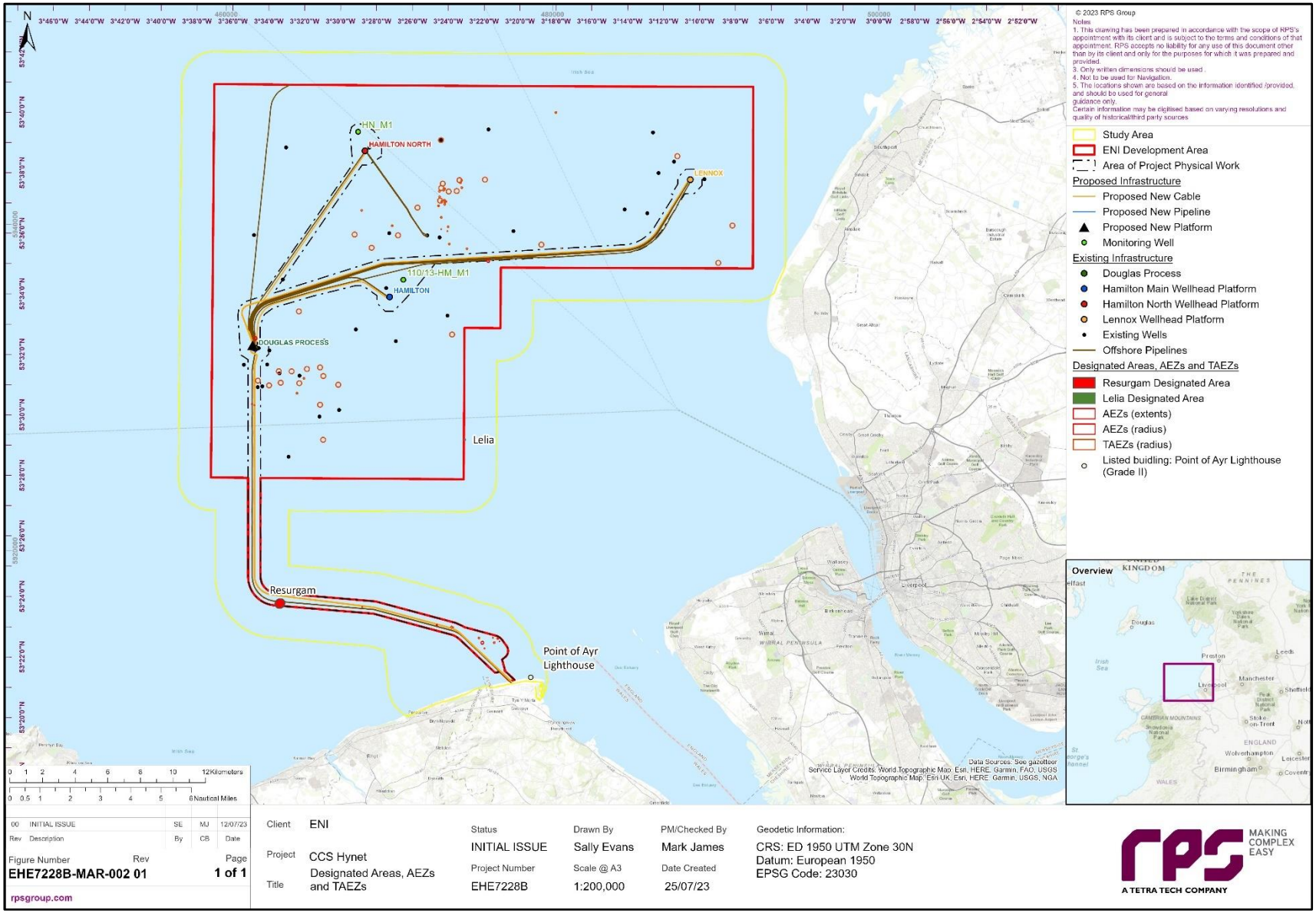

Figure 1.3: Distribution Of Designated Areas, AEZs, TAEZs

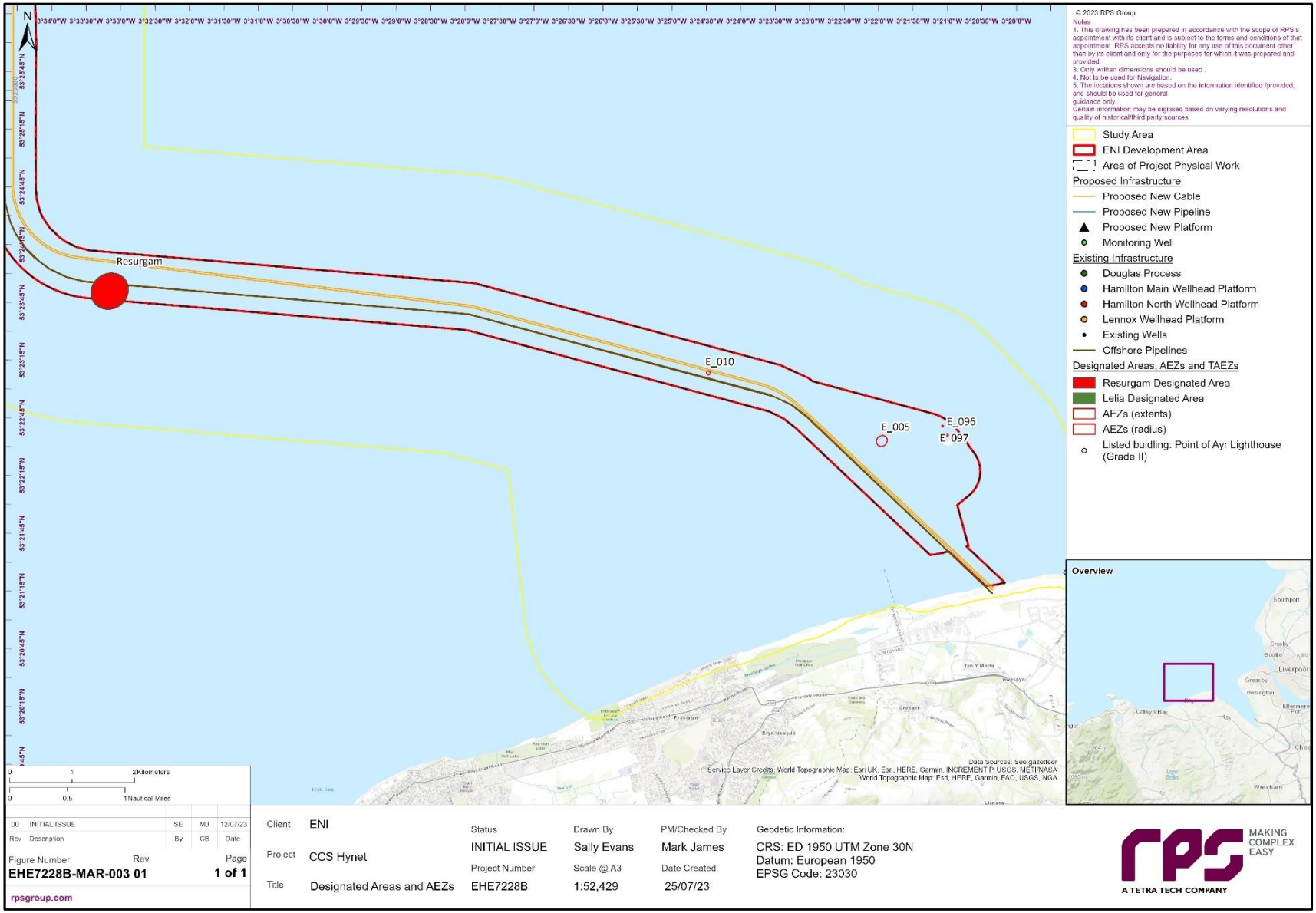

Figure 1.4: Distribution Of Designated Areas And AEZs (South)

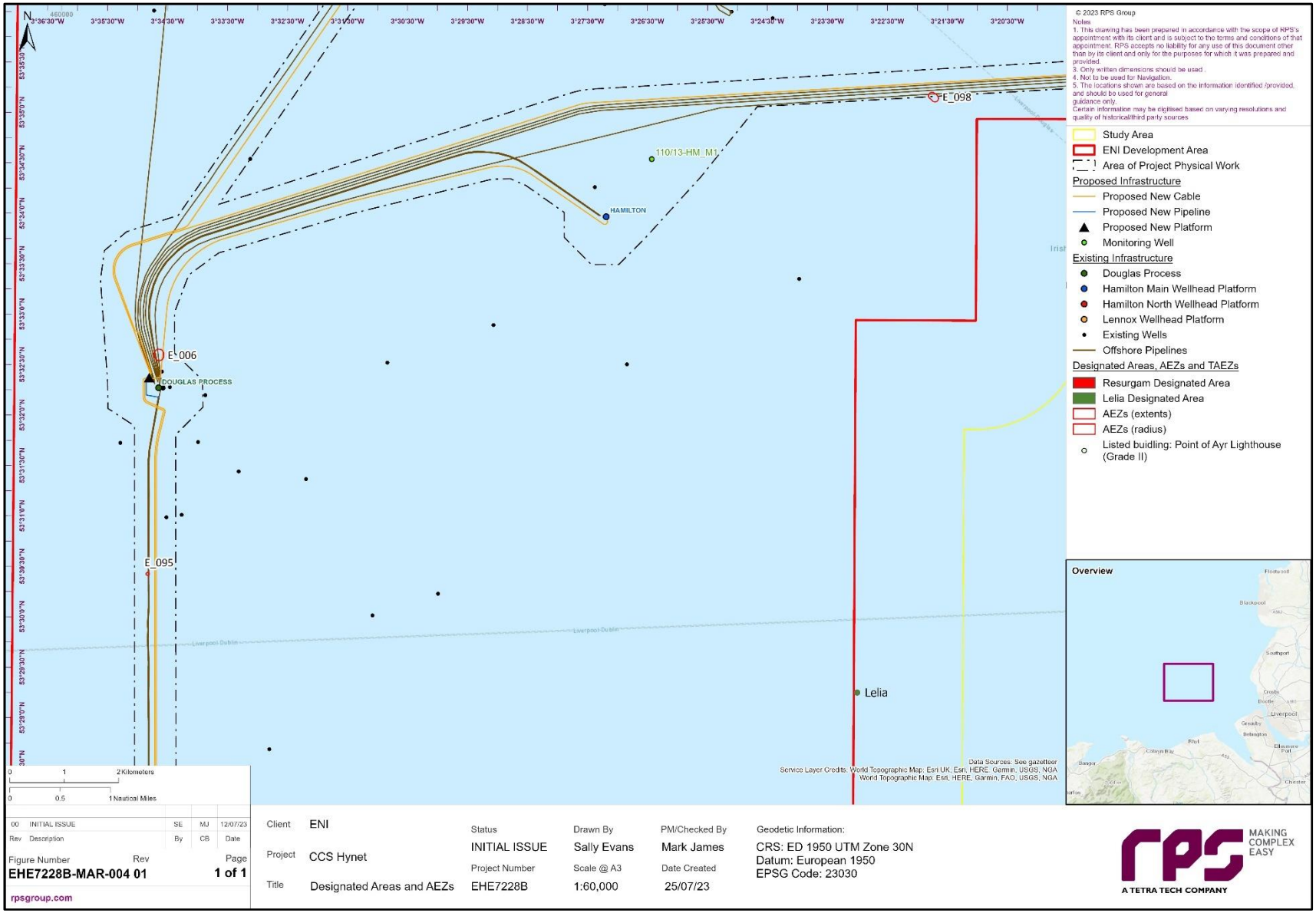

Figure1.5: Distribution Of Designated Areas And AEZs (North)

1.5.4.2 Temporary archaeological exclusion zones

Sixty-seven TAEZs have been recommended within the Eni Development Area and Area of Physical Project Work. TAEZs are recommended where an anomaly is not visible in the geophysical dataset but is known to exist based on information from other datasets (e.g. UKHO data), where the position cannot be determined with enough accuracy for refined exclusion zones, or where the extents are not fully known. They are often larger than AEZs but are identified as temporary as they are highly likely to be altered following higher resolution or full coverage data assessment, or investigation with an ROV, however, they will remain in place until alterations have been formally agreed.

