

Technical Appendix 11.3:

Written Scheme of Investigation



Falmouth Docks Development Falmouth, Cornwall

Offshore Written Scheme of Investigation

Planning Ref.: PA23/06550
Report Ref.: 268642.03
November 2024



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Document Information

Document title	Falmouth Docks Development, Falmouth, Cornwall
Document subtitle	Offshore Written Scheme of Investigation
Document reference	268642.03
Client name	Ramboll
Address	Carlton House Ringwood Road Woodlands Southampton SO40 7HT
On behalf of	A&P Group
Address	The Docks Falmouth Cornwall TR11 4NR United Kingdom
Site location	Falmouth Port, Falmouth
County	Cornwall
National grid reference	Centred on 181777 032765 (SW 81777 32765)
Statutory designations	Marine and Coastal Access Act (Falmouth Harbour)
Planning authority	Conwall Council; Marine Management Organisation
Planning reference	PA23/06550
WA project name	Falmouth Docks Development (Marine) – DBA EIA
WA project code	268642
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Quality Assurance

Issue	Date	Author	Approved by
1	24/05/2024	BJS	AEM/AB
2	02/10/2024	BJS	AEM/AB
3	25/11/2024	BJS	AEM/AB

DATA LICENCES

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Falmouth Docks Development Falmouth, Cornwall

Offshore Written Scheme of Investigation

1 INTRODUCTION

1.1 Project and planning background

1.1.1 Wessex Archaeology has been commissioned by Ramboll UK Limited (the 'Client') on behalf of A&P Group to produce a written scheme of investigation (WSI) for proposed works associated with the Falmouth Docks Development, Falmouth, Cornwall (**Figure 1**).

1.1.2 The proposed development would redevelop and modernise the existing facilities at Falmouth Docks to reinstate full alongside berth capability and increase berth capacity. The objectives of the proposed development are to repair and update the currently poor condition dock infrastructure in order to maintain existing business and future proof the docks with respect to cruise capacity, cargo capacity and renewable floating offshore wind (FLOW) (supporting the offshore wind market).

1.2 Development description

1.2.1 The development is proposed to take place on the site of the existing Falmouth Dock facilities. These are working facilities responsible for the repair, maintenance and provision of shipping. Falmouth Docks is located at SW 81777 32765.

1.2.2 The full planning application and marine licence application (MLA) would comprise the following redevelopment activities:

- Pocket dredge of berth areas to achieve required underkeel clearance for larger cruise vessels (up to Excellence class) and the FLOW renewable energy device underkeel requirements (considered to be -10.5 m Chart Datum (CD));
- Removal of foul ground within areas of the former King's and Empire Wharfs;
- Surface skim of seabed on eastern side of the site to maintain -5.5 m CD;
- Demolition of the remaining existing Western Wharf timber piles and above surface infrastructure;
- Construction of a new Western Wharf suspended deck structure;
- Demolition of the Northern Arm concrete structure and substructure to below seabed level and removal of the gang walkway and old timber piles that are located west of this structure;
- Construction of a suspended deck structure (Northern Wharf) in the existing 90 m gap between Queen's Wharf and the Northern Arm to create a longer functional wharf length;
- Upgrades to the existing Queen's Wharf structure;
- Extension of the Queen's Wharf suspended deck structure 50 m westward;
- Installation of a 290 m deck (the 'FLOW Deck') to facilitate a FLOW device;

- Upgrades to the existing Duchy Wharf structure to facilitate a FLOW device; and
- Demolition of on-site buildings and re-configuration of Falmouth Dock activities.
Construction programme

1.2.3 The overall demolition and construction programme is based on commencement of works in Q4 2025. The demolition and construction is anticipated to be undertaken over an approximately 42-month period, finishing in Q1 2029. The majority of the wharfs, however, are anticipated to be completed after 27 months (in Q4 2027). Refer to Environmental Statement (ES) Chapter 5: Demolition and Construction for further detail

1.3 Scope of document

1.3.1 This WSI sets out the aims of the offshore investigation, and the methodologies and standards that will be employed by the Developer and Retained Archaeologist to implement the mitigation strategy set out in the ES (Ramboll 2024). In format and content, it conforms to current best practice and to the guidance outlined in *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015a), the Joint Nautical Archaeology Policy Committee *Code of Practice for Development* (JNAPC 2006) and the relevant guidance from the Chartered Institute for Archaeologists (CIfA) (CIfA 2017; 2020a – c; 2021; 2022; 2023a; b) (with which Wessex Archaeology is a Registered Archaeological Organisation), as applicable.

1.3.2 A desk-based assessment of the marine archaeology and the archaeological assessment of the geotechnical borehole survey and additional geophysical surveys have been completed (Wessex Archaeology 2024a; 2024b) and identified the known and potential palaeolandscape features, maritime and aviation archaeology and intertidal archaeology, as well as further information feeding into our understanding of the geoarchaeology of the river Fal and wider estuary (see **Section 5.4** for summary). Mitigation, in respect of these anomalies and deposits, where appropriate, for these is set out below (**Section 7**).

1.3.3 This WSI provides a framework for the mitigation measures required to inform potential conditions of the MMO licence with relevance to archaeology and cultural heritage. The WSI sets out the programme of work to be carried out and the methods by which it will be achieved, including reporting. The WSI forms part of a mitigation strategy designed to offset the impact of the development upon potentially significant archaeological remains and deposits.

1.3.4 This document will be submitted to the Archaeological Curator (Historic England), for approval, prior to the commencement of any investigative work. If elements of the WSI need to be discussed with relevant external stakeholders, including the Receiver of Wreck or Ministry of Defence, then this should also occur prior to the WSI being signed off. This could include methodologies for recovering and reporting material or development works that could impact a protected site under the *Protection of Military Remains Act 1986*.

2 THE ARCHAEOLOGICAL ASSESSMENT AREAS

2.1 Co-ordinate system

2.1.1 Positions are reported in the British National Grid coordinate system for all aspects of this report, with heights calculated as distance above Ordnance Datum (Newlyn), as defined by OSGM15 and OSTN15.

2.2 Archaeological Assessment Areas

- 2.2.1 The study area for marine archaeology is the extent of the site (**Figure 1**). The boundary of the marine archaeology study area defines the area where any potential direct impact on marine archaeology receptors may occur.
- 2.2.2 A further 1 km buffer zone beyond the study area was used as a search area for obtaining records of archaeological sites, features and findspots from relevant archive databases. This allowed for a greater understanding of the broader archaeological baseline environment, with the dual purpose of enabling any archaeological trends within the region to be recognised and to allow any heritage assets identified to be represented in a broader archaeological context.

3 AIMS AND OBJECTIVES

3.1 Aims

- 3.1.1 The aim of the WSI is to put in place the archaeological mitigation set out in the ES (Ramboll 2024).

3.2 Objectives

- 3.2.1 The objectives of this WSI are as follows:
- to fulfil the requirements of Historic England in respect of archaeological monitoring and mitigation works associated with this project;
 - to mitigate the impact of dredging within the proposed dredge areas via appropriate and recognised strategies;
 - to provide the position and extent of Archaeological Exclusion Zones (AEZs) that may be required, and to establish methods for their monitoring, modification and/ or removal in the future;
 - to ensure that any further geophysical and geotechnical investigations associated with the project are subject to archaeological input, review, recording and sampling;
 - to propose measures for mitigating effects upon any archaeological material that may be encountered during the operations associated with the scheme including watching briefs on dredgers;
 - to ensure that any ROV and/ or diver surveys associated with the project are subject to archaeological input and that any data produced is archaeologically assessed;
 - to propose measures for the mitigation of unexpected archaeological remains encountered during further survey work or construction work associated with the project; and
 - to establish the reporting and archiving requirements for the archaeological works undertaken during construction and post-construction monitoring.

3.3 Addressing questions from the Research Agendas

- 3.3.1 Themes and areas of research from the Research Agendas will inform survey designs and will be addressed in the results of any reports.
- 3.3.2 The Regional Research Agenda relevant to the study area is the *South West Archaeological Research Framework* (<https://researchframeworks.org/swarf/>). The specific themes/questions within it are presented in Table 1.

Table 1: Themes/areas for future research from the Regional Research Agenda(s)

Research Agenda	Theme/Question
South West Research Framework	<i>Research Aim 23: Improve our understanding of past climate and sea level changes together with their effects on the peoples relationships with landscapes and the sea.</i> 23c: The continuation of the Palaeolithic and Mesolithic archaeology of the South West offshore highlights the need for topographic modelling, deposit and site prediction, and palaeoenvironmental reconstructions to be extended below the current tidal limits to improve understanding of the landscapes occupied by Upper Palaeolithic and Mesolithic populations. The marine archaeological resource has the potential to be particularly relevant to the issue of Upper Palaeolithic re-colonisation strategies (such as, how did modern humans reach the extreme west of the region?) 23e: In light of the importance of Mesolithic coastal strategies (as indicated by key midden sites such as Westward Ho!), the extant terrestrial resource should be integrated with the marine resource (such as submerged forest landscapes and artefact/ecofact material), especially in the west of the region. Particular focus should also be given to the palaeoenvironmental evidence for coastal management during the Mesolithic (such as reed beds management).
South West Research Framework	<i>Research Aim 37: Increase our knowledge of maritime archaeological sites.</i> 37a: Indirect evidence indicates that the seas around the region were busy with shipping in the past and this must have led to a large number of wrecks. However, many of these are likely to have been lost in waters that are not frequented by sport divers because of low visibility or high energy currents. How can we access this resource?
South West Research Framework	<i>Research Aim 47: Assess the archaeological potential for studying Medieval economy, trade, technology and production.</i> 47c: The importance of ports, harbours, coast and maritime archaeology develops in this period and much needs to be done to link this with more traditional rural studies and the Medieval market patterns of the South West.

3.3.3 The national research agenda for England's marine zone is *People and the Sea: A Maritime Archaeological Research Agenda for England* (Ransley 2013). Research priorities across different periods within this include:

- the impact of changing sea levels on populations;
- the need for more accurate targeted dating and environmental sampling for landscape reconstruction especially for early periods;
- gaining a deeper understanding of the relationship between ports and the hinterland;
- evidence for change over time related to the development of ports and harbours;
- Britain as a maritime power and its defence against invasion;
- development of an improved chrono-stratigraphic framework, for sets of deposits within clearly defined zones;
- investigation into potentially sealed sites that may contain a range of well-preserved palaeobotanical and biological remains, as these are generally rare;
- research for evidence for Roman ports and harbours, boats etc;
- collection of evidence for late medieval research on sea fishing, coastal fish weirs/traps;
- recording of river craft from the late medieval period;

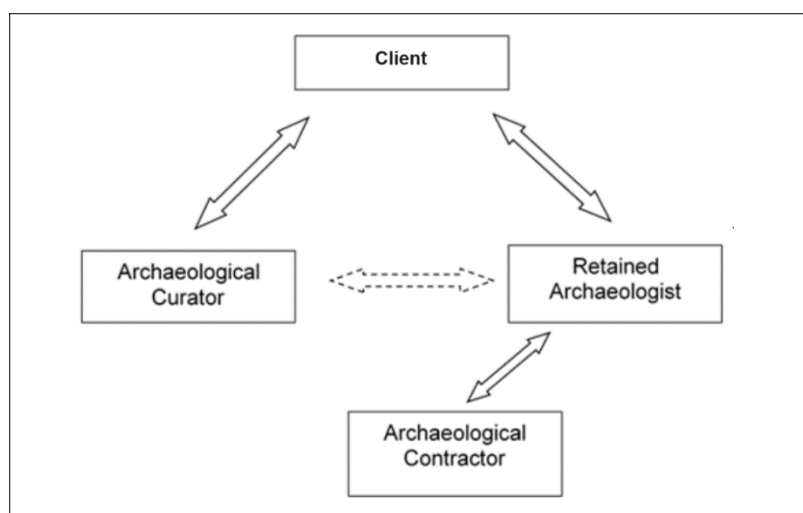
- the production of wooden ships, identification and study of shipwrecks and their cargoes, evidence for coastal trading, wharves and river transport;
- collect evidence for the development of national, regional and global maritime networks, including environmental evidence;
- 17th to 19th century military sites; and,
- First and Second World War defences, including the issues of continuity and re-use.

3.3.4 In general, more work is needed to produce further knowledge and chronologies about the individual research periods covering the Lower and Middle Palaeolithic, Palaeolithic and Mesolithic, Neolithic and Early Bronze Age, Late Bronze Age and Iron Age, late medieval, post-medieval, and modern periods.

4 ROLES, RESPONSIBILITIES AND COMMUNICATION

4.1.1 The Client will retain the services of a suitably qualified and experienced archaeological contractor (the Retained Archaeologist) to ensure the effective implementation of the WSI and other contractual commitments in relation to archaeology.

4.1.2 The following diagram shows the lines of communication between the Client, the Archaeological Curator(s) and the Retained Archaeologist/Archaeological Contractor:



4.1.3 Contact with the Archaeological Curator(s) will be administered by the Client, advised by the Retained Archaeologist. In relation to the implementation of the WSI the Retained Archaeologist will report to the Client's Project Manager. Interaction with the Client's contracted dredge team will be administered by the Client's Project Manager, advised by the Retained Archaeologist.

4.1.4 The Client's Project Manager will advise the Retained Archaeologist of their requirements or responsibilities under any Environmental Management Plan and the dredge method statement for the project.

4.1.5 Where method statements, reports, or other deliverables are submitted by the Client to the Archaeological Curator(s), their agreement / acceptance will be assumed if no contrary response is received within 30 working days of submission.



4.2 Schedule

- 4.2.1 Mitigation measures required to inform the final engineering design for this project must be undertaken, completed and reported on in time to inform the design.

4.3 Client

- 4.3.1 The Client will be responsible for implementing this WSI and the existing mitigation measures, such as AEZs.
- 4.3.2 The Client and/or their representative will commission a Retained Archaeologist.
- 4.3.3 The Client and/or their representative will consult the Retained Archaeologist during the planning stages for any further work.
- 4.3.4 The Client and/or their representative will commission Archaeological Method Statements prior to works being undertaken that may impact the seabed.
- 4.3.5 The Client and/ or their appointed representatives, or any archaeological body they may appoint to manage the implementation of the outline offshore archaeological WSI, will seek curatorial advice from the Archaeological Curator(s) as appropriate.
- 4.3.6 Interaction with the Archaeological Curator(s) will be administered by the Client and/or their appointed representatives with advice where appropriate through the Retained Archaeologist. If a new site of archaeological importance is discovered during works, the Archaeological Curator(s) will be contacted immediately.
- 4.3.7 The Client and/or their appointed representatives will be responsible for administering the obligations of the *Merchant Shipping Act* 1995 with specific regard to reports of wreck and salvage and will ensure that droit reports are dealt with accordingly (see **Section 10.6**). The Client and/or their appointed representatives will ensure that recovered material identified as 'wreck' must be reported to the Receiver of Wreck within 28 days of discovery. The Client and/or their representative will be responsible for the submission of this report, the legal obligations under the *Merchant Shipping Act* 1995 and all correspondence. If recovered material is held by the Retained Archaeologist, it is essential they are included in all correspondence with the Receiver of Wreck and are aware of any updates or changes to the reports (commonly known as droits) associated with the material. The Client and/or their appointed representatives will be responsible for ensuring the legal obligations associated with the droits are undertaken.
- 4.3.8 The Client and/or their representative will ensure that the Retained Archaeologist is provided with all relevant project datasets, to ensure that they are in an informed position to advise the Client. This is particularly important between the planning and construction phase, and at any stage if the Retained Archaeologist changes, to ensure consistency.
- 4.3.9 The Client and/ or their appointed representatives will ensure that Contractors make project personnel aware of this outline offshore archaeological WSI, any AEZs in force, and a bespoke Protocol for Archaeological Discoveries.

4.4 Retained Archaeologist

- 4.4.1 The Retained Archaeologist will oversee archaeological mitigation to provide consistency throughout the project, as required, and will implement the WSI.

- 4.4.2 The Retained Archaeologist will produce Archaeological Method Statements for works, as appropriate.
- 4.4.3 The Retained Archaeologist will act as the first contact for any unexpected archaeological discoveries. The Retained Archaeologist will cover the administration of the reporting of discoveries made by the Client and/or their representative and will provide immediate actions, including recording, handling and storage, and introduction of measures to prevent or reduce damage if the presence of a significant archaeological site is suspected. The Retained Archaeologist will ensure any unexpected discoveries of archaeological material are assessed, as per the protocol (see **Section 9.10**), and reported to the relevant curators and stakeholders. Recovered material identified as 'wreck' must be reported to the Receiver of Wreck by the Retained Archaeologist within 28 days of discovery. The Client and/or their representative will be involved with the submission of this report and all following correspondence.
- 4.5 Archaeological Curator(s)**
- 4.5.1 Method statements for archaeological works will be submitted to the Archaeological Curator(s) for comment/approval one month prior to the planned commencement of surveys/works, in order to allow for sufficient time for the review and any amendments to be completed and agreed.
- 4.6 Other Key Stakeholders**
- Receiver of Wreck*
- 4.6.1 Material identified as 'wreck' that has either been recovered within UK territorial waters or brought into UK territorial waters must be reported to the Receiver of Wreck under the *Merchant Shipping Act 1995*. The Receiver of Wreck is located within the Maritime Coastguard Agency and works with other government departments and heritage organisations.
- 4.6.2 Wreck material is reported to the Receiver of Wreck via their website: <https://www.gov.uk/report-wreck-material>
- 4.6.3 The Receiver of Wreck's contact details are as follows:
- Steve White, Maritime & Coastguard Agency, Spring Place, 105 Commercial Road, Southampton, SO15 1EG. Tel: 0203 817 2575. Email: row@mcga.gov.uk
- 4.6.4 Further details about how to manage discoveries of wreck material can be found in Section 11.6.
- Ministry of Defence*
- 4.6.5 Under the *Protection of Military Remains Act 1986*, any aircraft that crashed while in military service are automatically protected. Therefore, based on the precautionary principal, all finds or sites of aircraft should be reported to the Joint Casualty and Compassionate Centre (JCCC) of the Ministry of Defence (MoD), unless it can be proven without a doubt that the aircraft material is non-military. In any case, all finds of aircraft material should also be reported to the Receiver of Wreck.
- 4.6.6 Further details about how to manage discoveries of aircraft material, including restrictions, licensing, and guidance can be found in **Section 10.5**.

Harbour Master's jurisdiction

- 4.6.7 The *Harbours Act* 1964 enables a harbour authority to amend various statutory powers including the power to raise, remove, destroy and mark wreck to ensure safe navigation within, or in or near the approaches, a harbour. However, any removal of wreck still needs to be reported in line with the *Merchant Shipping Act* 1995.
- 4.6.8 Harbour authorities may have additional powers under other legislation, for instance Harbour Masters have powers under the *Harbour, Docks and Piers Clauses Act* 1847 where it has been incorporated into local harbour legislation. However, again the Receiver of Wreck should be contacted prior to any recovery or destruction of wreck.
- 4.6.9 Falmouth Docks and Engineering Company (FDEC), part of A&P Group, is the statutory harbour authority with responsibility for the area of water immediately surrounding Falmouth Docks. As they are the Client their contact details are not included here.
- 4.6.10 Falmouth Harbour Commissioners are the statutory harbour authority for the wider Falmouth Harbour around Falmouth Docks under the *Falmouth Harbour Act* 1958. Their contact details are as follows:
- Falmouth Harbour Commissioners, 44 Arwenack Street, Falmouth, TR11 3JQ. Tel: +44 (0)1326 213537. Email: info@falmouthharbour.co.uk

4.7 Archaeological Contractor(s)

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

4.8 UXO/ Seabed Clearance/Dredging Contractors

- 4.8.1 The contractors for the UXO surveys, seabed clearance and dredging works have, at time of writing, not been confirmed.
- 4.8.2 The key responsibilities of the UXO survey, seabed clearance and dredging contractors will include (and will be included within the main Contract document issued by the Client):
- notifying the Retained Archaeologist when UXO/seabed clearance/dredging works are to commence, giving enough warning so that the Retained Archaeologist can ensure the vessel staff/UXO specialists are aware of any specific considerations;
 - informing 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;
 - obeying legal obligations in respect of 'wreck' and 'treasure' under the *Merchant Shipping Act* 1995 and the *Treasure Act* 1996 respectively;
 - respecting any constraint maps, if applicable, or in place, including AEZs supplied by the Retained Archaeologist;



- notifying the Retained Archaeologist if an obstruction on the seabed is to be recovered. If the obstruction is identified as being of potential archaeological interest the dredging contractor will notify the Retained Archaeologist within 24 hours;
- allowing suitably trained and inducted Retained Archaeologist staff access to any barges containing recovered/dredged material as part of the archaeological watching brief (if backhoe dredging methodology to be used- see **Section 9.9**);
- provide suitable storage for recovered objects of potential archaeological interest either on the vessel or within a secured onshore compound, which may include wet storage depending on the nature of the recovered material;
- contacting the Retained Archaeologist in the event of a discovery identified as being of potentially high archaeological interest. The Retained Archaeologist will be notified as soon as possible after the discovery and within 24 hours of the discovery (see **Sections 9.10 and 9.11**); and,
- suspending work in a particular location if objects of potential archaeological interest are encountered. On receiving such a request, the UXO/seabed clearance/dredging contractor will immediately inform the Client's Project Manager verbally and will redeploy its equipment to work in an alternative location. The UXO/seabed clearance/dredging contractor will submit a Change Notification to the Client's Project Manager within 7 days.

4.9 Client Contractors

4.9.1 The responsibility for implementing the outline offshore archaeological WSI rests with the Client and their appointed representatives (including their Contractors).

4.9.2 All relevant Contractors engaged in the construction of the project shall:

- familiarise themselves with the requirements of the outline offshore archaeological WSI and make them available to all of their staff working on the project (e.g. for Protocol briefings and archaeological input into method statements);
- communicate with the Retained Archaeologist in the planning stages of any further survey work, to ensure archaeological objectives are included, as appropriate;
- implement a Protocol for Archaeological Discoveries through an agreed Site Champion (member of the construction/site crew) via the agreed Nominated Contact (see **Section 9.10**);
- obey legal obligations in respect of 'wreck' and 'treasure' under the *Merchant Shipping Act 1995* and the *Treasure Act 1996*, respectively;
- obey legal obligations in respect of *Protection of Military Remains Act 1986*.
- respect constraint maps and AEZs;
- assist and afford access to archaeologists employed by the Client; and
- 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.



5 ARCHAEOLOGICAL BASELINE SUMMARY

5.1 Introduction

- 5.1.1 The following section is a summary of the archaeological baseline presented in the site-specific desk-based assessment (Wessex Archaeology 2024a).

5.2 Previous impact

- 5.2.1 Falmouth has developed as a port since the 16th century, becoming the Royal Mail packet station connecting Britain with the wider world in 1688. Port infrastructure related to commercial and naval requirements continued to grow until the construction of Falmouth Docks in the late 1850s, which saw the excavation of graving docks and the reclamation of land from the sea to create docklands around them. The eastern breakwater was also constructed during this phase. Expansion in the early 20th century related to the repair of naval and merchant vessels damaged during WWI saw the construction of Queen's Wharf in 1918, with two wharfs, King's and Empire, being present running west from the western side of the wharf. Further expansion and reworking of the western wharfs occurred during the 1920s and 1930s (AC Archaeology 2013).
- 5.2.2 Extensive dredging was undertaken in the formation of Falmouth Docks in a tidal basin to the west of Bar Point; by 1860 a channel of deep water 300 ft wide had been dredged to connect the Docks with the deep water of Carrick Roads, followed by regular dredging in the later 19th and early 20th century (Cornwall Council 2008).
- 5.2.3 A chart dated 1936 shows that the area around Queen's Wharf and the Northern Arm was dredged to a depth of 5.8 m followed by regular maintenance dredging, although there is a lack of bathymetric data relating to dredging in the harbour (Cornwall Council 2008). Assessment of vibrocore data from the area does suggest that some areas within the vicinity of the wharfs, particularly to the north of Queen's Wharf, have not been impacted by previous dredging. Further dredging around the various pieces of port infrastructure continued throughout the 20th century to provide berth pockets and approach channels.
- 5.2.4 The project area has been extensively remodelled during the period of operation of Falmouth Docks, with the rebuilding of Queen's Wharf in steel following the timber jetty's destruction by fire in 2003. The new wharf was built over the same footprint of the old, with original piles and sub-sea structures remaining in place. The most recent work to the wharfs was the demolition of King's and Empire wharfs in 2007/8, the remains of which are listed as obstructions in the UKHO records (see below).
- 5.2.5 A review of previous impacts was undertaken by Cornwall Council (2008), who highlighted the impact of pollution incidents in 1991 associated with Wheal Jane mine, followed by a further release of millions of gallons of contaminated mine water from the Nangiles Adit, affecting the Carnon Valley, Restronguet Creek, Carrick Roads and Falmouth Bay.

5.3 Previous archaeological work

- 5.3.1 Extensive geophysical surveys (MBES, SSS, mag. and SBP) followed by ROV ground-truthing surveys were completed within the study area as part of the Falmouth Cruise project, which shared some of the same footprint as the proposed development (Cornwall Council 2008). The assessment of the SSS targets identified 117 targets with archaeological potential with 33 of these having mag. anomalies as well). The ground-truthing of 27 targets by ROV found that some of these were debris relating to the 20th century, mostly of low archaeological value. Sixteen targets were debris potentially of earlier date, of which four were identified as potential iron and wooden ship material. One of these

is within the limits of the current proposed development and has been included in the 2000s gazetteer presented on Figure 3.

- 5.3.2 Diver and geophysical surveys over the remains of King's and Empire Wharfs demonstrated that there were substantial quantities of debris and piles from the jetties, and it is likely that debris from the operation of these wharfs will also be within the vicinity (Sub Marine Services 2007; 2011).

5.4 Summary of known and potential archaeological assets

Intertidal / terrestrial

- 5.4.1 The terrestrial archaeological assets within the study area relate to the long-term use of the Pendennis peninsula as a dockyard and shipbuilding area, and to the defence of Falmouth during the last 500 years. Remains relating to the various shipyards, docks and associated trades such as foundries are all present along the north side of the Pendennis peninsula, with some remaining extant as upstanding buildings. Others, including much of the evidence for the Second World War defensive structures and embarkation points has either been buried beneath modern material or removed during the second half of the 20th century.
- 5.4.2 The known intertidal assets and potential for unknown heritage assets largely relate to material surviving from the earlier jetties and wharves present around the area of current wharf, in particular the original Queen's Wharf and the bases of King's and Empire Wharfs which extend through the intertidal zone into the marine zone. Associated maritime material related to the use of these wharfs e.g. anchors and other detritus has been noted to be present along the edges of the intertidal zone within this area.

Palaeogeographic Assessment

Sedimentary sequence and depositional environment

- 5.4.3 The sequence of superficial geological deposits recorded overlying the Porthscatho Formation bedrock, comprises Pleistocene slope deposits (Head) that is locally present towards the north-east and south-east, and a sequence of Holocene estuarine alluvium that is widespread across the proposed development. Both of these deposits have been impacted by previous dredging, reducing the level of the Head and Estuarine alluvium to a truncated level of c. -7 m CD, though dredge impacts appear to have been less severe towards the south-east of the proposed development (see below).
- 5.4.4 In a single borehole (WA-VC04) the alluvial sequence includes peat units at between -5.49 and -6.77 m CD. Geophysical assessment indicates that these deposits (Feature 7002) may be present more widely within the south-east of the proposed development. The peat deposits broadly coincide with a mapped palaeochannel feature (Feature 7001) identified in the geophysical data (**Figure 2**). There is tentative evidence in the vibrocores to suggest that the palaeochannel feature is cut into the underlying Head in the area of WA-VC21, indicating that the channel may be of Late Pleistocene or early Holocene date.
- 5.4.5 The basal Quaternary superficial geological deposits are Head deposits which are considered likely to have formed by a range of slope processes during the Pleistocene. Slope processes typically occur during periods when little vegetation is present, such as during glacial periods when landscapes are generally open. While these deposits are likely to be of Pleistocene date, they may contain finer-grained deposits associated with Holocene colluvium (slope-wash) sediments near the top of the sequence. These deposits also formed via slope processes, but are often associated with deforestation during the late Neolithic and Bronze Age. Increased deforestation can lead to increased slope instability, and the downslope movement of sediments.

- 5.4.6 Rising sea levels during the Holocene led to the widespread accumulation of estuarine alluvium, which is recorded here overlying the Head, or where that deposit is absent, the Portscatho Formation bedrock. The rate of sea level rise increased during the early Holocene, where river valleys, such as the Fal, were submerged. Sea level curves for south-west England show the highest rate of sea level rise during the Mesolithic (Heyworth and Kidson 1982; Haslett et al 1997; Haslett et al 2001; Massey et al 2008).
- 5.4.7 The localised peat deposits recorded within WA-VC04 reflect phases of reduced energy environments when semi-terrestrial plant communities became established. This typically occurs when the rate of relative sea level rise reduces, which would allow decomposed vegetation communities to accumulate at a rate faster than that of sea level rise, although such accumulation can also occur within abandoned channel features or backwater swamps. Features identified within the geophysical assessment provide further information on the distribution of the peat within the proposed development, beyond that in WA-VC04, and indicate that the peat may be associated with a former channel.
- 5.4.8 It is possible that the peat deposits encountered within the proposed development reflect an extension of the 'submerged forests' which are well reported from the Fal Estuary and surrounding location (e.g. Flett and Hill 1912; Leverage et al 1990; Kirkham et al 2005). Across Cornwall, these 'submerged forests' and associated palaeosols have yielded a range of radiocarbon dates, ranging from the Palaeolithic to Medieval. While none of the 'submerged forests' recorded in Falmouth have been dated, those from Maenporth which occur at -5.53 m OD have been dated to the Mesolithic. The sea level curves for south-west England (Heyworth and Kidson 1982; Haslett et al 1997; 2001; Massey et al 2008) suggest that the rate of sea level rise slowed down at points during the Mesolithic, although deposits located at the Prince of Wales Pier, c. 1.0 km west of the proposed development, were dated to the Late Neolithic (Wessex Archaeology 2023). However, these peat deposits were present at a higher elevation than the peat deposits encountered during this phase of work, so could represent different periods of peat formation.
- 5.4.9 The Marine Sands, located off the north-west of the proposed development, reflect higher energy conditions following sea level rise. Given the localised nature of these deposits within the site, they likely reflect the higher energy marine conditions observed in the main channel of the Fal estuary in the Late Holocene.

Palaeolandscapes

- 5.4.10 Geophysical assessment of the sub-bottom sedimentary profile allows conclusions about the geomorphology of past landscapes in the area surveys, and can reveal the location of features of this past landscape that may be of palaeoenvironmental value, or bear artifacts of archaeological importance. When used in conjunction with geoarchaeological interpretation of borehole data, further conclusions can be drawn – for example, it may be possible to map the full extent of a sediment of increased archaeological potential
- 5.4.11 Dredging has removed or disturbed much of the Holocene sediment for the area surveyed, obfuscating or preventing analysis of the palaeolandscape. This is most prominent in area to the north and the east of the wharfs. In the south-eastern area previous dredging has been less destructive, and, as such, some features and sedimentary structures have been retained, with two that may be of increased archaeological interest.
- 5.4.12 Feature 7001 is a broad (~150 m wide) channel of up to 7 m thickness, striking west-north-west to east-south-east and situated in the south-eastern survey areas. While the mapped extent shows a length of 302 m, it is very likely that this feature continues further south-east, though data availability within the confines of this study limits investigation. This

channel represents the high-energy erosional flow of water through a location. Two boreholes from within the feature boundaries (WA-VC21, WA-VC24) allow an insight into the sediments present, and into the archaeological potential of the unit. Infill is a layered accumulation of estuarine alluvium, and is not of inherent archaeological interest. WA-VC21 is through the northern flank of the channel, where erosion has cut into bedrock, again, with limited archaeological potential displayed. Along the southern flank, intersected by WA-VC24, the erosional surface of the channel exposes the Palaeolithic Head sedimentary unit. As such, this may increase the potential for the inclusion of Palaeolithic artefacts as reworked material in basal channel infill.