TAEZs have been assigned where remains are thought to be of medium, high or uncertain archaeological potential. All wreck remains which lie within the Area of Physical Project Work and Eni Development Area, listed in Table 1.1 have been recommended either AEZs or TAEZs. Other maritime remains including wreck sites or potential wreck sites, wreckage, the two potential WWII anti-aircraft towers, and unidentified fouls, obstructions, debris and magnetic anomalies have been recommended for TAEZs where they are considered to be of potential high or medium archaeological significance or where the significance is as yet unknown. Those remains which have not been recommended for protection by a TAEZ have been excluded following assessment which has determined their low archaeological potential. This is the case for maritime remains including chain cable or rope, collapsed oil platforms, likely infrastructure, fishing gear, concrete mattresses and other similar remains. Other remains which have not been recommended for protection by a TAEZ have been excluded where assessment has determined an unlikelihood of remains being present at the given location (e.g. fisherman's fastenings and unidentified obstructions connected with records of fisherman's fastenings, unidentified non-submarine contacts, and spoil ground, the extents of which are unknown). All terrestrial assets (see summary in

Table 1.1) lie beyond the Area of Physical Project Work and Eni Development Area, and are therefore not recommended AEZs. Likewise documentary records are not recommended for TAEZs due to the low likelihood of physical remains at the given locations. In summary, the assessment has determined the following groupings of remains, and has made the following recommendations:

Remains identified as of high archaeological potential, which have been recommended TAEZs:

- wrecks, wreckage and wreck remains.

Remains identified as of medium archaeological potential within the geophysical assessment, which have been recommended TAEZs:

- debris,
- mounds,
- two potential WWII anti-aircraft towers.

Unidentified remains with uncertain archaeological interest, which have been recommended TAEZs. These include:

- fouls,
- obstructions, and
- magnetic anomalies of high and medium archaeological potential.

Remains identified as of low archaeological potential within the geophysical assessment or by the desk-based assessment which have not been recommended AEZs/TAEZs:

- debris and potential debris.
- beacons (discarded navigation beacons).
- geophysical anomalies (debris and origin unknown).
- unknown anomalies.

- seabed disturbance.
- linear features.

Modern elements with no archaeological interest which have not been recommended AEZs/TAEZs. These include:

- anchor, chain and cable and chain, cable or rope.
- collapsed platforms.
- platforms.
- possible oil rig leg.
- debris (likely infrastructure).
- fishing gear.
- concrete mattresses.

Remains where the extents or positions are unknown or questionable which have not been recommended AEZs/TAEZs:

- unidentified obstructions and fisherman's fasteners.
- obstruction: Non-submarine Contact (NSC).
- spoil ground.

The size of the TAEZs takes into consideration the proximity of available survey data, the potential to represent material of archaeological significance, the perceived accuracy of the position, and other anomalies that may be present within the surrounding area. Anomalies and their recommended exclusion zones are detailed in

Table 1.3 and the distribution presented in Figure 1.3, with detailed distributions in Figure 1.6 to Figure 1.10.

Table 1.3: Temporary Archaeological Exclusion Zones

MSDS TR ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	AEZ (m)	AEZ Type
E_013		Wreck	461936.409	5930419.47	150	Radius
E_016		Wreck	465945.894	5930704.11	150	Radius
E_017		Wreck	464004.008	5930992.88	150	Radius
E_018		Wreck	462622.612	5930132.13	150	Radius
E_019		Wreck	464944.288	5931135.99	150	Radius
E_020		Wreck	465748.985	5928944.17	150	Radius
E_021		Wreck	463219.551	5931000.8	150	Radius
E_022		Wreck	463335.604	5930295.26	150	Radius
E_023		Wreck	464473.676	5930268	150	Radius
E_025		Wreck	479313.151	5938753.4	150	Radius
E_026		Wreck	475854.121	5942736.87	150	Radius
E_027		Wreck	471718.371	5941023.76	150	Radius
E_030		Wreck	466862.893	5930172.27	150	Radius
E_031		Wreck	464452.733	5934664.68	150	Radius
E_032		Wreck	474292.184	5942705.61	150	Radius
E_033		Wreck	473631.371	5942010.22	150	Radius

MSDS TR ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	AEZ (m)	AEZ Type
E_034		Wreck	473171.832	5942226.08	150	Radius
E_035		Wreck	473101.251	5941451.39	150	Radius
E_036		Wreck	473268.123	5942491.94	150	Radius
E_037		Wreck	467864.906	5939373.83	150	Radius
E_038		Wreck	468907.256	5938563.4	150	Radius
E_040		Wreck	470529.796	5939325.49	150	Radius
E_043		Wreck	487647.245	5944174.28	150	Radius
E_044		Wreck	491021.934	5939923.43	150	Radius
E_045		Wreck	465747.155	5931230.86	150	Radius
E_048		Wreck	474120.979	5942040.87	150	Radius
E_052		Wreck	490156.377	5937636.74	150	Radius
E_054		Wreck	465936.149	5926795.95	50	Radius
E_058		Wreck	473841.365	5933249.41	150	Radius
E_059		Wreck	473159.973	5945159.62	150	Radius
E_060		Wreck (probable)	464763.209	5930562.51	50	Radius
E_061		Wreck or ballast mound	480201.187	5946851.51	50	Radius
E_062		Wreck or debris	464336.382	5929649.71	50	Radius
E_063		Wreck or debris	473072.826	5941685.19	50	Radius
E_065		Wreck or beacon	473179.159	5940423.67	50	Radius
E_066		Wreck or beacon	473009.024	5941134.83	50	Radius
E_070		Possible wreck	475487.923	5914655.71	50	Radius
E_071		Possible wreck	476423.397	5914374.67	50	Radius
E_077		Wreck or wreckage (possible)	473394.939	5941332.89	50	Radius
E_078		Wreckage	473064.822	5942019.01	50	Radius
E_079		Wreckage	473389.805	5942176.62	50	Radius
E_080		Wreckage	473345.743	5942182.43	50	Radius
E_081		Wreckage	470165.918	5939914.9	50	Radius
E_082		Wreckage	473371.504	5941477.66	50	Radius
E_083		Wreckage	473320.944	5942089.94	50	Radius
E_084		Wreckage	474352.147	5942547.71	50	Radius
E_085		Wreckage	473458.147	5941397.43	50	Radius
E_086		Wreckage	473598.255	5939846.47	50	Radius
E_087		Wreckage	474751.24	5938506.9	50	Radius
E_088		Wreckage	474431.873	5942248.7	50	Radius
E_089		Wreckage	473195.497	5941352.57	50	Radius
E_090		Wreckage	473230.141	5941433.96	50	Radius
E_091		Possible wreckage	473391.011	5941223.52	50	Radius
E_093		Debris	473446.026	5941399.36	50	Radius
E_094		Debris	474424.38	5942693.77	50	Radius
E_179		Tower	468297.634	5940854.15	50	Radius
E_180		Tower	473671.771	5938796.54	50	Radius

MSDS TR ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	AEZ (m)	AEZ Type
E_188		Obstruction	480525.477	5938531.93	25	Radius
E_194		Foul	473550.442	5939581.58	25	Radius
E_195		Foul	473170.608	5939698.7	25	Radius
E_421	CCS23_M206	Magnetic anomaly	475824.1	5914015.1	25	Radius
E_422	CCS23_M220	Magnetic anomaly	473906.2	5915305.7	25	Radius
E_423	CCS23_M221	Magnetic anomaly	468331.6	5916557.8	25	Radius
E_424	CCS23_M235/237	Magnetic anomaly	473810.2	5915328.8	50	Radius
E_425	CCS23_M268	Magnetic anomaly	461729.3	5928916.4	25	Radius
E_426	CCS23_M199	Magnetic anomaly	476341.72	5914668.39	25	Radius
E_427	CCS23_M215	Magnetic anomaly	476634.56	5914622.8	50	Radius

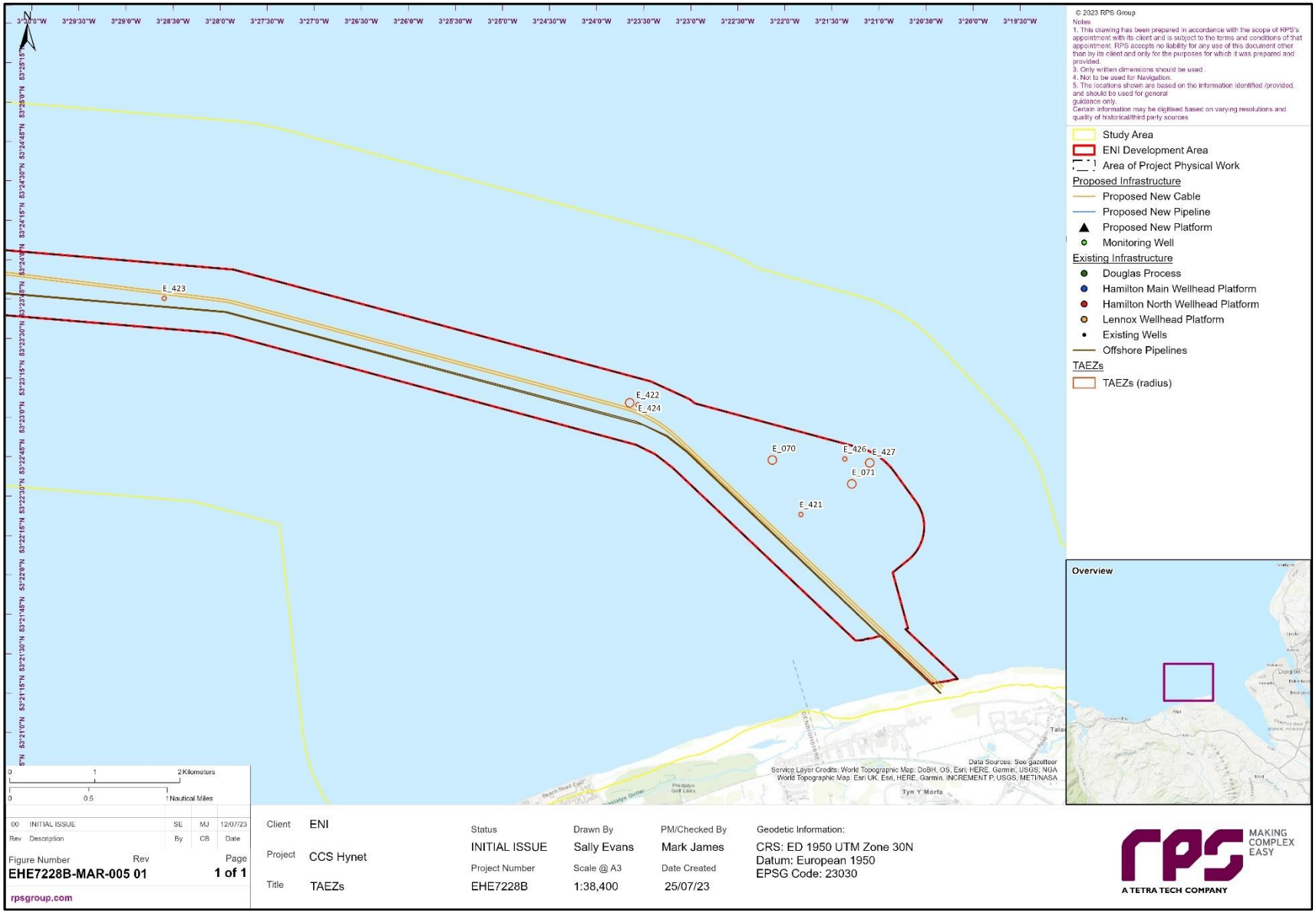

Figure 1.6: Distribution Of TAEZs (Southern Cable Route And Landfall)