- 5.4.13 Feature 7002 is a peat body stratigraphically above the southern flank of channel 7001. Peat was identified within borehole WA-VC04, and is of significant archaeological importance. Within the core, peat was interspersed with estuarine alluvium at a scale too small for data resolution to display. However, the instance of this repeating peat-alluvium sequence within WA-VC04 intersects a small but discrete feature. This feature can be traced over 14 seismic lines, is 150 x 40 metre in area, and is ~1.5m thick in places. While there is the potential for the peat to be of limited extent within this feature, the presence of such material is of high archaeological importance.
- 5.4.14 7001 and 7002 appear to share a spatial relationship, with peat bed 7002 exhibiting a linear form that broadly traces the southern flank of channel 7001. This may suggest that 7002 was formed at the southern bank of channel 7001 in the later stages of formation, with 7002 representing a wetland environment on the fringe. The repeated peat-estuarine alluvium sequence may therefore represent a variable rate of flow through the channel, with instances of estuarine alluvium representing a transgression onto the wetland, and peat representing a reduced fluid load, allowing vegetation to grow and peat formation to occur. Without additional seismic data and a more targeted geoarchaeological investigation, a high-confidence conclusion regarding this relationship cannot be drawn, and the area surveyed may be an isolated instance where these two features spatially overlap.

Previous Dredging

- 5.4.15 Past dredging and dock activities within the proposed development have impacted upon the Quaternary superficial deposits, including both the Holocene alluvium and Pleistocene Head. The depth of impact of previous dredging varies, but it appears to be greater in the north-west of the proposed development, and in places the sequence is capped by modern made ground (see below). Both the results of the borehole survey and geophysical assessment indicate that in the area of the Docks Basin previous dredging has been less destructive, and, as such, some features and sedimentary structures have been retained, with two that may be of increased archaeological interest (Features 7001 and 7002).
- 5.4.16 The surface of the modern sediment recorded during the borehole survey shows evidence of the seabed shoaling to the south of the proposed development, away from the previous areas of dredging at the Queen's and Northern wharfs. Where previous dredging intervals around the Queen's and Northern Wharfs have been more prevalent, seabed levels were lowest, being c. -7.0 to -8.0 m CD.
- 5.4.17 Previous dredging activity has largely impacted Holocene sediments across the proposed development, with seabed sediments and made ground typically overlying a truncated sequence of estuarine alluvium. Locally previous dredging activity may have impacted on peat deposits, as organic-rich seabed sediments overlay Holocene peat deposits in WA-VC04. Where deeper dredging activity has occurred around the Queen's and Northern Wharf, the dredging has impacted deeper, and within WA-VC08 the surfaces of the Pleistocene Head deposits have been impacted by previous dredging.

Palaeogeographic potential

5.4.18 The archaeological potential of deposits is summarised in **Table 4** and discussed below.

Table 1 Archaeological potential

Lithostratigraphic unit	Geological Period	Archaeological Period	Depth m bgl	Depth m CD	Geoarchaeological potential	Archaeological Significance
Head	Pleistocene	Palaeolithic?	0.08-4.00	-6.77 – -9.24	Moderate	Low
Estuarine Alluvium	Holocene	Unknown	0.00-5.60	-5.22 – -17.26	Moderate	Low
Peat	Holocene	Unknown	0.70-1.98	-5.49 – -6.77	High	Unknown
Marine Sands	Holocene	Unknown			Low	Unknown

Head

5.4.19 Pleistocene Head can contain reworked archaeological artefacts of Palaeolithic date, as well as mask soil horizons or *in situ* archaeology. While the age of the Head is not fully understood, the deposits may be associated with the Devensian glaciation and may therefore be of Middle to Upper Palaeolithic date.

5.4.20 Human occupation during the Palaeolithic in Cornwall is poorly understood, with very little evidence recorded from the region, although occasional flint lithics from the region do occur, they are often with little lithological context. While they may be associated with river terraces (Hosfield et al 2006), there is little evidence for lithics from within the terraces associated with the rivers which feed into the Fal Estuary. However, this paucity of records could reflect the lack of extant river terrace gravels within Cornwall, and the lack of a history of gravel mining in the area, when compared to that of south-east England.

5.4.21 The surface of the Head deposits has potential to contain *in situ* archaeology, while the body of the Head has low potential to contain *in situ* and/or reworked archaeology. Coastal inundation and flooding during Holocene sea level rise may have preserved prehistoric archaeology on the surface of these deposits.

Estuarine Alluvium

5.4.22 The Estuarine Alluvium within the proposed development is of Holocene date, associated with sea level rise and rising base levels in the Fal Estuary from the Mesolithic onwards. While north and west Cornwall has widespread evidence of human occupation during the Mesolithic, in southern Cornwall between the Helford and Tamar rivers, including the Fal Estuary, there is little Mesolithic evidence (Berridge and Roberts 1986). Evidence becomes more frequent into the Neolithic and Bronze Age, which includes finds in close proximity to the Fal Estuary, such as a jade handaxe recovered from Falmouth (Campbell-Smith 1963).

5.4.23 This unit is likely to have formed in the intertidal zone, within estuarine mudflats or saltmarsh under the influence of relative sea level rise during the Holocene. This unit is considered to be of low palaeoenvironmental potential on the basis of the minerogenic nature of the alluvium, and the likely reworked nature of any contained organic material. This unit is however considered to be of moderate archaeological potential on the basis of the likely intertidal environments in which they formed, with the potential for well-preserved archaeology including (for example) wooden boats, fish traps and shipwrecks.

Peat

- 5.4.24 The age of the peat deposits within the proposed development is uncertain, but is likely to be of Mesolithic date onwards and they would have accumulated during a period of significant human occupation in the region. These semi-terrestrial plant communities would be attractive to a host of wildlife (e.g. wildfowl, grazers, browsers) which may have provided subsistence to local human communities in the region, and may have attracted humans to the area.
- 5.4.25 Peat deposits typically have high geoarchaeological potential to contain material suitable for radiocarbon dating, and palaeoenvironmental proxies (e.g. pollen), which can provide information on past climate, vegetation and land use.

Marine Sands

- 5.4.26 The Marine Sands deposited within the proposed development overlie Estuarine Alluvium, and are likely to have been deposited during the Late Holocene, following high rates of sea level rise from the Bronze Age onwards. These deposits are coarse-grained and reflect deposition in a high energy environment.
- 5.4.27 While these deposits are deposited during an interval of human occupation in the region, the high energy environment would likely result in reworking or abrasion of any archaeological artefacts or palaeoenvironmental indicators, which would limit the potential of the deposits.

Known maritime

- 5.4.28 There are currently no sites within the study area that are subject to statutory protection from the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1979; the three legislative acts that could be used to protect marine archaeological sites.
- 5.4.29 There are four known wrecks within the study area, two of which are listed as 'Live', one as 'Dead' and one which is likely to have been lifted. Despite the listing of 'dead' or 'lifted' there may still be material relating to these wrecks on the seabed. An additional wreck was identified close to the two known 'Live' wrecks from an MBES survey of the wrecks. It is likely that this and one of the known wrecks nearby relate to mooring barges constructed in the 1980s. Ground-truthing of geophysical anomalies as part of the Falmouth Cruise Project in 2007/8 identified an anchor and length of chain north of the Northern Arm.
- 5.4.30 Two known obstructions are present within the study area, which relate to the former King's and Empire Wharfs, demolished in 2008.

Known aviation

- 5.4.31 There is a single recorded loss recorded within the search area. This is a Junkers Ju 88A-5 lost in 1941 after hitting a balloon cable. The Ju 88A-5 was a German twin engine medium bomber that was used extensively during the Battle of Britain.

Maritime and aviation archaeological potential

Maritime potential

- 5.4.32 There is potential for archaeological material relating to maritime movement dating back to at least the neolithic, with logboats known to have been in use in Britain from this period. During later prehistory the area was a hub for the extraction and trade in tin, with this material being traded as far as the Mediterranean, and coastal movement including

probable cross-channel crossings have been demonstrated through discoveries such as the Dover Bronze Age boat.

- 5.4.33 As noted in the palaeogeography section there is also potential for submerged landscapes from early prehistory within undisturbed areas of the seabed, and these have been mapped through the combination of the geoarchaeological assessment and the SBP datasets.
- 5.4.34 The Fal estuary as a secure deepwater anchorage would have been an advantageous location for shipping from the Roman period onwards, with trading and war ships being present within the English Channel throughout. The development of the port of Penryn in the medieval period means that ships would have been traversing through the Fal estuary in increasing numbers, including both smaller fishing and coasting vessels as well as the gradual development of larger ocean-going ships. The defence of this anchorage can be seen in the building of the Device Forts in the 1540s. Through the post-medieval period the area was an important naval base, as well as being the base of the Falmouth packets which delivered news and communications around the globe. The development of Falmouth as an important port and dockyard during the 19th century maintained the maritime significance of the area, with extensive import and export facilities as well as shipbuilding and ship repair facilities. Falmouth was a significant maritime asset during the First and Second World Wars, with large quantities of shipping passing through, both military and civilian.

Aviation potential

- 5.4.35 The south-coast of England has seen considerable aviation of activity over the last century. Crash sites, debris and associated material have entered into the archaeological record, particularly from actions taking place during the two World Wars, as well as civilian aviation activity through from the early 20th century, becoming more common during the late 20th century. As the area is within the inner Fal estuary and close to a large centre of population it is considered unlikely that any further aircraft crash in the area would not have been reported, and so picked up during the desktop study. The potential for aviation archaeology is therefore highest relating to the Ju 88 medium bomber identified as a Recorded Loss somewhere within the wider Search Area around the site.

6 POTENTIAL IMPACTS

6.1 Direct

- 6.1.1 Archaeological receptors may be buried within seabed sediments, particularly preserved within the finer-grained sediments of the riverbed, or may rest upon the seafloor, either with or without height. As such, direct impacts to these receptors can occur during any development or related activity that contacts the sea floor or cuts through seabed deposits. Archaeological receptors with height, such as wrecks, may also be impacted by development or activities that occur within the water column (discussed below); these seabed morphologies may offer increased preservation potential for unknown cultural heritage receptors.
- 6.1.2 Construction activities have the potential to have the following direct impact; listed below along with an indication of the effect on the receptor:
- Dredging of riverbed sediments, removing either archaeological material or the supporting sediment around archaeological material; and
 - Removal, repair and rebuilding of Queen's Jetty, Western Wharf and Northern Arm leading to direct physical damage to archaeological material or supporting

sediments around archaeological material e.g. through piling activities or through land reclamation.

6.1.3 Operational activities have the potential to have the following direct impacts, which are listed below along with an indication of the effect on the receptor:

- Maintenance dredging of riverbed sediments following build up removing archaeological material which has been redeposited in the sediments from elsewhere.

6.1.4 The proposed methodology of dredging, whilst having a potentially significant direct impact on any archaeological receptors on the riverbed, also has an impact on the mitigation proposed, and the ability of archaeologist to monitor the arisings.

6.1.5 The methodology and extent of repair works being proposed to Queen's Wharf, Western Wharf and Northern Arm will need to be considered so as to include mitigation against damage to archaeological material and afford the retained archaeologist the ability to monitor the works.

6.1.6 Due to the fragile and non-renewable nature of the marine archaeological receptors on and/or under the seabed, any direct impacts have the potential to be permanent and negative. Appropriate mitigation is necessary to reduce this.

6.2 Indirect

6.2.1 Potential indirect impacts arise when direct impacts have effects beyond their primary footprint and can affect archaeological sites or material some distance away. Indirect impacts can include changes to erosion patterns, sediment transport, currents, and water quality during installation, caused by the direct impacts listed above. In general, archaeological receptors exposed to marine processes will deteriorate faster than those buried within seabed sediments. Aspects of the project works that result in increased sediment cover may afford additional protection to archaeological receptors, thereby causing a positive beneficial effect.

6.2.2 However, aspects of the proposed dredging area that result in increased scouring or removal of sediment cover may expose previously buried receptors thereby increasing the rate of deterioration.

6.2.3 The changes to the hydrodynamic and sedimentary regimes due to spoil removal and distribution caused by dredging operations may lead to increased protection to, or deterioration through erosion of, receptors resulting in a positive or negative effect on receptors in the vicinity.

6.2.4 However, any significant indirect impacts are expected to be limited to their immediate vicinity, and therefore no mitigation is recommended for indirect impacts.

7 MITIGATION

7.1 Introduction

7.1.1 The following mitigation has been designed to mitigate the identified potential impacts discussed in **Section 6** above. It involves a range of investigations proportionate to the identified significance of known receptors; where significance is unknown a precautionary approach of assuming high significance is required due to the finite nature of the

archaeological resource. Some of the mitigation measures below have been designed to ascertain the significance of known receptors and adequately record them in line with this.

7.2 Proposed Mitigation

7.2.1 The proposed measures are designed to mitigate against the impact the proposed work has on any sites with known or unknown archaeological potential:

- no Archaeological Exclusion Zones (AEZs) have been recommended at this time (see **Section 9.3**), however temporary AEZs could be implemented if material of archaeological interest is identified during further surveys or works;
- Assessment level (1b) recording (see **Appendix 7**) of the extant wreck **2003** along the eastern side of the Western Wharf prior to any construction, demolition or dredging works beginning;
- Recovery and recording of the anchors identified during the walkover along the western side of the Western Wharf;
- the implementation of an Archaeological Watching Brief during clearance and/or pUXO investigation works (see **Section 9.6**), and during the periods of the capital dredging phase where works are located within the areas of the former King's and Empire Wharfs and the areas of geoarchaeological features **7001** and **7002** (see **Section 9.9**);
- if required, an archaeological diver/ROV survey as part of the archaeological watching brief to further investigate any targets of archaeological potential that are identified during the pUXO investigation stage (see **Section 9.6**); and,
- the implementation of a bespoke Protocol (see **Section 9.10**) with awareness training (see **Section 9.11**) during UXO/seabed clearance/dredging operations to ensure that any archaeological finds are reported via the Retained Archaeologist to Historic England and the Cornwall Historic Environment Record (HER).

7.3 Unexpected discoveries

7.3.1 Unexpected discoveries should be reported through a bespoke archaeological protocol (**Section 9.10**) alongside awareness training (**Section 9.11**).

7.4 Palaeogeographic assessment

7.4.1 Initial geoarchaeological monitoring of the proposed dredging area has been carried out (Stages 1 and 2 of Table 3), with the results summarised in **Section 5.4**. Further requirements have been set out in the geoarchaeological report (Wessex Archaeology 2024b) and are summarised in **Section 9.5**

7.4.2 Should peat be encountered during further surveys or dredging/construction activities, it should be recovered, sampled and archaeologically assessed in line with the approach laid out in Table 2.

Table 2: Staged approach to geoarchaeological investigations

Stage 1: Geoarchaeological Desk-based Assessment (GDBA) and deposit modelling	A Geoarchaeological Desk-Based Assessment (GDBA) examines a range of data (published and unpublished ("grey literature"), LiDAR, historic maps) and models existing Ground Investigation (GI) data to inform on the possible Palaeolithic archaeological and geoarchaeological potential of a site. The GDBA may include, dependant on the site and complexity of a site, a Geoarchaeological Deposit Model which demonstrates the vertical and lateral extent of superficial deposits across the site. The GDBA establishes the requirements for and scope of Stage 2 archaeological and geoarchaeological field elevation. Geoarchaeological potential is defined as potential for paleoenvironmental and dating evidence. Should Stage 2 evaluation be required, appropriate and proportionate recommendations for the site are provided.
Stage 2: Geoarchaeological monitoring of GI works and/or Geoarchaeological borehole survey	Field evaluation to establish the geoarchaeological and archaeological potential of Quaternary deposits within an evaluation area, which informs on the requirements and scope of further works at Stage 2 (e.g. purposive borehole survey), Stage 3 palaeoenvironmental assessment and/or Stage 4 mitigation. The principal methods of geoarchaeological evaluation are through monitoring of Ground Investigation (GI) works or targeted boreholes. A geoarchaeological evaluation report is produced, which includes deposit modelling (where sufficient data allows) and recommendations for further work at Stage 2 or Stage 3 if required. Further works may include additional interventions (stepped trenches, test pits or boreholes) to retain additional/suitable samples for assessment.
Stage 3: Palaeoenvironmental assessment	Palaeoenvironmental samples recovered during Stage 2 are assessed to inform on the archaeological and geoarchaeological potential of deposits and guide the scope and need for Stage 4 analysis. A report is produced outlining the palaeoenvironmental potential of the deposits including targeted and proportionate recommendations for Stage 4 analysis.
Stage 4: Palaeoenvironmental analysis	Based on the results of the Stage 3 palaeoenvironmental assessment, palaeoenvironmental analysis on selected deposits/samples may be required. In addition to full analysis of suitable samples identified during the assessment, work at Stage 4 may include additional scientific dating where appropriate/required. A final analysis report is provided on completion of mitigation program. Where appropriate, this may include recommendations for publication or other forms of dissemination.
Publication	The scope and location of a publication report will be agreed in consultation with the client and LPA advisor. The publication report may comprise a note in a local journal or a larger publication article or monograph, dependant on the significance of the archaeological and geoarchaeological work.

8 METHOD STATEMENTS

- 8.1.1 This WSI provides a framework for further archaeological investigations for Falmouth Docks Development. All works will be undertaken in accordance with the methodology set out within this WSI and in compliance with the standards outlined by the ClfA (ClfA 2017; 2020 a – c; 2023 a; b), excepting where they are superseded by statements made below.

- 8.1.2 Detailed method statements will be produced, as required, for further archaeological works, such as those identified in the 'Scheme of Investigations' section, below.
- 8.1.3 Each archaeological method statement will correspond to a package of works, for example, archaeological assessment of marine geophysical data, archaeological assessment of ROV data from the UXO survey, and archaeological investigation using divers and/or ROVs.
- 8.1.4 Method statements will provide details about:
- Form of commission and contractual relationship with the Client;
 - Relation between the method statement, the WSI and the license condition(s);
 - Context in terms of relevant construction works;
 - Specific objectives of archaeological works;
 - Extent of investigation;
 - Investigation methodology
 - Anticipated post-investigation actions, including processing, assessment and analysis of finds and samples;
 - Reporting;
 - Timetable;
 - Monitoring arrangements; and
 - Health, safety and welfare.
- 8.1.5 Method statements will be provided to the Client for comment. On receipt of comments from the Client, the Retained Archaeologist will produce a final method statement addressing these comments.
- 8.1.6 Method statements will be submitted to the Archaeological Curator(s) for approval and will include provision for the relevant Archaeological Curator(s) to monitor the progress of the archaeological works, as appropriate, be that through site visits or meetings with the Client, the Contractor(s), and the Retained Archaeologist.

9 SCHEME OF INVESTIGATIONS

9.1 Introduction

- 9.1.1 The following schemes of investigations provide a framework for the implementation of any additional mitigation that may be required in response to any unexpected discoveries during the different phases of the project, based on the referenced guidance indicated below.
- 9.1.2 The Mitigation section (**Section 7**) provided a brief overview of the types of further archaeological investigations recommended for identified High, Medium, and Low archaeological receptors, unknown, and riverbed prehistory and other archaeological receptors (Wessex Archaeology 2024). The Scheme of Investigations section sets out how these investigations will be undertaken.
- 9.1.3 The Retained Archaeologist will provide input on the contractors' proposed survey method statements to ensure data collection is optimised so that it can be used to identify features of archaeological importance and inform mitigation proposals such as avoidance of wrecks and wreck debris.

9.2 Standards and guidance

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

- *Code for Practice for Seabed Development* (Joint Nautical Archaeology Policy Committee (JNAPC) 2006);
- *The Assessment and Management of Marine Archaeology in Port and Harbour Development* (Historic England 2016);
- *Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest*, Guidance Document No 124-2014 (PIANC 2014);
- *Standard and guidance for nautical archaeological recording and reconstruction* (CIfA, 2020b)
- *Universal guidance for archaeological monitoring and recording* (CIfA, 2023a);
- *Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers* (English Heritage, 1998);
- *Curating the Palaeolithic* (Historic England, 2023);
- *Military Aircraft Crash Sites: Guidance on their Significance and Future Management* (English Heritage, 2002);
- *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (English Heritage, 2008);
- *Ships and Boats: Prehistory to Present – Designation Selection Guide* (Historic England, 2012);
- *Marine Geophysics Data Acquisition, Processing, and Interpretation Guidance Notes* (English Heritage, 2013);
- *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record* (English Heritage 2015d);
- *Preserving Archaeological Remains: Decision-taking for Sites under Development* (Historic England, 2016); and
- *Our Seas – A Shared Resource: High Level Marine Objectives* (Department for Environment, Food and Rural Affairs (DEFRA), 2009).

9.3 Archaeological exclusion zones

9.3.1 No archaeological exclusions zones (AEZ) have been implemented at this time.

9.3.2 In the case of high importance finds or finds thought to be of high importance a temporary 50 m AEZ dependant on the operation in action will be implemented until consultation with the Retained Archaeologist and Historic England have occurred, and appropriate mitigation has been agreed.

9.4 Marine geophysical investigations

9.4.1 No further marine geophysical investigations are planned prior to the start of demolition, dredging and construction. In the event that further work is recommended by the Retained Archaeologist, the Historic England Science Advisor must be contacted to discuss the scope and evidential value of such works. This is to ensure that the extent, coverage and

line spacing of geophysical survey data, and their associated capabilities and limitations, can be weighed against the potential for archaeological remains.

- 9.4.2 For all aspects of marine geophysical investigations, the Client will adhere to applicable standards and guidance.
- 9.4.3 For bathymetry data gathered and assessed for non-archaeological purposes (for example as part of a UXO survey or boulder/obstruction clearance), the raw bathymetry data must be retained and made accessible to the Retained Archaeologist, should anomalies subsequently be determined to be of archaeological interest.

9.5 Marine geoarchaeological investigations

- 9.5.1 The borehole survey has demonstrated that Pleistocene and Holocene deposits with archaeological and geoarchaeological potential occur within the site. These consist of Peat deposits of Holocene age and Head deposits of probable Pleistocene age.
- 9.5.2 A programme of Stage 3 (see Table 3 above) palaeoenvironmental assessment on boreholes WA-VC04 is recommended. Specific recommendations are provided in **Table 4**. It is recommended that radiocarbon dating of the peat deposits should be undertaken. This would comprise the dating of the initiation of peat formation across the proposed development, and the final interval of peat formation within the proposed development.

Table 3: Palaeoenvironmental assessment recommendations

Borehole	Unit	Depth from (mbsf)	Depth to (mbsf)	Pollen	Diatoms	Plant macroremains	Radiocarbon dating
WA-VC04	Peat	0.70	0.92	2		2	1
	Void	0.92	1.17				
	Estuarine Alluvium	1.17	1.40		2		
	Peat	1.40	1.50	2		2	1
	Estuarine Alluvium	1.50	1.56		1		
	Peat	1.56	1.61	1		2	
	Estuarine Alluvium	1.61	1.80		2		
	Peat	1.80	1.98	2		2	1
Total samples				7	5	8	3

- 9.5.3 The development proposals are also likely to impact on and the two identified palaeolandscape features **7001** and **7002** which have the potential to preserve archaeological or palaeoenvironmental evidence. It is recommended that during dredging works which will impact upon these features in the south-east of the proposed development, an archaeological watching brief is undertaken. This is included in **Section 9.8**.
- 9.5.4 In the event that further work is recommended by the Retained Archaeologist, the Historic England Science Advisor must be contacted to discuss the scope and evidential value of such works.
- 9.5.5 Historic England has recommended the acquisition of dedicated archaeological cores. However, the Retained Archaeologist will work with, and communicate early on with, the Geotechnical Contractor to ensure that should any cores of archaeological potential be

required for other assessment, that they will undergo archaeological assessment first. This process will be recorded in the method statement.

9.5.6 Method statements will include clear provisions for the development of a collection, retention and storage strategy for cores, to allow for analysis to take place. It will be recommended for cores to be collected using light-proof sleeves, and that cores must be stored and split under light-safe (dark) laboratory conditions, in order to promote the preservation of the integrity of deposits of a certain age.

9.5.7 If boreholes and/or vibrocores are going to be assessed on-board the survey vessel, Historic England has advised that consideration be made for an archaeologist to be on-board during the geotechnical survey. If geotechnical material will not be assessed on-board, but rather be recovered to lab facilities for assessment on shore, the presence of an archaeologist on-board during acquisition would not be required, however an archaeologist should be present in the lab when the cores are split.

9.6 Archaeological recording of wreck 2003 along eastern side of the Western Wharf

9.6.1 The three wrecks along the eastern side of the Western Wharf have been identified through rapid assessment of bathymetry data for the area, with two of them already having UKHO records. These vessels are all noted to have been deliberately sunk during the 20th century, with two anecdotally identified as mooring barges built in the 1980s for the docks. These do not require any further recording. The third wreck, **2003**, is of a different form and may date to the period prior to D-Day as it has similarities to concrete water barges built for this event.. A 1b assessment level record of it, as set out in Appendix 7, is recommended to confirm this.

9.6.2 The use of an ROV, deployed and piloted either from the wharf or from a vessel is recommended to be the most effective way to record wreck **2003** to the level required, prior to any demolition, construction or dredging works in the area. As well as being the safest approach, an ROV is a stable survey platform and will be able to achieve the survey tasks required, although the ROV will not be able to physically examine objects or cut away marine growth for visual inspection. This would be equipped with suitable video cameras, lighting and sonar as required, the exact specifications of which would be set out in a Method Statement.

9.6.3 The recording archaeologist will assess the significance of the material of the wreck, in line with relevant guidance, such as:

- Conservation Principles: Policies and Guidance: for the sustainable management of the historic environment (English Heritage 2008);
- Managing Significance in Decision-Taking in the Historic Environment: historic Environment Good Practice Advice in Planning: 2 (Historic England 2015);
- Ships and Boats: Prehistory to Present: Designation Selection Guide (Historic England 2017),
- Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (English Heritage 2002); and
- Historic Military Aviation Sites: Conservation guidance (Historic England 2016).

9.6.4 The results of the assessment of the wreck will be captured in the project database. An archaeological TIR (as discussed above) will also be produced for the wreck, and a report into the survey will be completed as part of the overall reporting into the mitigation works.

9.7 Recovery and recording of identified archaeological receptors: anchors

- 9.7.1 This work is recommended to take place as part of the UXO survey/seabed clearance works, and so will use the same methodology as set out in **Section 9.6**.

9.8 Archaeological Watching Briefs: during UXO survey and/or seabed clearance

- 9.8.1 An Archaeological Watching Brief is recommended to be undertaken during the UXO survey and/or seabed clearance works, to confirm whether targets are of archaeological interest. There is no way of determining if a UXO target is archaeological until it has been investigated and so it is recommended that this work is completed as a watching brief. To make this assessment an archaeologist may be either embedded into the UXO dive team or onboard the vessel to provide specialist assistance in determining the archaeological potential of targets. If a bespoke archaeological diver/ROV survey is required outside of the UXO survey this will use the same methodology as below.
- 9.8.2 While investigating each site, the archaeologist on board will liaise with the dive supervisor and will oversee the capture stills and video of each site in order to support the site interpretation. Images will provide sufficient information to illustrate the site/object and will capture any features of particular interest. The images will be used for the production of an archaeological Target Investigation Report (TIR) for each target of archaeological interest. The stills and video may also be required if interpretation from external specialists or Historic England is required.
- 9.8.3 The archaeologist on board will assess the significance of the material, in line with relevant guidance, such as:
- Conservation Principles: Policies and Guidance: for the sustainable management of the historic environment (English Heritage 2008);
 - Managing Significance in Decision-Taking in the Historic Environment: historic Environment Good Practice Advice in Planning: 2 (Historic England 2015);
 - Ships and Boats: Prehistory to Present: Designation Selection Guide (Historic England 2017),
 - Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (English Heritage 2002); and
 - Historic Military Aviation Sites: Conservation guidance (Historic England 2016).
- 9.8.4 The results of the assessment of each site will be captured in the project database. An archaeological TIR (as discussed above) will also be produced for each site of archaeological interest.
- 9.8.5 Should sites of archaeological significance be discovered, the archaeologist on board will liaise with the UXO contractor and with the Retained Archaeologist. The Retained Archaeologist will then liaise with the Client and Historic England to determine requirements for further mitigation. Table 4 below sets out the responses for the different potential finds that might be encountered during this work, with the actions, responsibilities, and lines of communication to be implemented.
- 9.8.6 It may not be possible to establish the archaeological significance of all targets during the initial survey. In these cases, further archaeological assessment and desk-based research will be undertaken onshore by the Retained Archaeologist.

Table 4: Recommended archaeological mitigation of targets

Target	Action	Company	Responsibilities / Lines of communications
Modern Debris	- Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. - Not of archaeological significance, no further action required.	UXO Contractor Archaeological Contractor	Archaeological Contractor Dive Supervisor (DS)
UXO	- Dive Supervisor to implement UXO policy. - Archaeological Contractor to record items as UXO on TIR.	UXO Contractor Archaeological Contractor	UAV pilot Vessel Captain Archaeological Contractor to fill in basic TIR with available information to inform Archaeological Curator
Wooden Wreck	- Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. - Archaeological Diver will be deployed to further survey the site, and to gain additional detail to characterize the material on the site. - Archaeological Contractor to confirm initial assessment or request research assistance, or instruction for further action, and discuss findings with Archaeological Curator. - Precautionary AEZ implemented, to be confirmed through discussions with Archaeological Curator.	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to inform Client and discuss with Archaeological Curator.
Anchors	- Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. - Should the anchor be an isolated discovery, Archaeological Contractor will be present to supervise recovery. - Should the anchor be associated with additional wreck material, the Archaeological Contractor will implement precautionary AEZ and discuss the findings with the Client and the Archaeological Curator.	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to inform Client and confirm mitigation with Archaeological Curator.
Aircraft material	Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR.	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to inform Client at first opportunity.



Target	Action	Company	Responsibilities / Lines of communications
	• However, if a site is identified as an aircraft, no further excavation will be undertaken, as a licence for excavation would be required under the Protection of Military Remains Act 1986. • Archaeological Contractor to inform Client at first opportunity and will confirm initial assessment and/or request research assistance. • Archaeological Diver could be deployed for further survey and to gather additional information from the target, to determine the character of the site. • Archaeological Contractor to implement precautionary AEZ. • Archaeological Contractor to confirm with Archaeological Curator and MoD regarding decision on AEZ and receive advice on any further action.		Archaeological Contractor will liaise with the Archaeological Curator and the MoD regarding next steps.
Fragile archaeological objects	• Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. • Archaeological Contractor to inform Client at first opportunity. • Archaeological Contractor to implement precautionary AEZ for items considered to be of archaeological significance in-situ. • Archaeological Contractor to ensure Archaeological Diver is involved in survey of fragile objects and that an archaeologist is present on board for their recovery.	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to inform Client, and to develop method plan for Archaeological Diver survey of artefacts and recovery with Archaeologist on board.
Isolated objects	• Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. • Archaeological Contractor to be present when material is recovered on board, should it require additional recording. The Archaeological Contractor will advise on first aid conservation for recovered finds, and should they be of archaeological significance, the Archaeological Contractor will	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to liaise with Archaeological Curator should material of archaeological significance be recovered.

Target	Action	Company	Responsibilities / Lines of communications
	liaise with the Archaeological Curator.		
Unidentifiable objects	- Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. - Not of archaeological significance, no further action required.	UXO Contractor Archaeological Contractor	Dive Supervisor Archaeological Contractor to liaise with Archaeological Curator should material of archaeological significance be recovered.
Target not found	- Archaeological Contractor to confirm sufficient data gathered or advise Dive Supervisor to ensure adequate data collection occurs to inform TIR. - Not of archaeological significance, no further action required.	UXO Contractor Archaeological Contractor	Dive Supervisor

9.9 Archaeological Watching Briefs: Dredging

9.9.1 A Watching Brief is recommended to monitor the dredging work within areas/depths below CD where previous studies suggest buried archaeological deposits may be present:

- the area within and immediately around the footprint of the former King's and Empire Wharfs; and
- the area of features 7001 and 7002 identified in the geophysical assessment.

9.9.2 This work would be located on the dredger itself, or if safe to do so, on the spoil barges used to hold excavated material, depending on access. Watching Brief areas based on a 10 m buffer around the UKHO charted areas of the remains of the two jetties and the area of likely Head deposits are presented in **Figure 5**.

9.9.3 A method statement will be developed to include archaeological monitoring on board the dredger or spoil barges, and should any material be recovered, it will be analysed and recorded according to the principles set out in **Sections 10 and 11**.