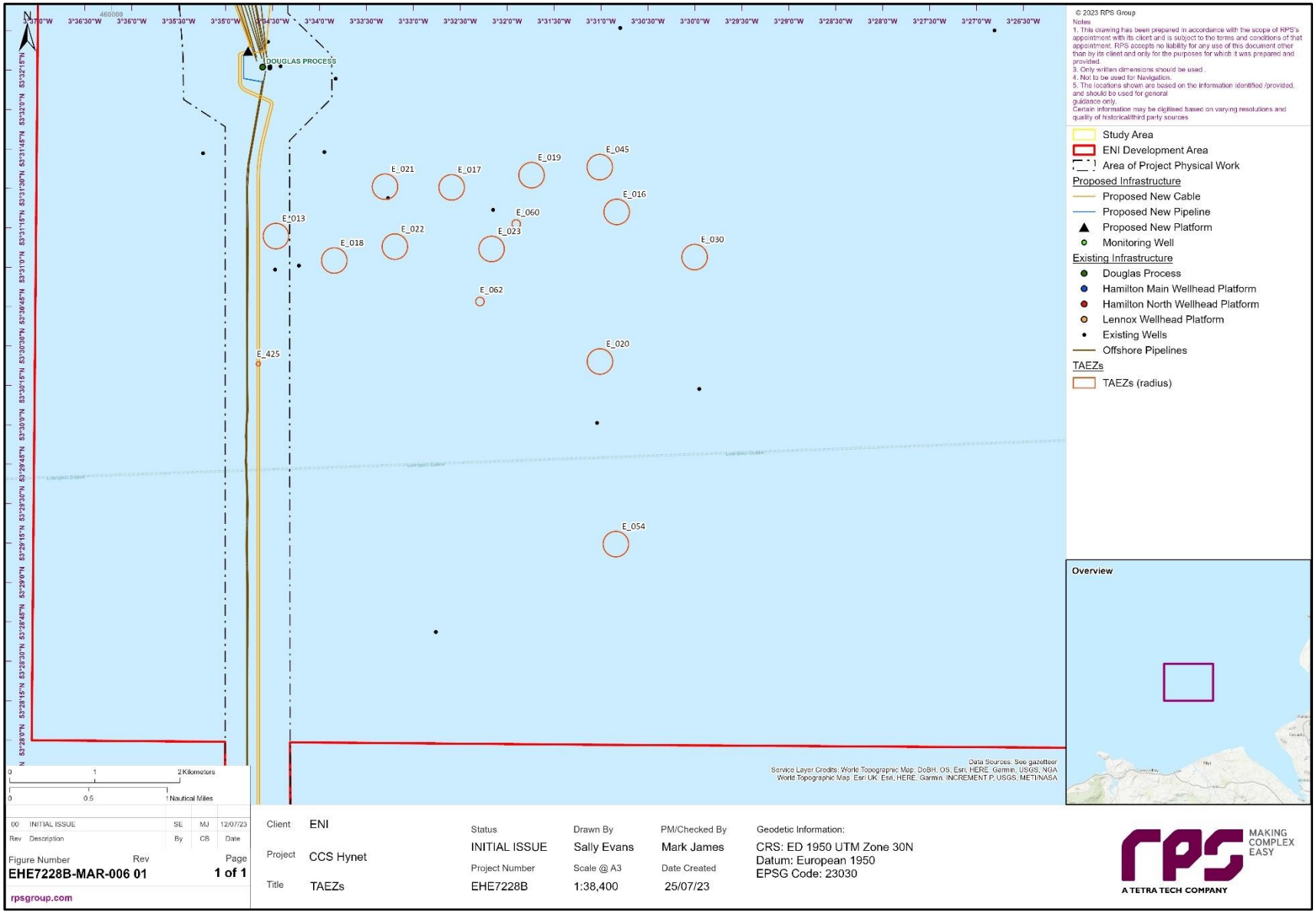

Figure 1.7: Distribution Of TAEZs (South Of Douglas Platform)

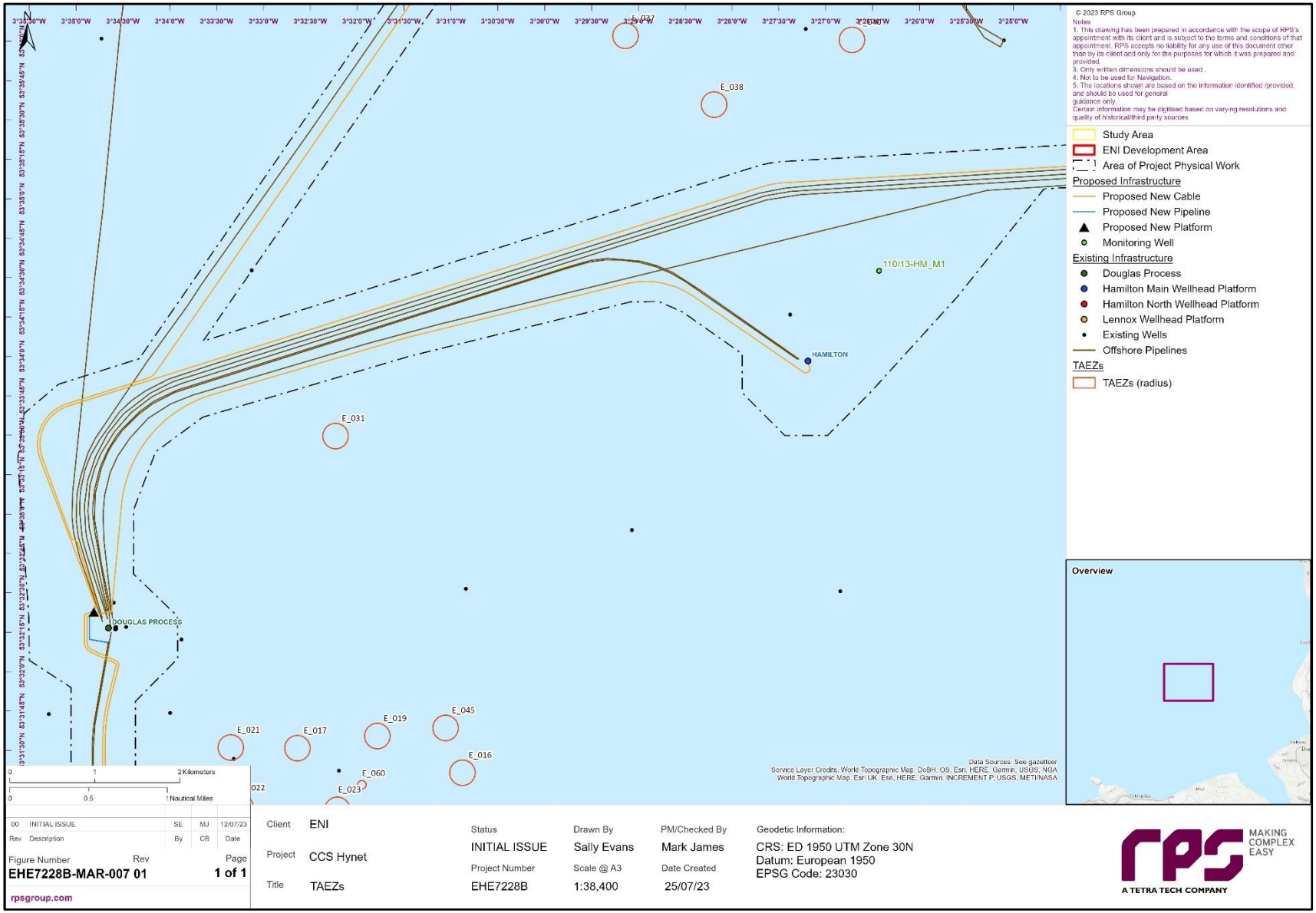

Figure 1.8: Distribution Of TAEZs (North Of Douglas Platform)

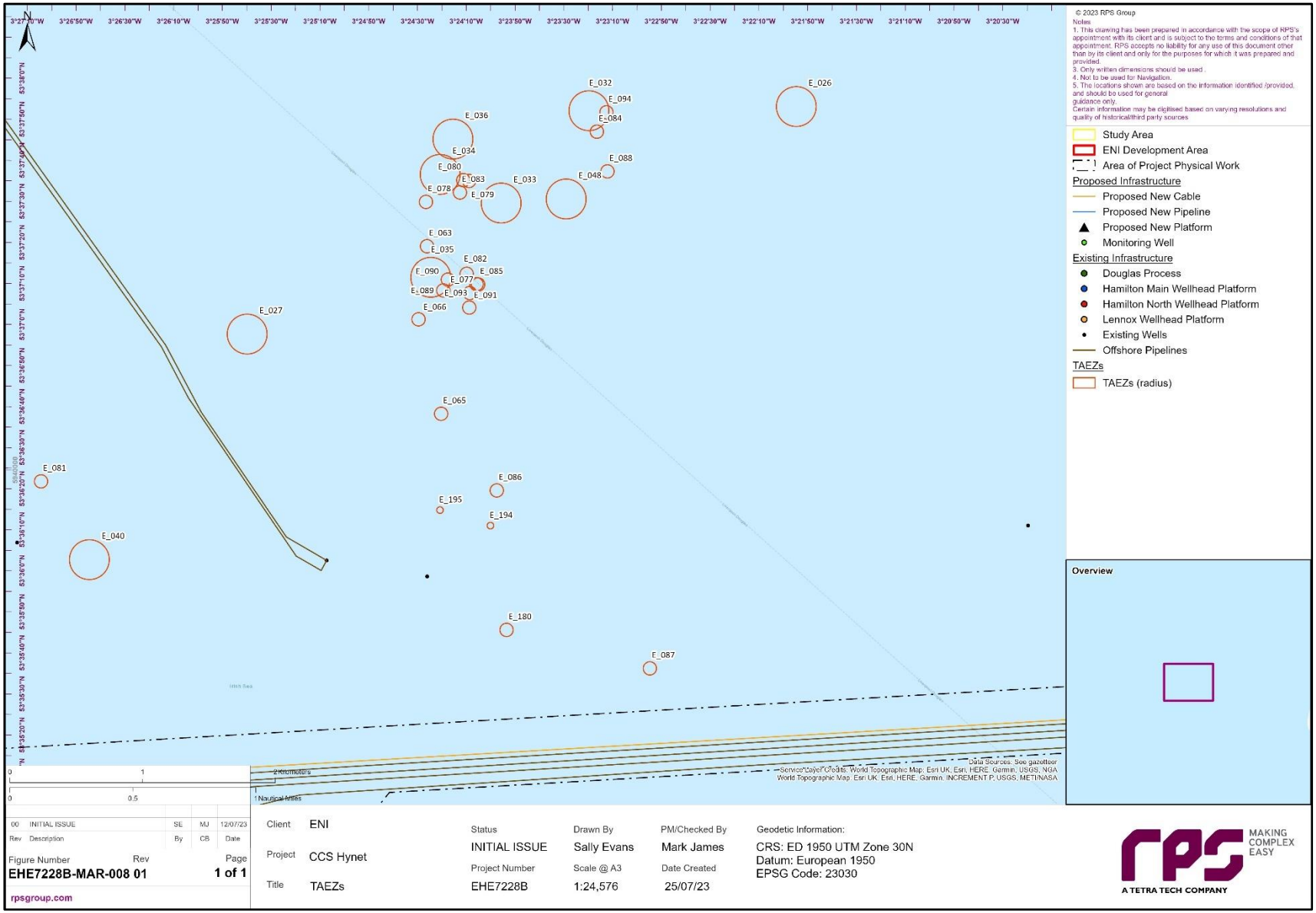

Figure 1.9: Distribution Of TAEZs (Between Hamilton Platforms)