9.9.4 Recovery of any archaeological material during the Watching Brief will be completed under the supervision of the Retained Archaeologist, with any artefacts or structural fragments returned to the quayside for appropriate archaeological storage (see **Section 11**)

9.9.5 For all aspects of Archaeological Watching Briefs on board, the Client and the Retained Archaeologist will adhere to standards and guidance as set out in ClfA 2023a, PIANC 2014 and Historic England 2016b.

9.9.6 Should archaeological features or structures that are encountered on the seabed merit further investigation, ROV or divers can be deployed as appropriate. A sufficient sample of each layer/feature type will be investigated to elucidate the date, character, relationships, and function of the feature/structure.

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

9.9.8 The findings of any Watching Briefs will be compiled as an Archaeological Report consistent with industry standards set out in **Section 11**.

9.10 Protocol for Archaeological Discoveries (The Protocol)

- 9.10.1 A Protocol for Archaeological Discoveries (the Protocol) will be implemented as best practice to ensure that the dredging project is prepared for any unexpected discoveries of archaeological material – including shipwreck material, aircraft remains, submerged prehistoric material or other archaeological material.
- 9.10.2 The Protocol will be implemented to ensure that unexpected discoveries of archaeological material made outside of the above mitigation methods– including submerged prehistoric material, shipwreck material aircraft remains, and any other archaeological material – are addressed in a timely and appropriate manner.
- 9.10.3 The aim of the Protocol is to reduce any adverse effects of the scheme on the historic environment by enabling people working on the scheme to report archaeological finds in a manner that is both convenient to their everyday work and effective regarding curatorial requirements.
- 9.10.4 The Protocol has been specifically designed to deal with any discoveries made during the dredging phase of the project. Flow charts of actions/communications and recording sheets associated with the Protocol can be found in **Appendices 4-6**.
- 9.10.5 This Protocol is designed to be used in conjunction with a backhoe dredge methodology for capital dredging. Should other dredging methodologies be proposed, a review and re-issuing may be necessary.
- 9.10.6 Archaeological finds made during dredging and construction activities are important because they can shed light on past human use of the landscape, sea, and seabed. The information that such discoveries bring to light can help archaeologists better understand the human past and should, therefore be conserved to better protect these aspects of our history on behalf of future generations.
- 9.10.7 The Protocol will be implemented to ensure that these discoveries are reported and analysed. Whilst there is no industry standard Protocol for capital dredging schemes, the following methodology has been adapted from already approved protocols for other industries, for example the British Marine Aggregates Producers Association (BMAPA) and English Heritage (EH) *Protocol for Reporting Finds of Archaeological Interest* (BMAPA & EH 2005).

Methodology

- 9.10.8 The implementation will be initiated by awareness training (see **Section 9.11**) conducted by the Retained Archaeologist for the crews of the relevant vessels to ensure that all staff are aware of what constitutes an appropriate find. Contact details, including those of the Nominated Contacts and the Archaeological Contractor, will be circulated once they have been confirmed. Contact details will be circulated as soon as possible in advance of dredging commencing.
- 9.10.9 When discoveries are made by Staff, either on the seabed or onboard the dredging vessel, they can then be reported to a Site Representative on their vessel. The Site Representative will generally be the Master, or a person nominated by the Master to be the site Representative. The Site Representative then reports to the Nominated Contact – a person who has been appointed by the dredging contractor to co-ordinate implementation of the Protocol. The Nominated Contact will then report any discoveries to the Retained Archaeologist.

- 9.10.10 The Retained Archaeologist will in turn inform the Archaeological Curator. If the find is a 'wreck' within the meaning of the *Merchant Shipping Act* 1995 then the Client will also make a report to the Receiver of Wreck and will provide the droit number to the Retained Archaeologist. The Retained Archaeologist will produce an archaeological report of the finds at the end of the capital dredge.

Actions on the Dredging Vessel: Anomalies on the Seabed or Finds Recovered from the Seabed

- 9.10.11 If an anomaly is identified within the backhoe bucket or within the spoil barge hold, the Officer on Watch will inform the Master / Site Representative.
- 9.10.12 Where it is possible to identify the position of the anomaly or find, the Officer on Watch will temporarily cease dredging in the vicinity of the seabed location until the advice of the Retained archaeologist has been obtained. The Officer on Watch will arrange for dredging gear to be examined as soon as possible to see if any archaeological material is trapped within it and will inform the Master / Site Representative accordingly.
- 9.10.13 The Master / Site Representative will note the occurrence as soon as possible in the vessel's log together with the time and exact vessel position. Where possible, the log entry should include a close approximation of the original position of the anomaly on the seabed. Additionally, the area should be marked on navigational software.
- 9.10.14 The Master / Site Representative will also compile a Preliminary Record of the occurrence, using the form in **Appendix 6**.
- 9.10.15 The Master / Site Representative will inform the Nominated Contact of the occurrence as soon as possible, and pass on all available information, including a copy of the Preliminary Record and copies of any photographs, drawings or other records that have been made.
- 9.10.16 If, after encountering an anomaly, no archaeological material has been recovered, then no additional actions are required of staff on the vessel.
- 9.10.17 If finds have been recovered, the Master will arrange for the find(s) to be immersed in seawater in a suitable clean container, which should be covered. Any rust, concretion or marine growth should not be removed. When finds are landed they should be placed in a safe location ashore where they can be checked, recorded and/or collected by the Retained Archaeologist at an agreed point. This would ideally involve the segregation of an area within the onshore compound for recovered archaeological material, to be kept safe and in good condition.

Actions by the Nominated Contact

- 9.10.18 Once informed of a find by a Master / Site Representative, the Nominated Contact shall inform the Archaeological Contractor as soon as possible so that advice can be sought.
- 9.10.19 The Nominated Contact will confirm with the Master / Site Representative that all the details set out in the Preliminary Record are comprehensive and correct. The Nominated Contact shall pass on to the Archaeological Contractor all available information relating to the circumstances of the occurrence, including a copy of the Preliminary Record and copies of any other records that have been made.
- 9.10.20 The Nominated Contact informs other vessels dredging in the area where the discovery has been made and advises them to keep particular watch.

- 9.10.21 The Nominated Contact makes any recovered finds available for inspection by the Archaeological Contractor.

Actions by the Retained Archaeologist

- 9.10.22 When contacted by the Nominated Contact and once information has been passed on, the Archaeological Contractor will enter the information in the project database / GIS. Details of recovered finds that are 'wreck', as defined by the *Merchant Shipping Act 1995* as '*jetsam, flotsam, lagan and derelict found in or on the shores of the sea or any tidal water*', will be notified to the Receiver of Wreck in compliance with the *Merchant Shipping Act 1995*.
- 9.10.23 The Retained Archaeologist will review all information relating to the occurrence in conjunction with geophysical and/or desk-based information.
- 9.10.24 The Retained Archaeologist will advise the Nominated Contact of any further actions that may be required, including:
- advice on immediate actions to be taken in respect of the discovery, including the storage and protection of any recovered finds;
 - advice on the identification of finds and the character of their seabed locations.
- 9.10.25 When the available information has been reviewed, this may include relevant geophysical, geoarchaeological, desk-based data, and preliminary research, the Retained Archaeologist will assess the archaeological potential and importance of the discovery.
- 9.10.26 If a find is discovered on-board either the dredger or the associated spoil barges in the case of backhoe dredging, the find will be assessed for their level of archaeological interest by the on-board operatives, based on awareness training and the criteria outlined in **Appendix 6**. If the find is of potential archaeological interest, they will follow the strategy outlined in the Major Archaeological Find, Intermediate Archaeological Find and Minor Archaeological Find sections below.

Reporting

- 9.10.27 The Client will report any discovery of 'wreck' to the Receiver of Wreck, using the reporting console: <https://www.gov.uk/report-treasure-step-by-step>. The Client will provide the Retained Archaeologist with the droit number.
- 9.10.28 The Retained Archaeologist will produce an archaeological report of the analysis of any finds or anomalies at the end of the project and, if required will produce periodic reports following maintenance dredging. The results will be presented in a stand-alone format and will refer to the previous archaeological work.

9.11 Awareness Training

Pre-Dredging

- 9.11.1 The Retained Archaeologist will provide awareness training to all contractors working on the dredging works. The detailed training on the identification of finds of archaeological potential will ensure that staff are aware of what constitutes an appropriate find and the procedure for reporting such discoveries. Where the origin or nature of an item is in question the precautionary principle will be employed and the item fully reported through the Protocol outlined below.
- 9.11.2 Training will focus on the types of material likely to be discovered during the dredging, for example:

- aircraft material, what constitutes it, what types of material could be present and how to recognise it;
- shipwreck material, including identifying wood that has been worked (for example, includes the presence of treenails and/or has been shaped, for example for a logboat or a clinker-built boat), fixtures and fittings, pottery, and other material that could be present on a shipwreck; and
- prehistoric material, such as handaxes and palaeoenvironmental material that could be encountered.

- 9.11.3 More information regarding the types of materials that could be discovered can be found in **Appendix 6**. Training will also include information on handling and storing archaeological discoveries.
- 9.11.4 Training given to the dredging staff and any diving contractors, will have a substantially greater level of detail than that provided for general staff under the terms of the Protocol and will include advice on their responsibilities regarding the implementation of the WSI and Protocol as agreed by the Archaeological Curator(s).
- 9.11.5 In addition, training will ensure that all staff understand their role and the method for reporting finds of archaeological potential through the Protocol.
- 9.11.6 Awareness visits will take place prior to the commencement of work, and they will include: the project manager, superintendents, dredging staff, general vessel crew and office staff.
- 9.11.7 The timing of these visits will be based upon the dredging scheduled and staff/vessel changeovers, including pre-dredge clearance operations.
- 9.11.8 An awareness visit will be provided for each vessel before the dredging work commences. The captain and other crew members will be responsible for the training handover with their colleagues; however, additional awareness visits could be provided if requested to smooth the transition.
- 9.11.9 The Client will keep the Retained Archaeologist informed of the exact arrival dates for each vessel during the project.
- 9.11.10 Provision will be made for Historic England to attend a training session to monitor the approach and provide additional information if required. The Retained Archaeologist will contact Historic England regarding the most suitable awareness training.
- 9.11.11 Periodic visits to the dredge plant by the Retained Archaeologist will be planned to ensure proper adherence to the Protocol (see **Section 9.10**). The frequency and timing of these visits will be determined in accordance with the dredging programme.
- 9.11.12 Although unlikely to be an issue, should the need arise, Historic England will be informed if the methods of reporting are falling short of necessary standards. This is to ensure that Historic England can be confident that every effort is made to protect and record archaeological material from unwarranted impacts.



10 FINDS AND ENVIRONMENTAL

10.1 Finds

General

- 10.1.1 All archaeological finds from excavated contexts will be retained, although those from features of modern date (19th century or later) may be recorded on site and not retained, depending on the research objectives of the project. Where appropriate, soil samples may be taken and sieved to aid in finds recovery. Any finds requiring conservation or specific storage conditions will be dealt with immediately in line with *First Aid for Finds* (Watkinson and Neal 1998) and *First Aid for Underwater Finds* (Robinson 1998). A full record will be made of any treatment given.
- 10.1.2 Finds and other items of archaeological interest recovered offshore in the course of investigation are the property of The Crown Estate as the landowner, with the exception of any human remains, and 'wreck' for the purposes of the *Merchant Shipping Act 1995*, or material covered by the *Protection of Military Remains Act 1986*. The powers of the statutory harbour authority may also affect the issue of ownership, and the reporting requirements of any finds made.
- 10.1.3 As required under the *Merchant Shipping Act 1995* any finds will be held in storage, until such time that the droit on the item(s) is closed by the Receiver of Wreck. No finds are to be discarded until such permission has been granted for their disposal.

10.2 Ordnance

- 10.2.1 If items of ordnance are discovered, they will be treated with extreme care. Company Health & Safety policies and established operational procedures should always take priority over archaeological reporting of munitions and ordnance.
- 10.2.2 Due to the potential danger of unexploded ordnance if items are encountered it is important to:
- Recognise an item of UXO and accept that it is potentially dangerous;
 - Retreat from the UXO, do not touch, move or disturb and safely leave the area; and
 - Report the UXO location and give a description to the project's Explosive Ordnance Disposal (EOD) or relevant authorities (Police, HM Coastguard or Ministry of Defence).
- 10.2.3 Any incident causing the recovery of UXO must be reported by the vessel Master/or person in charge to HM Coastguard who will coordinate military Explosives Ordnance Disposal (EOD) support if there is a threat to life.
- 10.2.4 If an item of UXO is later discovered for example when the vessel is alongside or at a storage facility, the discovery is to be reported to the Police who will then arrange for Explosives Ordnance Disposal (EPD) support, ensuring public safety if there is a threat to life.



- 10.2.5 In the event that items are assessed to be blind or live¹ munitions they will need to be rendered safe either by military EOD or an appropriate third-party commercial EOD contractor associated with the project.
- 10.2.6 Unless held in a licensed store, retaining any live or blind UXO on site beyond 24 hours of discovery is an offence under the *Manufacture and Storage of Explosive Regulations* 2005.
- 10.2.7 Any firearms and ammunition are likely to be subject to the *Firearms Acts* (various dates). Ammunition should be regarded as ordnance, regardless of its size. Under Section 5 of the *Firearms Act* 1968, authority is needed to handle prohibited weapons, component parts and prohibited ammunition. Any firearms must be reported to the Police or EOD.
- 10.2.8 Further guidance is provided in The Crown Estate and Mineral Product's *Dealing with munitions in marine aggregates* (June 2006) and *Dealing with munitions in marine sediments* (March 2010).

10.3 Human remains

- 10.3.1 In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending the Retained Archaeologist obtaining a Ministry of Justice Licence (this includes cases where remains are to be left *in situ*).
- 10.3.2 Should human remains require removal, all excavation and post-excavation will be in accordance with the Retained Archaeologist's protocols, with any directions which may be given by the Secretary of State, and current guidance documents (e.g. McKinley 2013; ClfA 2017). Appropriate specialist guidance/site visits will be undertaken if required.
- 10.3.3 The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the Ministry of Justice licence.

10.4 Treasure

- 10.4.1 The Retained Archaeologist will immediately notify the Client and the Curator(s) on discovery of any material covered, or potentially covered, by the *Treasure Act 1996* (as amended by *The Coroners and Justice Act 2009*). All information required by the *Treasure Act* (i.e., finder, location, material, date, associated items etc.) will be reported to the Coroner within 14 days. Items falling under the *Treasure Act* will be removed from the site by the Retained Archaeologist and stored in a secure location, pending a decision by the Coroner.
- 10.4.2 Material recovered below Mean High Water Springs (MHWS) to 12 nm may be regarded as Wreck under the *Merchant Shipping Act* 1995.

10.5 Aircraft

- 10.5.1 Under the *Protection of Military Remains Act* 1986, it is an offence to tamper with, damage, move or unearth any items related to a military aircraft crash site, unless the Ministry of Defence has issued a licence authorising such an activity. A license is required irrespective of whether the aircraft was in the service of another nation's armed forces.

¹ Live – contains explosives and have not been fired. Blind – have fired but failed to function as intended.

- 10.5.2 Application for a licence, and any subsequent work, should be undertaken in line with the Ministry of Defence's *Military Aircraft of Historical Interest: Licensing of Excavations in the UK: Notes for Guidance of Recovery Groups* (Revised 2018)². Should human remains be discovered, they should not be touched, but must be reported immediately to the Ministry of Defence (as per paragraph 15 of the guidance).
- 10.5.3 Any finds that are suspected of being military aircraft will be reported immediately to the Retained Archaeologist. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately. Discoveries of aircraft material must be reported to the MoD, JCCC and, if recovered, to the Receiver of Wreck within 28 days of discovery.
- 10.5.4 For the archaeological assessment of aircraft remains, the Retained Archaeologist will refer to available guidance from Archaeological Curator(s), such as, in England, *Military Aircraft Crash Sites: Archaeological Guidance on their significance and Future Management* (English Heritage, 2002)

10.6 Wreck

- 10.6.1 There is a legal obligation under the *Merchant Shipping Act* 1995 that all material identified as 'wreck' must be reported to the Receiver of Wreck within 28 days of discovery.
- 10.6.2 According to section 255 of the Act, 'wreck' can be defined as 'jetsam, flotsam, lagan and derelict found in or on the shores of the sea or any tidal water' that have come from a ship, aircraft or hovercraft (vessel) and includes cargo and equipment.
- 10.6.3 Not only does the legislation cover wreck material recovered from within UK territorial waters (12 nautical miles), but also material that has been brought into UK territorial waters from elsewhere. The Receiver of Wreck's remit does not extend to lakes or rivers beyond tidal reach.
- 10.6.4 Wreck material is reported to the Receiver of Wreck by completing a 'Report of wreck and salvage' form (MSF 6200). A droit number will be assigned to each report of wreck, which could include a single or multiple objects from one location/wreck site.
- 10.6.5 The Receiver of Wreck's remit is to research and establish who owns the wreck and to liaise with the finder, owner or other interested parties including archaeologists and museums.
- 10.6.6 All material reported as wreck must be retained and held on indemnity to the Receiver of Wreck's orders whilst the droit remains open, which could extend beyond a year. The location(s) of such storage will be confirmed following discussion between the Client and/or their appointed representatives and the Retained Archaeologist. The Receiver of Wreck must be made aware of these storage locations and any further movement of reported material.
- 10.6.7 If the Receiver of Wreck has not found ownership of any recovered wreck material within one year, the material becomes 'unclaimed' and as such the property of the Crown. The Receiver of Wreck can then dispose of these items on behalf of the Crown. For material that is of historical or archaeological importance, the Receiver of Wreck will try to ensure that it is offered to an appropriate museum. If an appropriate museum or institution is not

2

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916555/20180514_Licence_NotesforGuidance_2018-3.pdf

found, then the Receiver of Wreck may offer the material to the finder *in lieu* of salvage. Due to the longevity of this process, it is essential that the Client/their representative are fully aware of the obligations of the *Merchant Shipping Act* 1995 and frequently liaise with the Receiver of Wreck until a decision on ownership has been made and the droits can be formally closed.

- 10.6.8 If a museum or suitable institution is found by the Retained Archaeologist, this should be confirmed through liaison between the Client/their representative (as the named finder on the Report of Wreck and Salvage) with the Receiver of Wreck. It is furthermore recommended that droits are formally closed by the Receiver of Wreck prior to material being accessioned by a museum.

10.7 Environmental

- 10.7.1 All sampling undertaken for archaeological purposes will be undertaken following the Retained Archaeologist's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b).
- 10.7.2 Bulk environmental soil samples, for the recovery of plant macrofossils, wood charcoal, small animal bones and other small artefacts, will be taken as appropriate from well-sealed and dateable contexts or features.
- 10.7.3 If waterlogged or mineralised deposits are encountered, an environmental sampling strategy will be devised and agreed with the Curator(s) as appropriate. Specialist guidance will be provided by the Retained Archaeologist, with site visits undertaken if required.
- 10.7.4 Any samples recovered for archaeological purposes will be of an appropriate size – typically 40 litres for the recovery of environmental evidence from dry contexts, and 10 litres from waterlogged deposits.
- 10.7.5 Following specialist advice, other sampling methods such as monolith, Kubiena or contiguous small bulk (column) samples may be employed to enable investigation of deposits with regard to microfossils (e.g., pollen, diatoms) and macrofossils (e.g., molluscs, insects), soil micromorphological or soil chemical analyses.

11 POST-EXCAVATION AND REPORTING

11.1 Finds

- 11.1.1 All retained finds will, as a minimum, be washed, weighed, counted, and identified. They will then be recorded to a level appropriate to the aims and objectives of the investigation. The report will include a table of finds by period and/or feature group.
- 11.1.2 Metalwork from stratified contexts will be X-rayed and, along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects and other conservation needs will be undertaken by the Retained Archaeologist's in-house conservation staff, or by another approved conservation centre.
- 11.1.3 Artefacts and other finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards in ClfA 2020c.

11.2 Conservation and storage

- 11.2.1 All recovered materials of archaeological interest, from land or underwater, will be subject to a Conservation Assessment to gauge whether special measures are required while the material is being held. The Conservation Assessment must be approved by the Archaeological Curator(s) and, where applicable, the Receiver of Wreck. This Conservation Assessment will be carried out by the Retained Archaeologist or an Archaeological Contractor with an appropriate level of expertise, with advice from appropriate specialists. The Retained Archaeologist or an Archaeological Contractor with appropriate expertise will implement recommendations arising from the assessment. If no special measures are recommended, finds will be conserved, bagged, boxed and stored in accordance with industry guidelines (ClfA 2020a). For all items which receive a droit from the Receiver of Wreck, the costs of stabilisation and storage for these finds will be passed on to the Client until the droit has been resolved.

11.3 Environmental

- 11.3.1 Bulk environmental soil samples selected for archaeological purposes will be processed by standard flotation methods and scanned to assess the environmental potential of deposits. The flot will be retained on a 0.25 mm mesh, with residues fractionated into 5.6/4 mm, 2 mm, 1 mm and 0.5 mm and dried if necessary. Coarse fraction (>5.6/4 mm) will be sorted, weighed and discarded, with any finds recovered given to the appropriate specialist. Finer residues will be retained until after any analyses and discarded following final reporting (in accordance with the Selection policy, below).
- 11.3.2 In the case of samples from cremation-related deposits the flots will be retained on a 0.25 mm mesh, with residues fractionated into 4 mm, 2 mm and 1 mm. In the case of samples from inhumation deposits, the sample will be artefact sieved through 9.5 mm and 1 mm mesh sizes. The coarse fractions (9.5 mm) will be sorted with any finds recovered given to the appropriate specialist together with the finer residues.
- 11.3.3 Any waterlogged or mineralised samples will be processed by standard waterlogged flotation methods.

11.4 Reporting

General

- 11.4.1 Following completion of the fieldwork and/or the assessment of the data, draft report(s) will be submitted for approval to the Client and the Curator(s), for comment. Reports may be issued for individual fieldwork or assessment packages with a final close-out report, or the work summarised in a single final report. Once approved, a final version will be submitted.
- 11.4.2 The report will typically include the following elements:
- A non-technical summary;
 - The aims and methods of the work;
 - The results of the work including finds and environmental remains;
 - A statement of the potential of the results;
 - Proposals for further analysis and publication;
 - Appendices;
 - Illustrations; and

- References

- 11.4.3 A copy of the report(s) will be deposited with the National Marine Heritage Dataset (Mariner) and the Cornwall HER, along with surveyed spatial digital data (.dxf or shapefile format) relating to the evaluation.

Publication

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

OASIS

- 11.4.5 An OASIS online record (<https://oasis.ac.uk/>) will be created, with key fields completed, and a .pdf version of relevant reports submitted, within six months of each report being approved by the Client. Copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service ArchSearch catalogue. However, projects subject to any contractual requirements on confidentiality, or with the discovery of vulnerable sites, will only be uploaded to OASIS following confirmation from the Client and/or Archaeological Curator.

12 ARCHIVE STORAGE AND CURATION

12.1 Museum

- 12.1.1 Every effort will be made to identify a suitable repository for the archive resulting from the investigation. If no suitable repository is identified, the Retained Archaeologist will continue to store the archive, but may institute a charge to the client for ongoing storage beyond a set period.
- 12.1.2 Shipwrecks and any material relating to a wreck found in or on the shores of the sea or any tidal water must be reported to the Receiver of Wreck receiving a unique droit number. Deposition of any finds with the museum will only be carried out with the agreement of The Crown Estate or the owner of the material (as confirmed by the Receiver of Wreck). Any droits should be formally closed by the Receiver of Wreck prior to material being accessioned to a museum. If droits are still open immediately prior to deposition, then the museum must agree to accept the material with open droits in the understanding that they will eventually be closed to the museum. Ensure that the Receiver of Wreck is aware of this agreement.
- 12.1.3 The Retained Archaeologist may institute a charge to the client for the cost of long-term storage of the archive beyond a set period whilst the droit and long-term plans for the recovered material is resolved.

12.2 Transfer of title

- 12.2.1 On completion of the investigation (or extended fieldwork programme), every effort will be made to encourage the legal owner of any finds recovered (e.g. The Crown Estate or FDEC), with the exception of human remains and any objects covered by the *Treasure Act* 1996 or aircraft material covered by the *Protection of Military Remains Act* 1986 (and therefore under the ownership of the Joint Casualty and Compassionate Centre of the Ministry of Defence), to transfer their ownership to the museum in a written agreement. Furthermore, ownership would be sought by the Receiver of Wreck for any material reported under the *Merchant Shipping Act* 1995. Droit reports associated with such material must be formally closed prior to material being accessioned by a museum.

12.3 Preparation of archive

Physical archive

- 12.3.1 The physical archive, which may include paper records, graphics, artefacts and ecofacts will be prepared following the standard conditions for the acceptance of excavated archaeological material, and in general following nationally recommended guidelines (SMA 1995; ClfA 2020c; Brown 2011; ADS 2013).
- 12.3.2 The physical archive will usually be deposited within one year of the completion of the project, with the agreement of the Client. Where artefacts have been recovered and reported to the Receiver of Wreck, deposition may take longer than a year and only after any droit reports have been closed. Liaison with the Receiver of Wreck and the museum throughout the project will allow discussions to occur to arrange for any required accessioning prior to the droits being officially closed.

Digital archive

- 12.3.3 All digital data produced for the archaeological assessment will be considered part of the primary archive and will accord with the procedures recommended by The Crown Estate, Marine Environment Data and Information Network (MEDIN), Archaeological Data Service (ADS) and the accepting institution.
- 12.3.4 Data will be compiled in a format suitable for submission of Monument, Event and Source records for entry into the National Marine Heritage Dataset (Mariner) and the Cornwall HER (terrestrial and inshore).
- 12.3.5 If required by the museum/accepting institution following agreement with the Client, the digital data, or selected digital data, will be deposited with a Trusted Digital Repository, in this instance the ADS, to ensure its long-term curation. Digital data will be prepared following ADS guidelines (ADS 2013 and online guidance) and accompanied by metadata.

12.4 Selection strategy

- 12.4.1 It is widely accepted that not all the records and materials (artefacts and ecofacts) collected or created during the course of an archaeological project require preservation in perpetuity. These records and materials will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, i.e., the retained archive should fulfil the requirements of both future researchers and the receiving Museum.
- 12.4.2 The relevant Archaeological Curator(s) and the Retained Archaeologist will agree with the receiving institution a policy for the selection, retention and disposal of recovered or excavated material, and confirm requirements in respect of the format, presentation and packaging of archive records and materials. This will be underpinned by national guidelines on selection and retention (Brown 2011, section 4) and generic selection policies (SMA 1993; Wessex Archaeology's internal selection policy) and follows the ClfA's Toolkit for Selecting Archaeological Archives. It should be agreed by all stakeholders (Wessex Archaeology's internal specialists, external specialists, museum) and fully documented in the project archive.
- 12.4.3 Where possible, the receiving institution will be notified in advance of any fieldwork. However, due to the nature of some types of fieldwork whereby it is often unknown what finds could be recovered, these discussions may take place during or even after fieldwork has ended. However, selection, retention and disposal of recovered or excavated material

should only occur if the legislative requirements of the *Merchant Shipping Act 1995* and *Protection of Military Remains Act 1986* are fully undertaken and the Receiver of Wreck and Ministry of Defence are involved in any such decisions.

12.4.4 It is important to note that selection, retention and disposal of recovered or excavated material should only occur if the legislative requirements of the *Merchant Shipping Act 1995* and *Protection of Military Remains Act 1986* are fully undertaken and the Receiver of Wreck and Ministry of Defence are involved in any such decisions, for instance ensuring all droits are closed prior to discard or transfer to a suitable museum.

12.4.5 The project-specific selection strategy is presented below. Further modifications are expected to be made to the selection strategy as the project progresses; specific review points will be at assessment stage, and on project completion prior to final archive preparation.

Finds

12.4.6 Selection, retention and disposal of recovered or excavated material should only occur if the legislative requirements of the *Merchant Shipping Act 1995* and *Protection of Military Remains Act 1986* are fully undertaken and the Receiver of Wreck, Ministry of Defence and other relevant stakeholders including the Archaeological Curator are involved in any such decisions.

12.4.7 Consultation with all stakeholders regarding project-specific selection decisions will be undertaken throughout the project as necessary, however at a minimum of three project review points:

- Data gathering: if any unforeseen discovery on site necessitates an amendment to the proposed collection strategy, or if adjustments are made to any sampling strategy;
- End of data gathering (assessment stage); and
- Archive compilation.

12.4.8 If material is not accepted by a museum or other organisation and all legislative requirements are fully undertaken, then consideration will be given to the suitability for their use within handling or teaching collections by the museum or Wessex Archaeology, or whether they are of particular interest to the local community. Remaining de-selected material will be disposed of. All such material will be adequately recorded to the appropriate level before de-selection.

Documentary and digital records

12.4.9 It is widely accepted that not all records collected during the course of an archaeological project require preservation in perpetuity. These records will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, i.e. the retained archive should fulfil the requirements of both future researchers and the receiving Museum.

12.4.10 The selection strategy, which details the project-specific selection process, is underpinned by national guidelines on selection and retention (Brown 2011, section 4) and generic selection policies (SMA 1993; Wessex Archaeology's internal selection policy) and follows ClfA's Toolkit for Selecting Archaeological Archives. It should be agreed by all stakeholders

(Wessex Archaeology's internal specialists, external specialists, local authority, museum) and fully documented in the project archive.

- 12.4.11 To promote long-term future reuse, deposition file formats will be of archival standard, open source and accessible in nature following national guidance from ADS 2013, ClfA 2020c and the requirements of the digital repository.
- 12.4.12 Any sensitive data to be handled according to Wessex Archaeology data policy to ensure it is stored and transferred securely. The identity of individuals will be protected in line with GDPR. If required, data will be anonymised and redacted. Selection and retention of sensitive data for archival purposes will occur in consultation with the client and relevant stakeholders. Confidential data will not be selected for archiving and will be handled as per contractual obligation.
- 12.4.13 De-selected data will be stored on Wessex Archaeology secured servers on offsite storage locations. The Wessex Archaeology IT department has a backup strategy and policies that involves daily, weekly and monthly and annual backups of data as stated in the DMP. This strategy is non-migratory, and original files will be held at Wessex Archaeology under their unique project identifier, as long as they remain useful and usable in their final version format. This data may also be used for teaching or reference collections by the museum, or by WA unless otherwise required by contractual or copyright obligations.

Palaeoenvironmental material

- 12.4.14 All contexts suitable for environmental sampling will be considered for sampling. A site-specific sampling strategy (SSSS) may be recommended for this project and will be prepared to accompany this WSI. The SSSS is intended to guide the retrieval of paleoenvironmental evidence during the site investigations with the purpose of addressing their site-specific objectives. The SSSS will be prepared following Wessex Archaeology's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b). Where applicable, the Archaeological Curator should be included in any discussions.
- 12.4.15 De-selected material from samples will be disposed of after processing and post-excavation recording. All processed material will be adequately recorded to the appropriate level before de-selection.

12.5 Security copy

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

13 COPYRIGHT

13.1 Archive and report copyright

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



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

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

13.2 Third party data copyright

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

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APPENDICES

Appendix 1: Palaeogeographic features of archaeological interest

WA_ID	Type	Archaeological Discrimination	Depth Range (mBSB)		Description
			From	To	
7001	Channel	Moderate	2	9	A palaeochannel striking broadly WNW, 150 x 302m in size. It is very likely that this feature continues further south-east, though data availability within the confines of this study limits investigation. This channel represents the high-energy erosional flow of water through a location. Two boreholes from within the feature boundaries (WA-VC21, WA-VC24) allow an insight into infilled material and into the archaeological potential of the channel. Infill is a layered accumulation of estuarine alluvium and is not of inherent archaeological interest. WA-VC21 is through the northern flank of the channel, where erosion has cut into bedrock, again, with limited archaeological potential displayed. Along the southern flank of the channel, WA-VC24 shows that the channel cuts into the Palaeolithic head unit, increasing the potential for inclusion of reworked Palaeolithic artefacts into the channel infill.
7002	Peat Bed	High	0.75	2	Feature 7002 is a peat body stratigraphically above the southern flank of channel 7001. Peat was identified within borehole WA-VC04, and is of significant archaeological importance. Within the core, peat was interspersed with estuarine alluvium at a scale too small for data resolution to display. However, the instance of this repeating peat-alluvium sequence within WA-VC04 intersects a small but discrete feature. This feature can be traced over 14 seismic lines, is 150 x 40m in area, and is ~1.5m thick in places. While there is the potential for the peat to be of limited extent within this feature, the presence of such material is of high archaeological importance.