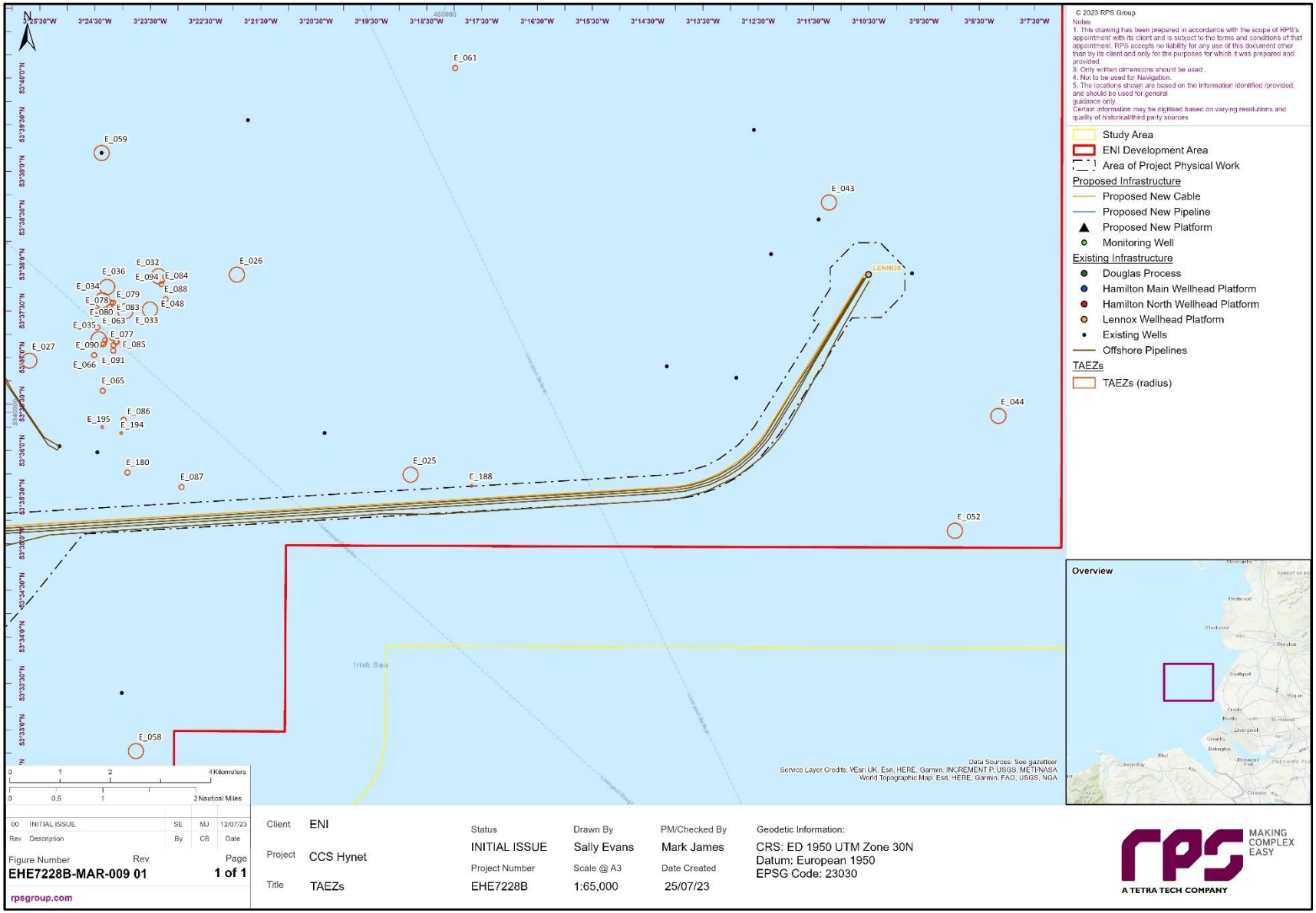

Figure 1.10: Distribution of TAEZs (Eastern Area To Lennox Platform)

1.5.4.3 Establishing new archaeological exclusion zones

If new finds of archaeological importance are made during the course of construction (or any subsequent stage of the Project) they may be subject to the implementation of additional AEZs. Establishment of new AEZs may for example occur where full coverage data of the area is collected and archaeologically reviewed, or where activities such as ROV UXO investigations identify additional features.

All finds of archaeological material will be reported to the Retained Archaeologist/Nominated Contact by the Construction Contractor(s), in accordance with the PAD (see Section 1.5.7 below and Appendix 1). The Retained Archaeologist will inform the Archaeological Curator and the Applicant of all reports.

All activities that may affect the seabed in the vicinity of any find will cease until archaeological advice has been sought and received and, if necessary, an archaeological inspection of the material and site has taken place.

The Archaeological Curator will be consulted by the Retained Archaeologist on the need for, and the design (position, extent) and implementation of any new AEZs.

1.5.4.4 Altering archaeological exclusion zones

AEZs may be altered (enlarged, reduced, moved or removed) as a result of the results of future geophysical or ROV surveys and/or archaeological field evaluation. Archaeological field evaluation may include suitable high-resolution marine geophysical survey, and/or survey by diver or ROV.

The alteration of AEZs will only be undertaken following consultation with the Archaeological Curator. Following alteration, a new plan giving details of the revised AEZs will be drawn up for the Applicant by the Retained Archaeologist and issued by the Applicant to its Construction Contractor(s) and onboard vessel representatives.

1.5.4.5 Monitoring archaeological exclusion zones

The effectiveness of the AEZs and TAEZs (for details see Table 1.2 and Table 1.3) will be monitored by regular review by the Retained Archaeologist of vessel track plots and anchor spots supplied by the Applicant. This data will be reviewed monthly by the retained archaeologist, at a minimum.

Should a breach of an AEZ be suspected this will be resolved by further investigation, which may include carrying out a geophysical or diver/ROV survey of the area thought to be affected.

On completion of the construction phase, the Retained Archaeologist will compile a report on the effectiveness of the AEZs, any alterations to them, and the results of monitoring.

1.5.5 Archaeological monitoring

The Marine Archaeology ES chapter (volume 2, chapter 11), sets out the following commitment in regard to monitoring:

Archaeologists are to be consulted in the preparation of pre-construction cable route clearance or other pre-construction operations and, if appropriate, to carry out archaeological monitoring of such work.

The following section sets out methods for monitoring, should this be required.

1.5.5.1 Marine watching brief

The proposed mitigation strategy, which is based on the current understanding of archaeological remains and construction techniques, does not require a marine watching brief. Should future work lead to the identification of further archaeological remains, or should the construction methods or locations be altered, a marine watching brief may be required.

If a marine watching brief is required, it would be conducted by a suitably qualified and experienced marine archaeologist, in line with the CifA Standards and Guidance for Archaeological Watching Briefs (CifA, 2014a). A detailed method statement would also be produced and approved by the Archaeological Curators before any watching brief activities are undertaken.

1.5.5.2 Watching brief methods

Following the review of geophysical survey data covering the area from below the HDD exit pits to the area below low water (which currently forms a data gap) by the Retained Archaeologist or Archaeological Contractor, recommendations as to the need for an intertidal watching brief or other mitigation will be made. These recommendations will be agreed with the Archaeological Curators.

Where archaeological watching briefs are necessary a detailed method statement for the proposed works will be produced and agreed with curators prior to any watching brief activities taking place. All watching briefs will be conducted in line CifA Standards and Guidance for Archaeological Watching Briefs (CifA, 2014).

Excavated surfaces and up-cast material will be inspected by the Archaeological Contractor. Any standing section of trench edge will be inspected by the Archaeological Contractor, where safe to do so.

Archaeological features or structures will be examined and/or excavated. A sufficient sample of each layer/feature type will be investigated in order to elucidate the date, character, relationships and function of the feature/structure. Development activities will include provision for sampling of features and deposits in order to recover artefacts, ecofacts and dating evidence, and in order to determine stratigraphic relationships. Recording will include written, drawn, and photographic elements as conditions allow.

Where appropriate, sieving of bulk environmental samples will be undertaken to enhance levels of artefact recovery. Bulk soil samples may be taken specifically for artefact recovery. Any finds will be collected and allocated a record number and their position will be logged.

Suitable time will be allowed, and resources made available within the construction programme for each such intervention.

If significant archaeological or palaeoenvironmental deposits are encountered then the Applicant, in consultation with the relevant Curator, will make provision for the Archaeological Contractor to undertake a programme of investigation commensurate with the evidence discovered.

Recording and reporting

A site plan at an appropriate scale will be annotated with the position of areas observed in relation to the construction footprint and provided to the relevant Contractors. The plan will show the location of features observed and recorded during the investigations. The site plan should include a note of the position-fixing method and the accuracy achieved.

The basic record of each feature/structure identified during the watching brief should include:

A full photographic record;

- Drawn record (plans and sections);
- Position in three dimensions; and
- A written description including initial interpretation and contextual relationships.

Positions will be related to National Grid and Ordnance Datum (landward of the Mean Low Water Mark (MLWM)) or ED50 UTM Zone 30N for the offshore elements of the scheme.

The archaeological results will be compiled in a report by the Archaeological Contractor, in accordance with the requirements outlined in Standard and Guidance for archaeological watching briefs (CIfA, 2014a), and in accordance with reporting procedures set out in Section 1.6.2.

1.5.6 General archaeological practices

During seabed preparation, construction and future activities associated with the Project, archaeological finds and deposits may be encountered, and records may need to be produced. This situation may arise under a number of different circumstances, for example during watching brief activities. However, where it does arise the following general methods will be employed.

1.5.6.1 Survey and recording

All finds and seabed archaeological deposits will be recorded using a pro forma recording system, and a running matrix of assigned contexts will be maintained for each site.

A full photographic record will be maintained using video and digital stills photography. The photographic record will illustrate both the detail and the general context of the principal features, finds excavated, and the site as a whole.

1.5.6.2 Positioning

Surveys should be carried out to a single datum and coordinate system, preferably the ED50 UTM Zone 30N for the offshore elements of the scheme.

1.5.6.3 Finds and conservation

Objects relating to human exploitation of the area that may be identified during the Project will be recovered by the Archaeological Contractor or, where recovery is impracticable, recorded. All finds will be recorded by context and significant objects (‘special finds’) in three dimensions using a sequence of unique numbers.

Finds and other items of archaeological interest recovered offshore during investigation are the property of the Crown Estate as the landowner, with the exception of all human remains, items that are ‘treasure’ for the purposes of the Treasure Act 1996 (relevant in the intertidal zone) and ‘wreck’ for the purposes of the Merchant Shipping Act 1995. The Applicant will seek permission from the landowner to donate finds to an appropriate Museums Service prior to depositing the archive.

In the event of the discovery of items that fall under the Treasure Act 1996 (as amended), the Contractor will immediately notify the Retained Archaeologist, who will notify the District Coroner within 14 days. The Applicant and the Archaeological Curator will be notified as soon as possible. Items falling under the Treasure Act (as amended) will be removed from the site by the Archaeological Contractor and stored in a secure location, pending a decision by the Coroner.

Subject to these legal requirements and to the agreement reached with the Museum regarding selection, retention and disposal of material, the Archaeological Contractor will retain all recovered objects unless they are undoubtedly of modern or recent origin. The presence of modern objects will, however, be noted on context records. In these circumstances, sufficient material will be retained to elucidate the date and function of the deposit from which it was recovered.

Any finds and environmental samples will be processed according to professional standards for finds analysis, environmental sampling and archive preparation, and in accordance with the Chartered Institute of Archaeologists' Standard and Guidance for the collection, documentation, conservation and research of archaeological materials (CIfA, 2014b).

Finds will be primarily conserved, bagged and boxed in accordance with guidelines set out in the United Kingdom’s Institute for Conservation’s Conservation Guidelines No 2 (ICON, 1984). In consultation with the Applicant and the Archaeological Curator, the Retained Archaeologist will advise on the implementation of passive conservation for smaller objects pending more detailed conservation strategies. The Applicant will also make provision for a professional conservator to undertake a conservation assessment of assemblages, including recommendations and timescales for the conservation of the object.

Specialist work approved by the Applicant and the Archaeological Curator on metalwork, bone (including worked bone, human remains and other organic remains), industrial waste, ceramic material, glass and lithic material will be carried out by suitable Archaeological Contractors, monitored by the Retained Archaeologist.

In the event of the discovery of unexpected, unusual or extremely fragile and delicate objects and deposits, such as waterlogged wood, the Retained Archaeologist, the Applicant and the Archaeological Curator will be notified immediately. Additional work required to recover, record, analyse, conserve and archive such objects and deposits will be agreed with the Archaeological Curator.

1.5.6.4 Human remains

In the event of the discovery of any confirmed human remains, the Construction Contractor or Archaeological Contractor will immediately inform the Retained Archaeologist. The Retained Archaeologist will inform the Applicant, the Archaeological Curator, and where appropriate the Coroner and the Police.

It is proposed that any such remains will be left *in situ* until the Applicant, the Coroner and the Archaeological Curator have been informed. Where development will unavoidably disturb them, they will be fully recorded, excavated, and removed from the site subject to compliance with the relevant Ministry of Justice Licence for such activities which will be obtained by the Retained Archaeologist.

The final placing of human remains following analysis will be subject to the requirements of the Ministry of Justice Licence.

1.5.7 Protocol for reporting finds of archaeological interest

A protocol for reporting finds of archaeological interest will be implemented during all activities relating to construction, operation, maintenance and decommissioning. It will address the reporting of unexpected finds of archaeological material, recovered from the sea during these activities.

The protocol will largely follow the format laid down in the document PAD: Offshore Renewables Projects (The Crown Estate, 2014). The Retained Archaeologist will operate to administer the PAD and provide initial advice to the Applicant and will liaise with the Archaeological Curators as necessary. The details of the PAD, including key roles and communication steps are set out in Appendix 1.

Once agreed by the Applicant and the Archaeological Curator, the PAD will be distributed in a form suitable for use on board construction vessels. The Applicant will ensure that the relevant staff on all construction vessels are informed of and have access to the PAD, including supporting material, detailing the find types that may be of archaeological interest, and the potential importance of any archaeological material encountered.

All finds of archaeological material will be reported by the Construction Contractor(s), to the Retained Archaeologist/Nominated Contact who will inform the Applicant and then the Archaeological Curator. If the find is ‘wreck’ within the meaning of the Merchant Shipping Act 1995 then Retained Archaeologist/Nominated Contact will also make a report to the Receiver of Wreck. Full contact details for all relevant parties will be included in the PAD.

The response to reported finds will be implemented through the measures set out in the PAD, including further surveys or establishment of new AEZs if appropriate.

The PAD will be implemented by means of toolbox talks presented to the relevant vessel crews to ensure that all staff are made aware of what constitutes an appropriate find. The frequency and timing of these toolbox talks is determined in relation to ongoing activities. The PAD will be supported by a package of awareness training for the Applicant and its contractors’ and sub-contractor’s staff.

At the end of the construction phase, the Retained Archaeologist will prepare a report on the results of the PAD. The results will be included in the final archaeological report in the section covering maritime sites and finds within the area affected by the development.

1.5.8 Crashed aircraft procedures

The ES and Technical Report identified potential for remains of crashed aircraft to occur within the Eni Development Area and Area of Project Physical Work. This section sets out the specific procedures to be followed in the event that remains of an aircraft are identified.

The majority of aircraft wrecks are military and so fall under the legal protection of the Protection of Military Remains Act 1986. Archaeological Contractors should refer to guidance outlined in Collaborative Offshore Wind Research into the Environment (COWRIE) Historic Environment Guidance (Wessex Archaeology, 2007), Draft Interim Guidance on the use of the Protocol for Reporting Finds of Archaeological Interest in relation to Aircraft Crash Sites at Sea (Wessex Archaeology, 2008) and Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (English Heritage, 2002).

Any finds that are suspected of being military aircraft will be reported immediately to the Retained Archaeologist. The Applicant will be informed as well as the Service Personnel and Veterans Agency (SPVA: Joint Casualty and Compassionate Centre (JCCC) - SO3 Historic Casualty Casework). The Retained Archaeologist should seek specialist advice for the identification of aircraft remains where necessary.

Any subsequent actions will be guided by Crashed Military Aircraft of Historical Interest: Licensing of Excavations in the UK – Guidance Notes for Recovery Groups (MOD and SPVA, 2007) and by advice received from SPVA. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately in accordance with paragraph 14 of Guidance Notes for Recovery Groups.Methods for Archaeological Involvement in Further Work

1.5.9 Archaeological involvement in further work

Archaeological involvement in further work is a key component in the ongoing process of assessing known and potential archaeological remains within the development area, to ensure robust and proportionate mitigation for heritage assets which may be impacted by the development.

A detailed Method Statement will be produced by the Retained Archaeologist, for agreement with and approval by the Applicant, and the Archaeological Curator in advance of each archaeological element discussed below. Approval by the Archaeological Curator will be assumed if no response is received within 30 working days of submission of individual method statements. Overviews of methods are given below. These methods are in line with best practice guidance, set out within The Crown Estate (2021) Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects.

1.5.10 Further surveys requiring archaeological involvement

Further surveys requiring archaeological involvement include:

- geophysical survey will require an archaeological assessment of the survey dataset.
- diver/ROV obstruction surveys will require an archaeological assessment of the survey dataset (video and positional data).
- geotechnical investigations will require geoarchaeological assessment and, where necessary, analysis following the staged approach set out below.

Should archaeological material be encountered by these works, sufficient time and resources will be made available to ensure the archaeological assessment of such material. In areas where there are to be further impacts, no impacts will take place until the assessment has been conducted and mitigation actions agreed and implemented. The scope of any further assessment will be agreed with the Archaeological Curator and, where necessary, further suitable mitigation measures will be instigated in agreement with the Archaeological Curator.

1.5.11 Planning surveys

When planning geophysical and geotechnical surveys, the Applicant will advise the Retained Archaeologist well in advance and seek their input into the scope of work. Archaeological input will take the form of advice from the Retained Archaeologist on measures to optimise archaeological results from the planned geotechnical, geophysical and other surveys or work (such as benthic grabs, for example). Areas to be considered will include:

- the available details on previously identified sites and/or anomalies and areas of heightened archaeological potential.
- the archaeological potential of areas where no existing sites and/or anomalies are yet known;
- the equipment, equipment settings, survey methodology(s) and data collection points that will optimise the recovery of archaeological information.
- the requirements for data analysis, interpretation and archiving.

The required response to elements of archaeological input may include:

- altering vibrocore/borehole positions in order to maximise the potential for the collection of archaeological data.
- 'boxing' wreck sites in order to provide the best possible images and positional data.
- altering grab sample positions in order to maximise the potential for the collection of archaeological data.

1.5.12 Fieldwork

Where further survey work has, as one of its objectives, the ensonification of previously identified sites and / or anomalies in order to alter or remove an AEZ, the Applicant will make provision for a suitably qualified Archaeological Geophysical Contractor (which may be the Retained Archaeologist) to be available to provide advice and input into the survey and as the survey is ongoing. In some cases, this may include the presence of the Retained Archaeologist on the vessel alongside the vessel crew, or, in most cases, this advice may be given remotely. Remote advice of this nature has been successfully provided in the 2019 UXO campaign for the Transmission Assets area, for the investigation of AEZs and high potential archaeological anomalies. This type of advice is also anticipated to be employed during the upcoming 2020 UXO campaign for the Generation Assets area. In all cases the archaeologist will ensure that the best possible data is collected for those anomalies subject to review.

1.5.13 Archaeological assessment of marine geophysical survey data

Data gaps currently exist within the coverage of geophysical survey data covering the areas of impacts associated with the proposed development. The project has therefore made a commitment to collection of full coverage survey data (covering the area of proposed impacts) prior to any impacts taking place. This data will be archaeologically assessed and recommendations for mitigation, including any necessary AEZs, will be made.

Additionally, new marine geophysical data that covers areas of development impact and AEZs will be subject to analysis by a suitably qualified Archaeological Geophysical Contractor (the Retained Archaeologist, if suitable). Any such assessment will be preceded by a method statement which will set out in detail the methods to be used, along with the aims and objectives of the work. The method statement will be submitted to the archaeological curators prior to the work being conducted. Approval by the Archaeological Curator will be assumed if no response is received within 30 working days of submission of individual method statements.

In order to maximise the potential benefits of any geophysical survey, the Applicant will seek archaeological input at the planning stage of any such works.

Surveys will be carried out to a single datum and co-ordinate system. All survey data, including navigation (position, heading and velocity) will be acquired digitally in industry-standard formats. Care will be taken to maintain the orientation and altitude of sensors online. Track plots will be corrected for layback (including catenary effects) and made available in digital (geographical information system (GIS)) form.

Once the surveys have been processed to meet their primary objectives, the survey data, together with factual reports, will be made available in digital formats to the Applicant's Retained Archaeologist, or a suitably qualified Archaeological Contractor for archaeological analysis and interpretation.

Archaeological interpretation may include:

- examination of side scan sonar, magnetometer, multi-beam and seismic data, where acquired, for areas within the vicinity of known wreck sites and previously identified geophysical anomalies.
- examination of side scan sonar, magnetometer, multi-beam and seismic data, where acquired, within areas that will be subject to development to identify any as yet unknown wreck remains.
- the assessment of seismic data and the GIR to plot the general trend of the subsurface sediments with archaeological potential.

An example of the criteria for assessing the archaeological potential of contacts is set out in **Error! Reference source not found.**.

Table 1.4: MSDS Marine Criteria For The Assessment Of Potential

Potential	Interpretation
Low	A contact potentially of anthropogenic origin but that is unlikely to be of archaeological significance – Examples may include; discarded modern debris such as rope, cable, chain or fishing gear, small, isolated contacts with no wider context or small boulder like features with associated magnetometer readings.
Medium	A contact believed to be of anthropogenic origin but that would require further investigation to establish its archaeological significance – Examples may include; larger unidentifiable debris or clusters of debris, unidentifiable structures or significant magnetic anomalies.
High	A contact almost certainly of anthropogenic origin and with a high potential of being of archaeological significance – high potential contacts tend to be the remains of wrecks, the suspected remains of wrecks or known structures of archaeological significance.

The archaeological interpretation or findings of any further geophysical surveys will be compiled as a report by the Archaeological Contractor and will include likely requirements (if any) for further work or any required changes to mitigation including the addition, removal or alteration of AEZs. The report will be submitted to the Applicant by the Retained Archaeologist and to the Archaeological Curator. The scope of any further work will be agreed by the Applicant and the Archaeological Curator.

1.5.14 Archaeological assessment of diver/ROV survey data

Seabed photography and video footage will be subject to archaeological assessment and analysis by a suitably qualified Archaeological Contractor. Any such assessment will be preceded by a method statement which will set out in detail the methods to be used, along with the aims and objectives of the work. The method statement will be submitted to the archaeological curators prior to the work being conducted. Approval by the Archaeological Curator will be assumed if no response is received within 30 working days of submission of individual method statements.