Appendix 2: Maritime archaeology gazetteer

WA_ID	Type	Name	Ext. Reference	Built	Lost	Construction	Description	Manner of loss	BNG_N (SW)	BNG_E (SW)
2000	Minesweeper	HMS <i>Resparko</i>	HOBUID_919751; CHER_MCO5956 2	1928	1940	Steel	Converted trawler. Hired by RN in First World War as anti-submarine patrol vessel, converted to minesweeper in 1940. Sunk in air raid August 1940. Tonnage - 253 gross. L - 37m B - 7m D - 4m.	Bombed	32681	181820
2001	Wreck		UKHO_16349				Dangerous Wreck. Now declared DEAD.		32538	181490
2002	Wreck		UKHO_88263				Barge	Intentionally sunk	32814	181811
2003	Wreck		UKHO_94278				Dangerous wreck	Intentionally sunk	32735	181811
2004	Structure	Empire Jetty	UKHO_73080	1933	2007	Wood	Debris from the remains of Empire Wharf. Wharf demolished to seabed level but significant debris remains.	Demolished	32869	181666
2005	Structure	King's Jetty	UKHO_73081	1937	2007	Wood	Debris from the remains of King's Wharf. Wharf demolished to seabed level but significant debris remains.	Demolished	32758	181651
2006	Wreck						Rectangular pontoon or barge similar to 2002 lying to east side of wreck 2003 identified in bathymetry survey		32744	181817
2007	Anchor and Chain		Falmouth Cruise Project GT 24			Iron	Iron stockless anchor with length of chain discovered during ground-truthing of		33130	181923



WA_ID	Type	Name	Ext. Reference	Built	Lost	Construction	Description	Manner of loss	BNG_N (SW)	BNG_E (SW)
							geophysical anomalies 2007-8			



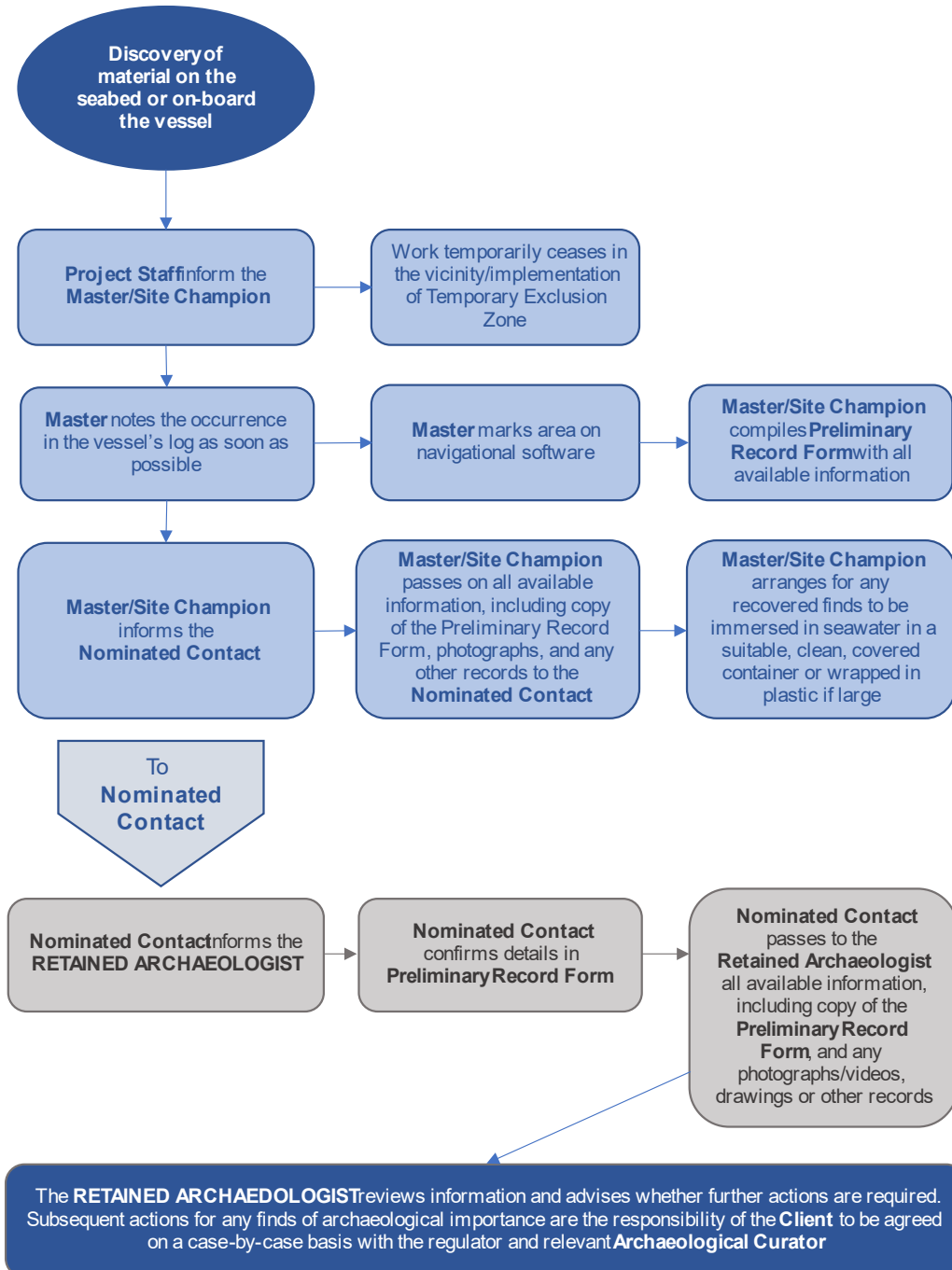
Appendix 3: Gazetteer of intertidal features

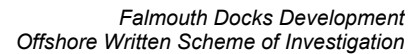
WA_ID	Ext. Reference	Type	Period	Description	Observations	BNG_N (SW)	BNG_E (SW)
1001	MCO50123	Structure	Modern	Barrage Ballon Site. Original site around 11m. Anchor point for Second World War barrage balloon.	No	32568	181673
1002	MCO50128	Structure	Modern	Slipway. 82m long slipway constructed during Second World War. Remains have been destroyed by present development.	No	32521	181614
1003	MCO50127	Structure	Modern	Embarkation Hard. Second World War embarkation point. Destroyed by modern development.	No	32483	181567
1004	MCO55453	Submerged landscape	Prehistoric	Evidence of submerged landscape, Mesolithic-Neolithic preserved in core samples taken from this location.	No	33010	182095
1005		Anchors	Modern	Anchors along western edge of Western Wharf. 1 x stockless, other possibly Admiralty pattern	Yes	32833	181760



Appendix 4: Actions on the dredging vessel - anomalies on the seabed or finds recovered from the seabed- (Vessel chain of command to be confirmed)

Protocol for Archaeological Discoveries: actions for discoveries on the seabed or on-board a vessel





Discoveries: Preliminary Record Form	
When and Where?	
Where Found: Wharf ☐ Vessel ☐ Seabed (e.g. anomaly) ☐	
Name of Finder:	Date Found:
Seabed Development Area: Track plot of vessel provided? Yes ☐ No ☐	
Position (if possible): Datum: Accuracy: ☐ GPS Fix ☐ Approximate ☐ Centre point ☐ Estimated from Sources	
What is it?	
Description of the find(s):	
What Next?	
Photographs taken ☐ Treatment Given: Kept Wet ☐ Kept Dry ☐ Current Location: ☐ Wharf: _____ ☐ Other: _____ ☐ Vessel: _____ ☐ Seabed (for anomalies encountered)	
Any other notes:	
Form Complete	
Name of compiler: ☐ Site Champion ☐ Vessel Master ☐ Other _____	
Signed:	Date:



Appendix 6: Guidelines for Identifying Finds of Archaeological Interest

This text is based on the categories outlined in the Protocol for Reporting Finds of Archaeological Interest, published by the British Marine Aggregate Producer's Association (BMAPA) and English Heritage (now Historic England), 2005. The variety in significance across each type of find means that the day-to-day assessment of individual receptors as Major, Intermediate or Minor finds will be completed by an appropriately qualified archaeologist, either working directly on site with each receptor or remotely using images, dimensions, and video stills.

Bone

Major Archaeological Finds

Human bone is definitely of archaeological interest and is also subject to special legal requirements under the Burial Act 1857. Any suspected human bone should be reported and treated with discretion and respect.

Large quantities of animal bone may indicate a wreck (the remains of cargo or provisions) and should be reported.

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 and recovered if feasible.

Intermediate Archaeological Finds

Individual fragments or small quantity/low densities 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. Should any such anthropomorphic damage, breaking or cutting be identified then the find will be considered a Major Archaeological Find.

Pottery

Intermediate Archaeological Finds

Any fragment of pottery is potentially of interest, especially if it is a large fragment. Individual fragments or small quantity/low densities of pottery are considered an Intermediate Archaeological Find and likely to date prior to 1750. Items with unusual shape, glaze or fabric should be reported. It is noted that there is the potential for residue analysis on ceramic sherds and vessels recovered from marine environments, and this should be considered where these are recovered (Historic England 2017).

As the area may have been used as a landing place for ships throughout prehistory and history, there is also the potential for trade and exchange to be visible within the ceramic assemblage.

Minor Archaeological Finds

Items which look like modern crockery would be considered to be a minor archaeological find, until further assessment.

Brick



Intermediate Archaeological Finds

Bricks that do not have V-shaped hollows ('frogs') and/or are small, thin, or generally appear different than modern bricks could date back to the medieval or Roman period and should be reported.

Minor Archaeological Finds

Bricks with modern proportions and 'frogs' are of little to no archaeological interest.

Wood

Major Archaeological Finds

If the material discovered on the seabed, or recovered to the surface, appears to represent material from a wreck site, it must 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.

Intermediate Archaeological Finds

Roundwood that has clearly been shaped or made into a point should be reported.

Minor Archaeological Find

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.

Peat and Clay

Major Archaeological Find

Peat is black or brown fibrous soil that formed when sea-level was so low that the seabed formed marshy land, on the banks of a river or estuary, for example. The 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 such as stone tools, including hand axes, 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. Should evidence for trackways associated with peat be uncovered, this would constitute a Major Find and further investigations would be necessary.

Fine-grained sediments such as silts and clays are often found in 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.



Intermediate Archaeological Finds

Isolated discoveries of peat or clay.

Stone

Major Archaeological Finds

The recovery of numerous stones may indicate the ballast mound of a wreck or a navigational cairn, and all occurrences should be reported. Additionally, if a large concentration of stone material (as described below) is encountered, it would also be considered a major archaeological find.

Intermediate Archaeological Finds

Small to medium size stones that are shaped, polished and/or pierced may be prehistoric axes. Objects such as axe heads or knife blades made from flint are also of prehistoric date. 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.

Rubber, Plastic, etc.

Major Archaeological Finds

If rubber and plastic materials are discovered in the same area as aluminium objects and structures, they could indicate wreckage from a World War II aircraft, and therefore this material should be reported.

Minor Archaeological Finds

Except for the above, in most cases, rubber, plastic, Bakelite and similar modern materials are of little to no archaeological interest.

Iron and Steel

The potential range and date of iron and steel objects is so wide that it is difficult to provide general guidance. However, the following provides an outline of what might constitute a major or intermediate find.

Major Archaeological Finds

If the material discovered on the seabed or recovered to the surface appears to represent material from a wreck site.

If an area contains numerous 'concretions' (iron and steel objects covered by a thick amorphous concrete-like coating), it could represent a wreck site, and should be treated as a major archaeological find.

A concentration of pieces of metal sheet and structure may also represent a wreck site and should be treated as a major archaeological find.

Intermediate Archaeological Finds



The discovery of an isolated anchor would be considered to be an intermediate archaeological find, however, if it is discussed in association with timber or iron and steel material as discussed above, it could be part of a wreck site.

Isolated concretions, pieces of sheet metal and/or structure may also be of archaeological interest and should be reported.

Minor Archaeological Finds

Isolated modern material, such as lost fishing gear, would be considered a minor archaeological find.

Other Metals

Major Archaeological Finds

Aluminium objects may indicate aircraft wreckage from World War II, especially if two or more pieces of aluminium are fixed together by rivets. All occurrences should be reported.

Concentrations of copper and copper alloy (bronze, brass) objects, precious metal objects and coins are of interest, as they could indicate a wreck site.

Minor Archaeological Finds

Items made of thin, tinned, or painted metal sheet are unlikely to be of archaeological interest.

Isolated discoveries.

Ordnance

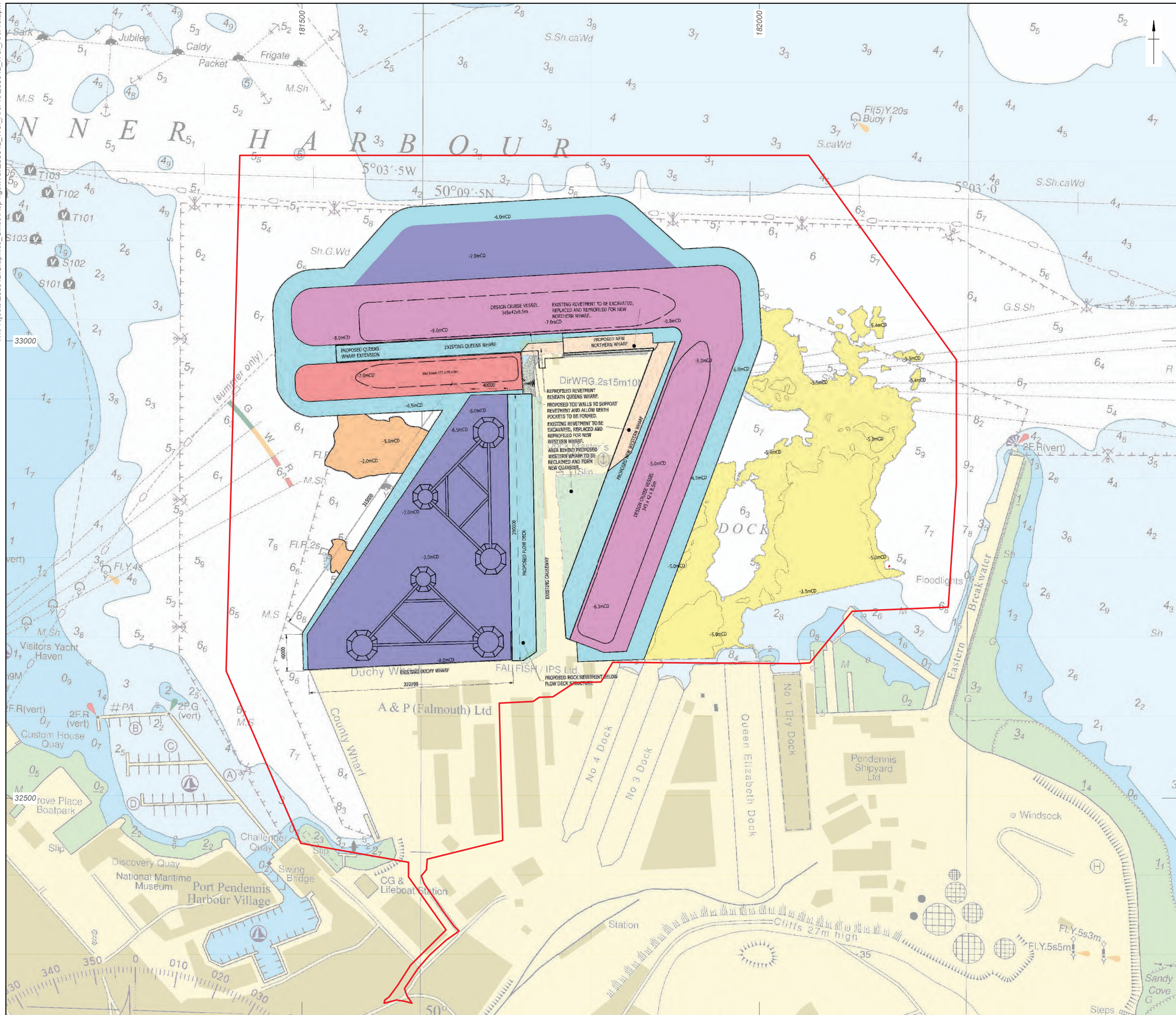
Any ordnance that is discovered should be dealt with based on the company UXO policy, as safety takes priority over archaeological objectives. However, discoveries of ordnance may be of archaeological interest (including cannonballs, bullets, and shells), and they should be reported.