To maximise the potential benefits of any proposed diver/ROV surveys, the Applicant will seek archaeological input at the planning stage of any such works.

Archaeological input will take the form of advice from the Retained Archaeologist on measures to optimise archaeological results from the planned survey. Advice will include:

- the available details of sites and/or anomalies identified in the desk based assessment.
- the archaeological potential of areas where no existing sites and/or anomalies are yet known.
- the type and level of diver/ROV positioning, voice recording and video/still recording to be utilised.
- the provision of clear guidance on the types of sites and finds that are to be reported and recorded.
- wherever possible input into the scope of works to include potential archaeological sites/AEZs where more detailed mitigation planning is required.
- other specific advice will be given depending on the nature and purpose of the investigations. All such areas would be outlined within the method statement for the work.

Consideration will be given to having an Archaeological Contractor (or archaeological team) present during any diver or ROV surveys, either as an observer(s) or participating diver(s) to optimise archaeological results and thereby reduce the need for repeat survey. However, operational constraints as well as the relevance and scope of the operation, will have to be taken into account when trying to accommodate archaeologists aboard.

Following the completion of the diver/ROV survey all data, including video footage, will be reviewed by the Archaeological Contractor. This review will identify any anomalies or sites that are potentially of archaeological interest. A report will identify those sites and/or geophysical anomalies that are of sufficient archaeological interest to warrant further investigation and/or mitigation. It will also identify those sites that are no longer of archaeological interest, and hence may be removed from the list of AEZs.

The archaeological results of any diver/ROV survey will be compiled in a report by the Archaeological Contractor. The report will include a statement of the likely requirements (if any) for further archaeological work and mitigation.

The report will be forwarded to the Retained Archaeologist, who will submit it to the Applicant and the Archaeological Curator for a decision on the scope of any further work where required.

1.5.15 Geoarchaeological assessment of geotechnical data

Broadly, the aim of the archaeological assessment of geotechnical data as set out within COWRIE's Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011) is to:

- 'investigate the deposition sequence of sediments within the area represented by the cores to identify, as far as possible, the environments within which this deposition took place.
- evaluate the potential for past human exploitation and occupation of these past environments.
- produce an overview of the geological stratigraphy to provide an indication of the prehistoric archaeological potential for the area.
- comment on the archaeological importance of the identified deposits, within the context of the wider palaeoenvironmental history of the region and the UK'.

In line with these aims, and the COWRIE guidance (Gribble and Leather, 2011) new geotechnical surveys will be subject to archaeological input. Following best practice guidance this input should begin prior to core collection, and should proceed to a staged process of assessment and analysis (The Crown Estate, 2021).

Early input should seek to determine methods and specifications for geotechnical sampling (e.g. vibrocores, boreholes etc.) and engagement with the Applicant and their geotechnical team should aim to find ways to ensure archaeological aims and sampling can be conducted alongside any other requirements. Following these discussions a Method Statement for Core Collection, Transport, Retention and Storage should be produced, ensuring that cores are stored in a way which facilitates later assessment or analysis, if required.

This Method Statement may also include methods for the Stage one and two geoarchaeological assessment (see below).

Early input should also include recommendations on core locations from a geoarchaeologist. Typically, this process involves close collaboration with the Site Investigation team. Archaeological input into geotechnical core locations can allow for the greatest insights into the palaeolandscape. Round-table discussions and the review of seismic profiles tends to be a conducive method of allowing engineering and archaeological requirements to be taken into consideration when micro-siting geotechnical cores.

Following the collection of geotechnical cores, it is recommended that they undergo a staged program of geoarchaeological assessment and analysis as the primary means of ground-truthing the potential identified in this report, and of mitigating impacts to remains. In brief the process is as follows:

- **Stage 1: Geoarchaeological review of core logs**: This stage involves a desk based assessment of the geotechnical core logs performed by a professional geoarchaeologist in order to determine which cores may be of interest. The selected cores will then be recommended for further study (Stage 2). Stage 1 assessment requires all cores to be recorded such that sediments that may be of archaeological interest can be identified. The scope of any further work will be agreed by the Applicant and the Archaeological Curator before proceeding to the next stage of assessment. If no further work is recommended a final report will be produced by the Archaeological Contractor.
- **Stage 2: Geoarchaeological recording:** This stage involves further study of the cores that may be of archaeological interest identified in Stage 1 to identify archaeological potential. The cores will be physically assessed by a geoarchaeologist who will confirm the sediments present within the cores and determine their archaeological potential and make recommendations for any suitable cores to be assessed further (Stage 3). At this point a report will be produced presenting the results of the Stage 1 and 2 analyses, recommending further study if necessary, and methodologies for any further work. The scope of further work will be agreed by the Applicant and the Archaeological Curator. If no further work is recommended, a final report will be produced by the Archaeological Contractor.
- **Stage 3: Geoarchaeological assessment:** This stage involves taking samples from the cores with archaeological potential identified in Stage 2. The samples will be analysed to determine the age and the value surviving paleoenvironmental material contained within the samples. The aims for the palaeoenvironmental analysis included establishing the preservation, diversity, and quantity of palaeoenvironmental material for the purpose of better characterising its origin environment. Any suitable material can be recommended for further study (Stage 4) if necessary. A report for the results of the Stage 3 analysis will be produced, it will also outline whether further analysis is necessary or will state if no further work is recommended.
- **Stage 4 and 5: Geoarchaeological analysis and publication**: This stage involves further, more detailed analysis of core samples. A report will be produced after this Stage including the results of all previous work, core location maps, sediment sequences, 2D and 3D images of the cores where necessary. The report will discuss the interpretation of palaeoenvironments in detail based on analysis of the cores and present all relevant information gathered during the desk based assessments. The work will be undertaken to publication standard. The report will be forwarded to the Retained Archaeologist, who will submit it to the Applicant and the Archaeological Curator.

This work should be undertaken by a trained geoarchaeologist. Each stage should inform the scope of the next, and work may cease at any point where no recommendations for further work are made. This would be the case if, for example, cores were determined to hold no geoarchaeological potential at the end of Stage 2.

This geoarchaeological assessment and analysis should aim to deliver conclusions on the prehistoric archaeological and palaeoenvironmental remains within the area. Further mitigation may be required based on the results of this assessment. The geoarchaeological work should follow guidance set out within COWRIE's Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011).

The use of an appropriate protocol for archaeological discoveries such as the Crown Estates Protocol for Archaeological Discoveries: Offshore Renewables Projects also provides mitigation for prehistoric and palaeoenvironmental remains.

1.6 Activities subsequent to investigations

Following the stipulations of the Marine Policy Statement (MPS) that *"opportunities should be taken to contribute to our knowledge and understanding of our past by capturing evidence from the historic environment and making this publicly available, particularly if a heritage asset is to be lost"* (paragraph 2.6.6.3 of MPS), the project recognises that any future geophysical and geotechnical surveys undertaken will produce new archaeological data and understandings of the historic marine environment of the area. The results of these investigations will ultimately be made publicly available. This commitment (set out within volume 2, chapter 11) will be satisfied by reporting, deposition of reports through the OASIS system and archiving of the project. In addition, should the results warrant it, publication will be undertaken.

1.6.1 OASIS V

In late 2020 the Online Access to the Index of Investigations (OASIS) version V was launched by the Archaeological Data Service (ADS). OASIS is an online form which allows for archaeological investigations to be reported to regional HERs and national heritage bodies. The system also allows for reports to be shared for public release through the ADS library. Reporting through OASIS has been incorporated within this WSI, in line with best practice.

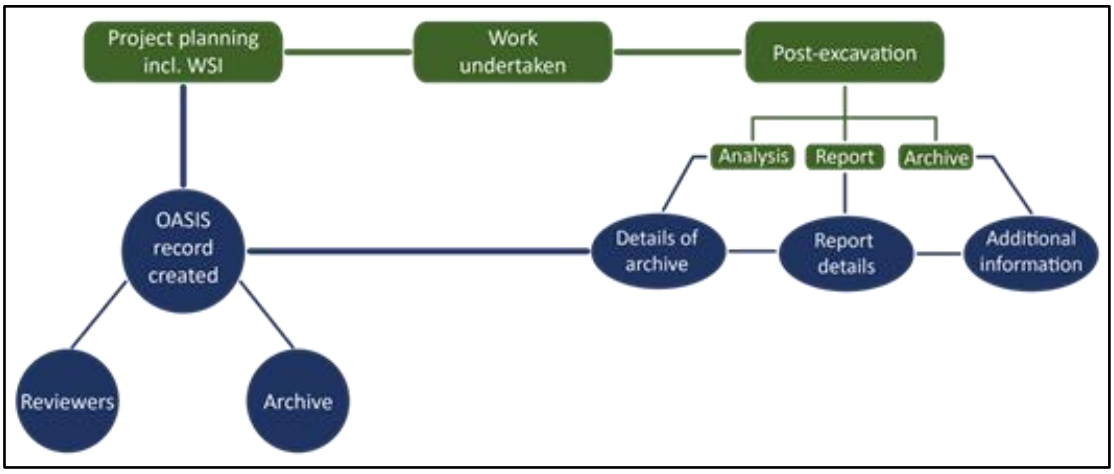

Figure 1.11: OASIS V Procedure And Standard Archaeological Workflow

In contrast to previous iterations of OASIS, OASIS V is a new, flexible system that is kept live throughout the course of a project. An overview of the new system is set out in Figure 1.11. The new system recommends that an overarching OASIS record be established at project inception (for example on receipt of marine licenses and production of a WSI).

An OASIS record will therefore be set up following consent, to notify the relevant authorities of future work that is taking place. The Applicant must then ensure that an archaeological report is submitted to NRW/MMO, Cadw, Historic England and (if the work is within the intertidal zone) CPAT following completion of any survey and subsequent investigation. The contents of this report must be agreed and accepted by the archaeological curator(s) and NRW/ the MMO. The Applicant must then ensure that a copy of the agreed archaeological report is submitted through the OASIS form within 2 weeks of acceptance by the relevant archaeological curator(s), NRW and the MMO. Sign off on the OASIS record will be by the RCAMHW who is responsible for administering

the OASIS reporting system. The Applicant should notify NRW and the MMO that the OASIS report has been submitted within 2 weeks of the submission.

1.6.2 Reports

Reports should be prepared in accordance with the guidance provided in the relevant CIfA Standard and Guidance (see http://www.archaeologists.net/codes/cifa) and with reference to any other activity or analysis specific guidance. Reports will also satisfy all requirements set out within the relevant method statement covering the work package.

The timetable for depositing archives with the receiving institution after completion of the post-fieldwork programme will be set out in the relevant Method Statement.

In the event that little of significance is found during the course of the scheme construction, a final report on the investigative work will be prepared by the Archaeological Contractor within six weeks of completion of all construction.

If significant archaeological sites and finds are recorded, then this final report will be preceded by the submission to the Retained Archaeologist by the Archaeological Contractor(s) of investigation reports following the completion of fieldwork.

The Archaeological Contractor will also be required to produce an assessment report which will establish the value of the recorded archaeology and provide a costing for the post-excavation analysis, publication and archiving (including deposition of archive).

Reports are expected to detail the work undertaken and the archaeological evidence encountered. They should discuss the importance of the results including their potential contribution to archaeological knowledge and understanding, including relevant research frameworks.

In accordance with guidance issued by the Crown Estate (2021) reports will typically include:

- a non-technical summary.
- the aims and methods of the work.
- the results of the work including finds and environmental remains.
- a statement of the potential of the results.
- an explanation of how this work is relevant to the objectives and research agendas from applicable local and national archaeological research frameworks.
- proposals for further analysis and publication.
- illustrations and appendices to support the report.

Where appropriate the report should provide recommendations for further assessment and/or analysis requirements.

The Applicant will provide a digital (pdf) copy of each report to the Archaeological Curator, NRW and the MMO (as appropriate) following survey completion.

Decisions regarding the level of post-excavation work, if required, will be taken following submission of investigation reports and consultation by the Applicant and the Retained Archaeologist with the Archaeological Curator.

Following the production and acceptance of archaeological reports they will be deposited with the relevant repositories, including the NRHE and RCAHMW, by submitting an OASIS form with a digital copy of the report.

1.6.3 Publication

In consultation with the Applicant and the Archaeological Curator, the Retained Archaeologist will ensure that the results of important archaeological investigations undertaken in connection with the project will be published in an integrated manner. Publication media and all publication matters will be discussed and agreed in advance with the Applicant and Archaeological Curator.

1.6.4 Archives

Archive planning will be included within detailed Method Statements for each activity undertaken. Archiving will follow best practice as laid out within:

- Brown, D. 2011. Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation. Archaeological Archives Forum.
- CIfA. 2020c. Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives.
- The Crown Estate. 2021. Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (Section 13.5: Archiving).

The Archaeological Curator will be notified of any archaeological investigation in advance of fieldwork and any specific requirements relating to the preparation and deposition of project archives will be accommodated as appropriate.

Where there is the likelihood of any archaeological fieldwork, the Retained Archaeologist will contact an appropriate receiving institution to discuss the intended fieldwork and seek its agreement to accept the site archive for long-term storage and curation. The Retained Archaeologist will consult the receiving institution regarding its policy on the selection, retention and disposal of excavated material, and to confirm the requirements in respect of the format, presentation and packaging of archive records and materials. A museum Accession Number will also be sought on each occasion. For offshore digital data, it may be appropriate to archive this with a Marine Environment Data and Information Network (MEDIN) Data Archive Centre (DAC).

Project archives, including written, drawn, photographic and material elements (together with a summary of the contents of the archive) will be prepared and deposited by the Retained Archaeologist in accordance with the requirements of the receiving Museum, repository or digital archive.

Written, drawn and photographic archives will be compiled to a standard that allows for the publication of a summary report. Written archives will be on clean, stable materials, and will be suitable for photocopying. The materials used will be of the standard recommended in Guidelines for the Preparation of Excavation Archives for Long-term Storage (Walker, 1990).

Born-digital records, including digital photographs, will be stored and deposited in accordance with guidelines issued by the receiving repository, CifA (2023), Historic England (2015), and the ADS (2023).

The timetable for depositing archives with the receiving repository after completion of the post-fieldwork programme will be agreed with the Applicant and Archaeological Curator.

On completion of the scheme, an OASIS form will be produced, and copies of all archaeological reports will be attached as data files. Notification of the completion of the OASIS form will be sent to Archaeological Curators and NRW and/or the MMO (where appropriate).

The costs of archiving (whether digital, paper or object) will be met by the Applicant. Tenders or costings by contractors for work packages should include provision for the preparation and deposition of the expected archive.

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Appendix U1: Protocol for reporting finds of archaeological interest

U1.1 Purpose of the document

This appendix sets out the procedure for reporting discoveries of potential archaeological interest made during construction, operation, maintenance and decommissioning activities associated with the Project.

The aim of the protocol for reporting finds of archaeological interest is to reduce any adverse effects of the development upon the historic environment by enabling people working on the project to report their finds in a manner that is both convenient to their every-day work and effective regarding curatorial requirements.

The archaeological finds made during these works are important because they shed light on past human use of the landscape, sea, and seabed. The information that such discoveries bring to light can help archaeologists to better understand what happened in the past, and therefore to better protect those aspects of our history and pre-history that should be conserved on behalf of future generations.

U1.2 Protocol Details and Version

The Protocol that will be used is based on the Protocol for Archaeological Discoveries (PAD) for Offshore Renewables Projects introduced by The Crown Estate (The Crown Estate, 2014).

U1.3 Circumstances of Discovery

This PAD addresses finds of archaeological interest made on the seabed, intertidal zone or on board vessels during a wide range of activities associated with construction, operation, maintenance and decommissioning of the Project.

U1.4 Scope of the Protocol

The Applicant will employ a Retained Archaeologist to provide archaeological consultancy and to liaise with and report as appropriate to the Contractors, the Applicant, and the Archaeological Curator.

U1.5 Operations of the Protocol

U1.5.1 Introduction

The PAD has been designed to allow Applicants to report unexpected finds of archaeological interest made on the seabed during development works. A series of actions is defined for such cases.

The Protocol anticipates that discoveries made by Project Staff are reported to the Site Champion (e.g. Vessel Master or Site Foreman) on their vessel or site, who then reports to the Nominated Contact (the Retained Archaeologist is the recommended Nominated Contact).

The Retained Archaeologist will liaise with the Applicant and the Archaeological Curator, along with any additional relevant stakeholders depending on the nature and significance of the find, and planned activities within the area. Additional mitigation may be recommended depending on the nature of the find.

U1.5.2 Terms and Roles

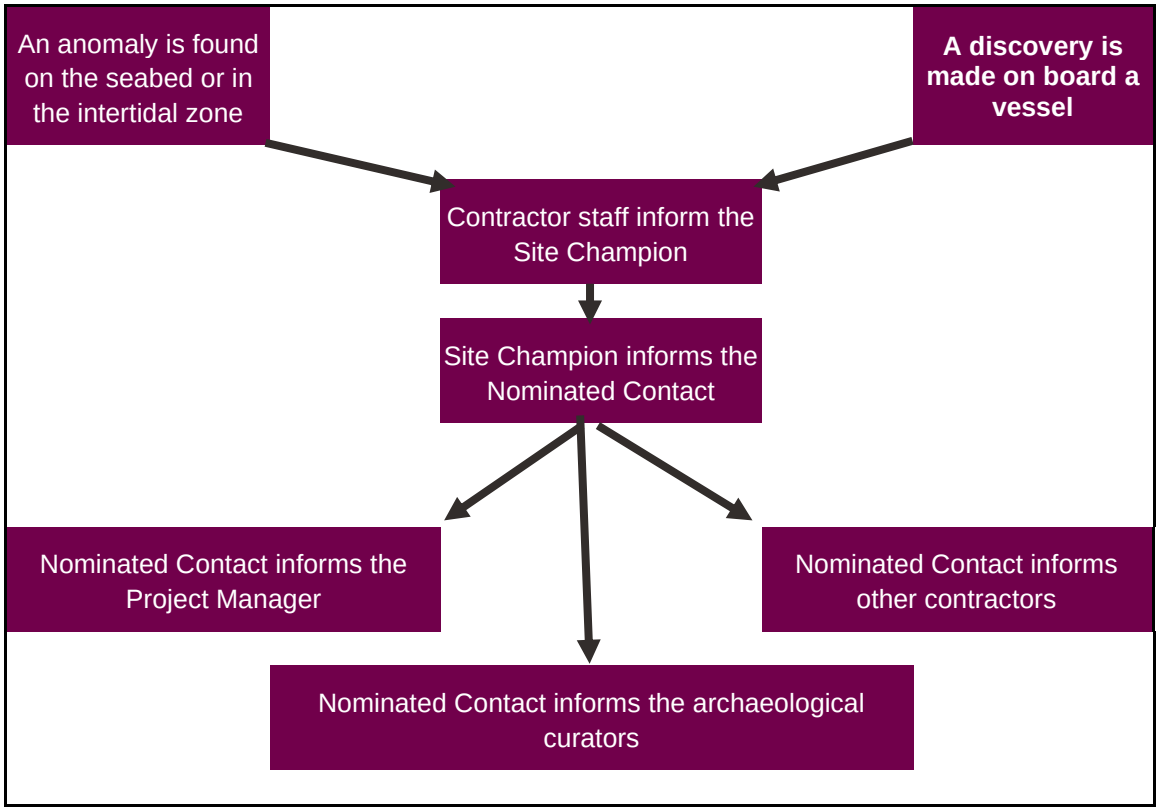

Figure 1.12: Summary of the key roles and steps in the PAD process

A summary of the key roles and steps in the PAD process are set out in the figure above.

On the vessel or site, the person responsible for reporting anomalies or finds will be the Site Champion. Anomalies or finds will be brought to the attention of the Site Champion by the Contractors or Project Staff. The Site Champion will inform the Nominated Contact (who can be the Retained Archaeologist).

The Applicant's Retained Archaeologist can provide specialist advice on finds identification, assessments of significance, and technical support services relating to the mitigation of the impacts of the project on the historic environment[1].

[1] Note, the Crown Estate (2014) Protocol for Archaeological Discoveries includes an additional step whereby the report is passed to the Implementation Service who provide additional support on identification and input into mitigation. This Service is run by an archaeological contractor. The Retained Archaeologist, who has access to all project datasets and typically has a strong understanding of the archaeological potential of the area, along with specialists in maritime archaeology, is best placed to give this advice. As such there is no need for the inclusion of the additional step of corresponding with the Implementation Service, who do not have access to the up to date project data. They will therefore not be included within the Protocol for Archaeological Discoveries implemented during this project. The 2021 Crown Estate guidance on Archaeological Written Schemes of Investigation, which post-dates the 2014 PAD guidance, indicates that although the 2014 guidance sets out one protocol, others can also be used and further states that the 2014 guidance can be used to '*support the development of a protocol for any OWF* project' (Crown Estate, 2014: 42). The approach set out here is therefore in line with existing guidance.

The Retained Archaeologist, along with the Applicant and their contractors shall draw to the attention of all relevant staff the potential for archaeological material to be found during survey and inform them of the possible importance of such finds.

Personnel working on the project will be briefed on the Protocol for Archaeological Discoveries and copies of this Protocol will be available onboard the survey vessels and on all sites.

U1.5.3 Legal Implications

It should be noted that if the wreck of an aircraft is encountered it may be automatically protected as a protected place under the terms of the Protection of Military Remains Act 1986 and it is an offence to tamper with, damage, or move the wreck or to remove items.

Furthermore, all items of 'wreck' are reportable to the Receiver of Wreck under the terms of the Merchant Shipping Act 1995. Appropriate finds will be reported to the Receiver of Wreck within the required timescales (28 days) by the Retained Archaeologist, thereby satisfying this legal requirement.

U1.6 Guidelines for Identifying and Handling Finds

The following guideline can be used to identify any discovered material and must be referred to when planning appropriate handling and storage. Advice on the identification of finds has been provided following the accepted advice provided by The Crown Estate in their Protocol for Archaeological Discoveries (2014). Further advice on finds can be sought from the Retained Archaeologist.

Archaeological material can come in a variety of sizes, shapes and materials. Materials can degrade in different ways so it is important that they are handled with care and that the appropriate handling and storage techniques are applied.

Finds are vulnerable to deterioration at all times, whether they are recovered or not. Fragile material, such as wood, can be damaged by the force of passing machinery. It is crucial that all finds be treated carefully and interfered with as little as possible.

Leaving finds in situ is the best way to manage them. Once a find is recovered to the surface, it requires conservation which can be difficult and expensive to administer.

U1.7 General advice for finds handling and storage:

- ⊕ Handle all finds carefully
- ⊕ Photograph all sides of a find with a scale
- ⊕ Take close up photographs of any markings, glazing, or imagery
- ⊕ Keep finds wet and ensure the water is changed regularly if biological growth is detected
- ⊕ Keep finds cool and ideally in the dark
- ⊕ Keep finds in protective containers where possible
- ⊕ Label any finds
- ⊕ Follow the information below on finds storage and contact the Retained Archaeologist if further advice is required
- ⊗ Do not attempt to clean the find by removing any sediment build up, concretion, or marine life
- ⊗ Do not allow finds to dry out
- ⊗ Do not handle finds more than necessary

U1.7.1 Metal

Metal is likely to survive in marine environment, though it may corrode when in water or form concretions of material (a hard mass of material which typically has a mineral matrix, commonly formed around ferrous objects in particular). Typical metal finds might include ingots, ballast, coins, ornaments, tools, weapons, aircraft or ship parts, and personal items. The Crown Estate Guidance for the identification of metals is as follows:

U1.7.1.1 Iron and Steel

The potential range and date of iron and steel objects is so wide that it is difficult to provide general guidance. In broad terms, iron and steel objects which are covered by a thick amorphous concrete-like coating ('concretion') are likely to be of archaeological interest and should be reported. Pieces of metal sheet and structure may indicate a wreck and should be reported. Specific operational measures are likely to apply in respect of ordnance (cannonballs, bullets, shells) which should take precedence over archaeological requirements. However, discoveries of ordnance may be of archaeological interest, and they should be reported.

U1.7.1.2 Other Metals

Items made of thin, tinned or painted metal sheet are unlikely to be of archaeological interest. Aluminium objects may indicate aircraft wreckage from World War Two, especially if two or more pieces of aluminium are fixed together by rivets. All occurrences should be reported and remains of this nature may be subject to the Protection of Military Remains Act 1986. 'Copper and copper alloy (bronze, brass) objects might indicate a wreck, or they may be very old. All occurrences should be reported. Precious metal objects and coins are definitely of archaeological interest because they are relatively easy to date. All occurrences should be reported' (The Crown Estate 2014: 19).

U1.7.1.2.1 Actions to take:

If possible, do not recover metal. It can be difficult and expensive to conserve and some types of site, such as aircraft, are covered by specific legislation which prohibits recovery without appropriate licences.

For metals which are lifted, lifting should be carried out carefully and the find should be photographed. All metals should be stored in cool seawater. Different metals should not be stored together. The shape of the concretion can be used to identify the item and as such concretions should not be removed. If the find is too large to cover in seawater, wrap it in soaked material and keep wet. Some metal products (e.g. lead, pewter and copper salts) can be toxic, so handle with gloves or wash hands thoroughly after contact.

Metals can sometimes be identified from the colour of their corrosion. Below is a table to help identify the type of metal used.

Table 1.5: Metals and corrosion patterns

Metal	Corrosion
Gold	No corrosion.
Silver	White, waxy layers that turn lilac in the light.
Copper/Copper Alloy (e.g. Bronze)	Dark red/purple/green/blue.
Iron/Steel	Black or rusty with a crust of concretion.
Lead	Gre or white crystals.
Pewter/Tin/Lead Alloy	Grey surface, possibly crystalline, soft or friable.
Aluminium	Little corrosion.

U1.7.2 Ceramics

Pottery can be made from china, porcelain, terracotta, earthenware and other clay-based materials. Typical finds might include crockery, ornaments, clay pipes, lamps, containers and tableware. Any fragment of pottery is potentially of interest, especially if it is a large fragment. Items which look like modern crockery can be discarded, but if the item has an unusual shape, glaze or fabric it should be reported (The Crown Estate, 2014: 19). Additionally, clay pipes should be reported.

U1.7.2.1 Actions to take:

Photograph finds with a scale, especially if they have any glazing or markings. Store in saltwater.

U1.7.3 Ceramic Building Material

Ceramic building material can be in the form of bricks, building blocks, mudbricks, and tile. Bricks and tile can appear unusually shaped. Ceramic building material can be evidence of a ship, or submerged settlement.

Bricks with modern proportions and v-shaped hollows (‘frogs’) are of no archaeological interest. Unfrogged, ‘small’, ‘thin’ or otherwise unusual bricks may date back to Medieval or even Roman times and should be reported (The Crown Estate, 2014: 19). Occurrences of tile should also be reported.

U1.7.3.1 Actions to take:

Photograph finds with a scale, especially if they have any glazing or markings on them. Store in saltwater.

U1.7.4 Stone

Stone has been used by humans for thousands of years and it very durable underwater, making it a common find. There are different types of stone; quartz, limestone, marble, granite, obsidian, slate, sandstone, and flint. Typical finds might include ballast, anchors, millstones building material, shot, carvings, tools, sculptures, whetstones, flint or stone tools and other personal items.

Small to medium size stones that are shaped, polished and/or pierced may be prehistoric axes. All occurrences should be reported. Objects such as axe heads or knife blades made from flint are likely to be of prehistoric date and should be reported. Large blocks of stone that have been pierced or shaped may have been used as anchors or weights for fishing nets. All occurrences should be reported. The recovery of numerous stones may indicate the ballast mound of a wreck, or a navigational cairn. All occurrences should be reported (The Crown Estate, 2014: 19).

U1.7.4.1 Actions to take:

Photograph with a scale and then store in water, or wrap in soaked towelling.

U1.7.5 Skeletal Material and Faunal Remains

Skeletal finds and faunal remains can come in the form of bone, ivory, tooth, antler, baleen, tortoiseshell, tusk, or shell. Typical finds might include human or animal remains, personal items such as combs or jewellery, carvings and tool handles.

Discoveries of animal bone, teeth and tusks are of archaeological interest because they may date to periods when the seabed formed dry land, and should be reported. Such bones, teeth, tusks etc. may have signs of damage, breaking or cutting that can be directly attributed to human activity. Large quantities of animal bone may indicate a wreck (the remains of cargo or provisions) and should be reported. Human bone is definitely of archaeological interest, and may, if buried and found within territorial waters, be subject to the provisions of the Burial Act 1857. Alternatively, it may be subject to the Protection of Military Remains Act 1986. Any suspected human bone should be reported, and treated with discretion and respect.

Objects made out of bone – such as combs, harpoon points or decorative items – can be very old and are definitely of archaeological interest. All occurrences should be reported (The Crown Estate, 2014: 19).

U1.7.5.1 Actions to take:

Skeletal finds are vulnerable to environment change, so if any are recovered, ensure they are photographed with a scale and then immediately submerge in seawater and seal in a suitable container. Change the water if biological growth occurs (e.g. algae mould).

U1.7.6 Wood

Wooden finds could be evidence of a wrecked vessel. Typical wooden finds might include small personal items (e.g. tools and bottle corks), or larger finds (e.g. ships timbers, furniture, chests, barrels, dwelling posts, and wattle panels).

Light coloured wood, or wood that floats easily, is probably modern and is unlikely to be of archaeological interest. 'Roundwood' with bark – such as branches – is unlikely to be of archaeological interest, although it may provide paleo-environmental evidence. However, roundwood that has clearly been shaped or made into a point should be reported. Pieces of wood that have been shaped or jointed may be of archaeological interest, especially if fixed with wooden pegs, bolts or nails – all occurrences should be reported. Objects made out of dark, waterlogged wood – such as bowls, handles, shafts and so on – can be very old and are definitely of archaeological interest. All occurrences should be reported (The Crown Estate, 2014: 19).

U1.7.6.1 Actions to take:

Timber finds are often very fragile and so must be lifted with care. Photograph with a scale. Do not allow the wood to dry out and ensure that it has sufficient support to stop it falling apart and submerge it in seawater. Keep the find in a cool and dark area. Change the water if biological growth is detected (e.g. algae or mould). If the find is too large to store in water, try to keep it damp and cool in a darkened area.

U1.7.7 Peat and Clay

Peat is black or brown fibrous soil that formed when sea level was so low that the seabed formed marshy land, for example on the banks of a river or estuary. Peat is made up of plant remains, and also contains microscopic remains that can provide information about the environment at the time it was formed. This information helps us to understand the kind of landscape that our predecessors inhabited, and about how their landscape changed. It can also provide information about rising sea-level and coastline change, which are important to understanding processes that are affecting us today. Prehistoric structures (such as wooden trackways) and artefacts are often found within or near peat, because our predecessors used the many resources that these marshy areas contained. As these areas were waterlogged, and have continued to be waterlogged because the sea has risen, 'organic' artefacts made of wood, leather, textile and so on often survive together with the stone and pottery which are found on 'dry' sites.

Fine-grained sediments such as silts and clays are often found at the same places as peat. These fine-grained sediments also contain the microscopic remains that can provide information about past environments and sea level change. Any discoveries of such material would be of archaeological interest, and their occurrence should be reported (The Crown Estate, 2014: 20).

U1.7.7.1 Actions to take:

Any sediments collected should be stored in a sealed container with seawater and keep cool. Do not try to break apart the deposits.

U1.7.8 Fibre and Textiles

Fibrous finds are unlikely to survive in marine conditions, but occasionally they do. Typical fibrous finds might include ropes and rigging, weaving, sailcloth, sacks, clothing, basketry, fishing nets etc.

U1.7.8.1 Actions to take:

Due to the incredibly fragile nature, once any fibrous or textile find has been recovered it must be dealt with quickly. Take photographs with a scale, but do not use flash. Carefully place it in a sealed container. Try to keep it out of the light. If possible, keep the find in its original burial deposit (e.g. the sediment it was found in, and seawater). This will help to protect the material.

U1.7.9 Plastic, Robber, etc

In most cases, rubber, plastic, Bakelite and similar modern materials are not of archaeological interest and can be disregarded. One exception is where such materials are found in the same area as aluminium objects and structures, which may indicate aircraft wreckage from World War Two. Such material should be reported (The Crown Estate, 2014: 14).

U1.7.9.1 Actions to take:

Do not bend or clean any plastic or rubber finds. Photograph the find with a scale and then store in seawater in a cool and dark area.

U1.7.10 Resinous or Mineral Substance

These materials include amber, jet, coal, or bitumen. Typical finds might include ornaments, jewellery, beads, sealants or caulking materials, all of which would be of archaeological interest and should be reported.

U1.7.10.1 Actions to take:

These finds might appear stable, but if they are not stored properly, they may begin to deteriorate. Photograph a find with a scale, and then keep stored in seawater.

U1.7.11 Glass

Glass artefacts are found on the seabed. Finds may include bottles, beads, panes of glass from ship's windows. Unless obviously modern (beer bottles etc) glass finds should be reported, particularly where it occurs alongside other finds as this may represent a wreck site.

Glass is likely to survive in marine conditions, but it does degrade; glass deterioration is usually categorised by leaching, with causes an iridescent pattern to form on the glass, it looks somewhat like an oil slick. It can also begin to flake away.

U1.7.11.1 Actions to take:

Photograph with a scale before packing carefully to avoid breakage. Ensure it is covered in cool seawater in the dark.

Appendix U2: Protocol for Archaeological Discoveries: Preliminary Record Form

U2.1 Preliminary Record Form: Discoveries on the seabed/ on board

Protocol for Archaeological Discoveries			
Preliminary Record Form: Discoveries on the seabed/ on board/ in the intertidal zone / on land			
Company Name			
Vessel/Team Name			
Site/Sea Area Name			
Date			
Time of compiling information			
Name of compiler (Site Champion)			
Name of finder (if different from above)			
Time at which discovery was encountered			
Vessel position at time when anomaly was encountered			
Latitude		Longitude	
Datum (if different from WGS84)			
Original position of the anomaly on the seabed, if known			
Notes on likely accuracy on position stated above:			
How accurate is the position?			
Is the position the original position or has the material been moved by operations?			
Details of circumstances that led to the discovery			
Description of the find / anomaly			
Apparent size /extent of the anomaly			
Details of any find(s) recovered			
Details of any photographs, drawings of other records made of the find(s) (e.g. location figure)			
Details of treatment or storage of find(s)			
Date and time Nominated Contact informed			
General notes if discovered on the seabed:			
Derived from (e.g. Obstacle Avoidance Sonar, Cable Tensiometer?)			
Apparent size/ extent of anomaly (length, width, height above seabed)			
Extent of deviation/ route development			
Signed		Date	