Appendix 7: Archaeological Wreck Recording Levels

Level	Type	Objective	Sub-level	Character	Scope	Description
1	Assessment	A record sufficient to establish the presence, position and type of site.	1a	Indirect (desk-based)	A basic record based on documentary, cartographic or graphic sources, including photographic (incl. AP), geotechnical and geophysical surveys commissioned for purposes other than archaeology.	Documentary assessment / inventory of a site, compiled at the start of work on a site, and updated as work progresses.
			1b	Direct (field)	A basic record based on field observation, walkover survey, diving inspection etc., including surveys commissioned specifically for archaeological purposes.	Typically, a 1-2 dive visit to the site (to assess a geophysical anomaly, etc.).
2	Evaluation	A record that provides sufficient data to establish the extent, character, date and importance of the site.	2a	Non-intrusive	A limited record based on investigations that might include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc.	Typically, a 2-4 dive visit to assess the site's archaeological potential, backed up by a sketch plan of the site with some key measurements included.
			2b	Intrusive	A limited record based on investigations including vigorous cleaning, test pits and/or trenches. May also include recovery (following recording) of elements at immediate risk or disturbed by investigation.	Either an assessment of the buried remains present on a site; the recovery of surface artefacts; or cleaning to inform for example a 2a investigation.
3	In situ	A record that enables an Archaeologist who has not seen the site to comprehend its components, layout and Sequences.	3a	Diagnostic	A detailed record of selected elements of the site.	The first stage of a full record of the site. This would include a full measured sketch of the site and a database (or equivalent) entry for all surface artefacts.
			3b	Unexcavated	A detailed record of all elements of the site visible without excavation.	Full site plan (i.e. planning frame or equivalent accuracy) with individual object drawings, and full photo record (possibly including a mosaic).
			3c	Excavated	A detailed record of all elements of the site exposed by open excavation of part or whole of the site.	This may take the form of full or partial excavation of a site.
4	Removal	A record sufficient to enable analytical reconstruction and/or reinterpretation of the site, its components and its matrix.	-	-	A complete record of all elements of the site in the course of dismantling and/or excavation.	-
5	Intra-site	A record that places the site in the context of its landscape and other comparable sites.	-	-	A complete record of all elements of the site, combined with selective recording of comparable sites and investigation of the surrounding area.	-

Note: These levels represent guidance formulated by Wessex Archaeology for use during the archaeological investigation of wreck sites. They are currently used by English Heritage but have not been formally accepted as a standard means of grading archaeological work.



- Site boundary
- Study Area

Proposed dredge plan (Ramboll UK Ltd)

- Dredge to -10.5m CD:
55,503m²
229,847m³
- Dredge to -10.5m CD for TwinHub:
59,960m²
223,745m³
- Dredge to -10.5m CD for Bay Class:
9,810m²
32,945m³
- Graded sides:
55,045m²
122,506m³
- Remove obstructions from demolished
timber jetty -6.0m CD:
5,501m²
6,051m³
- Surface skim to maintain -5.5m CD:
46,653m²
26,646m³

0 100 m

Coordinate system: OSGB 1936 British National Grid

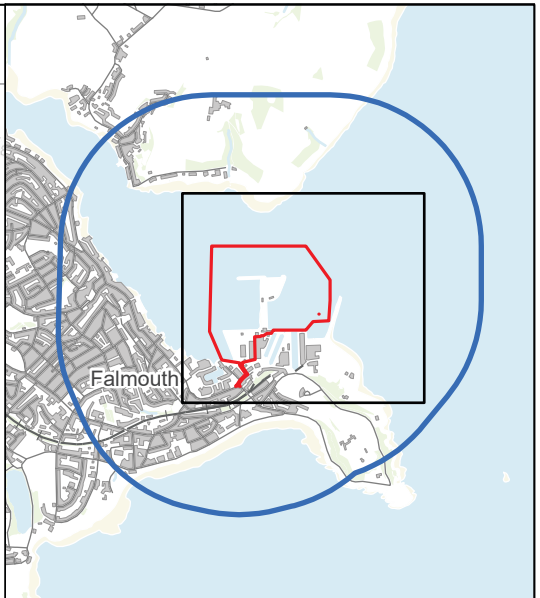
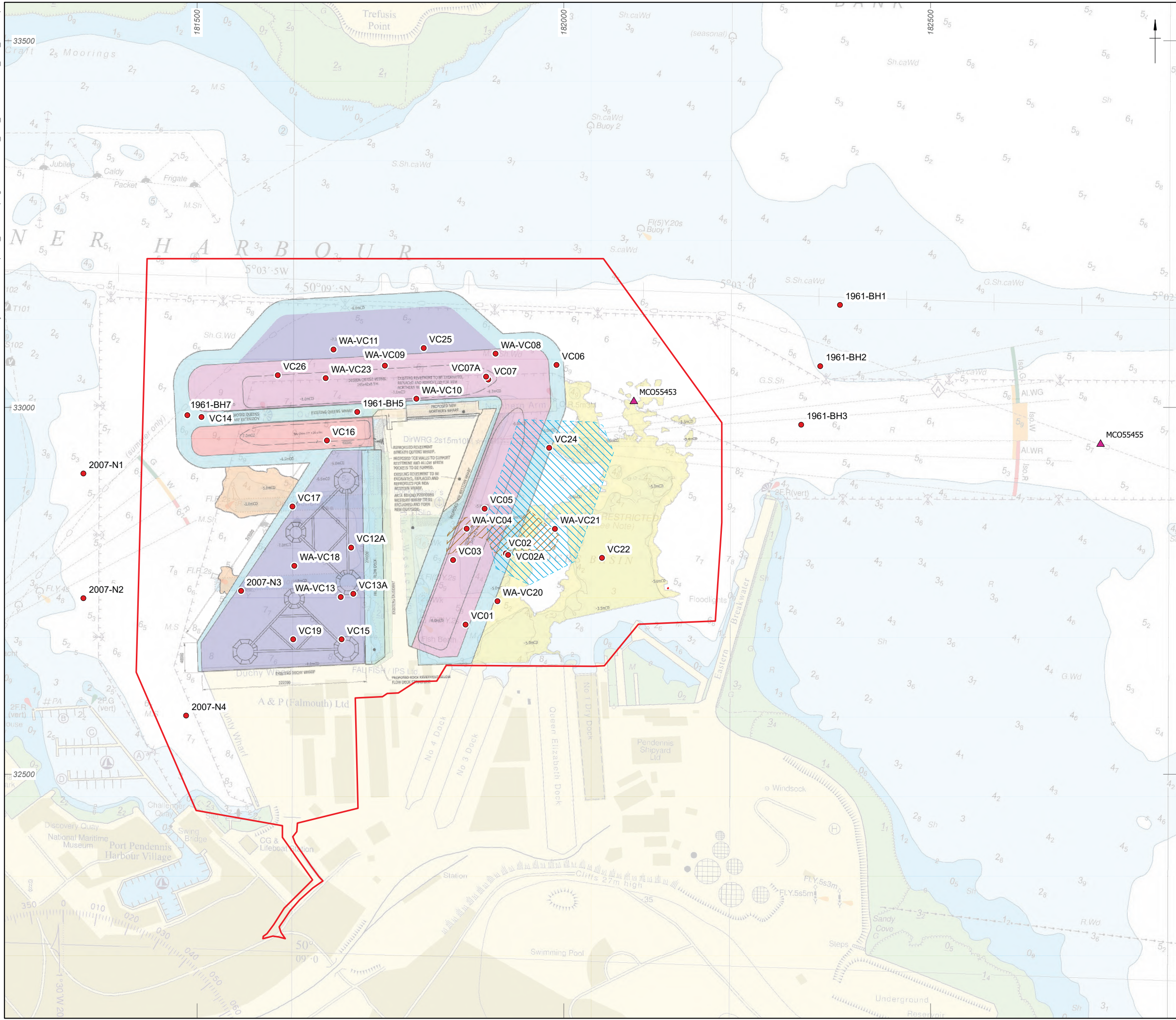
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Scale: 1:4,000 at A3 Revision: 0



Figure 1: Site location and study area



- Study Area
- Site boundary
- Cornwall HER - peat deposits
- GI data
- 7001 – Palaeochannel
- 7002 – Peat Deposit

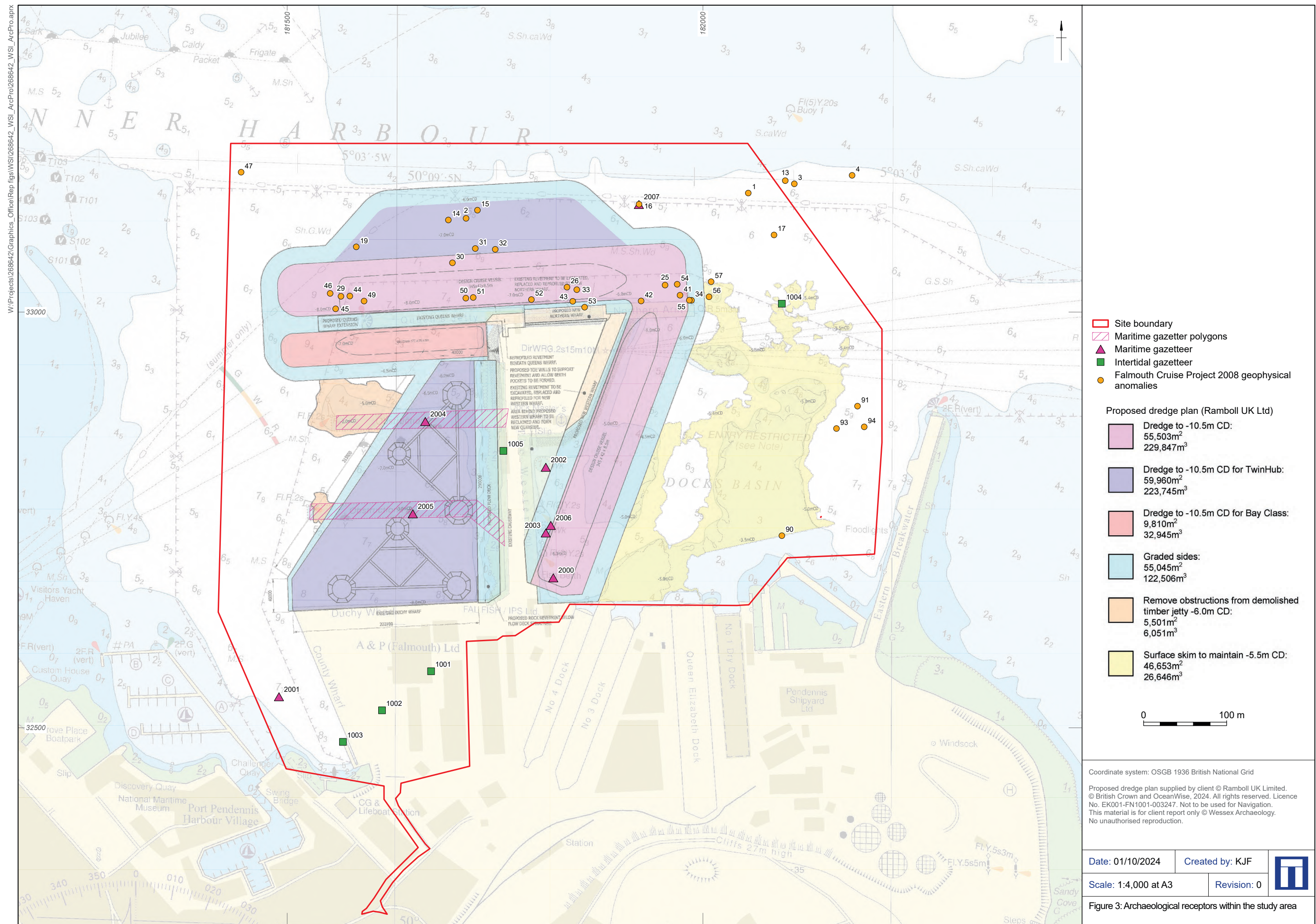
Proposed dredge plan (Ramboll UK Ltd)

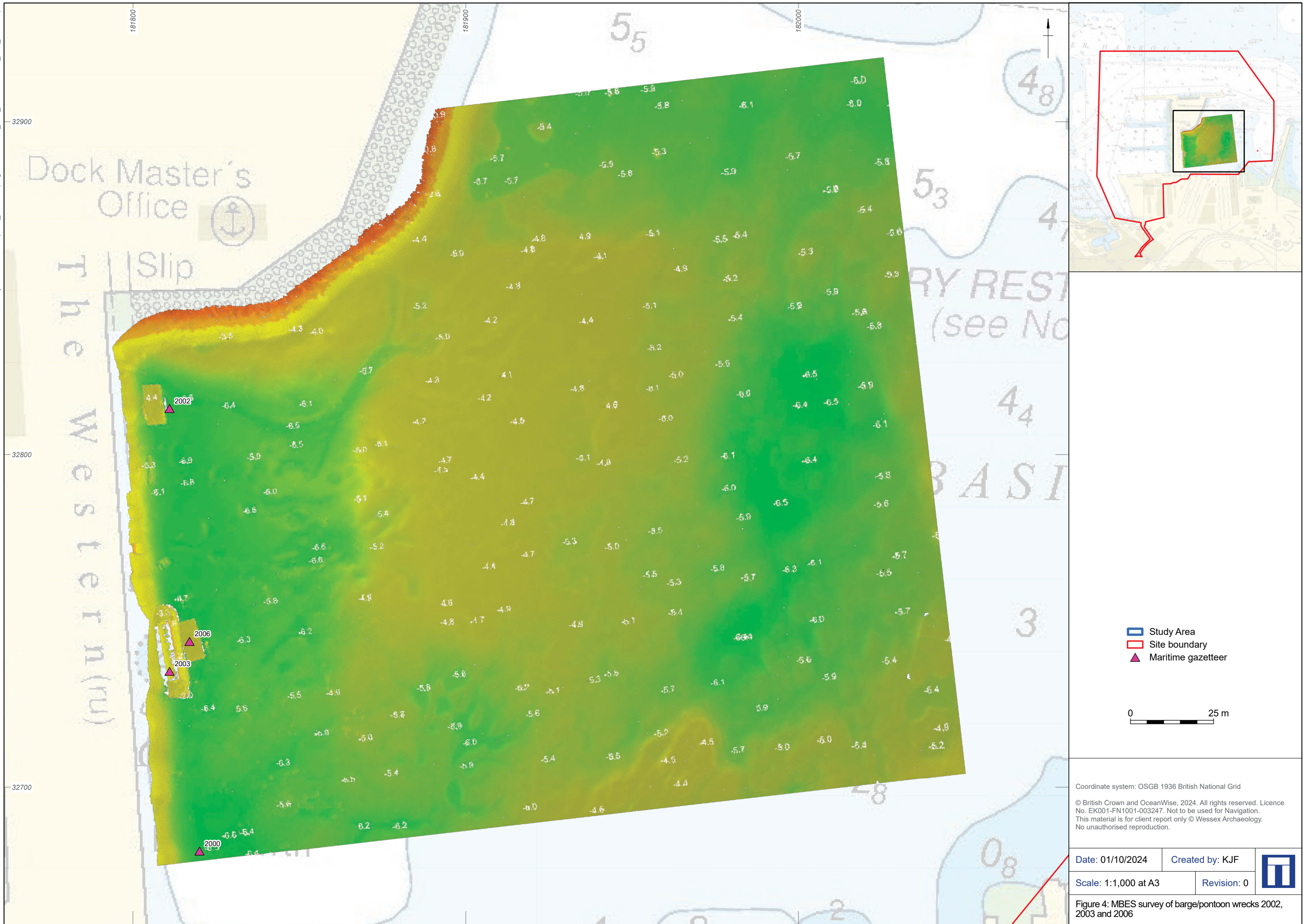
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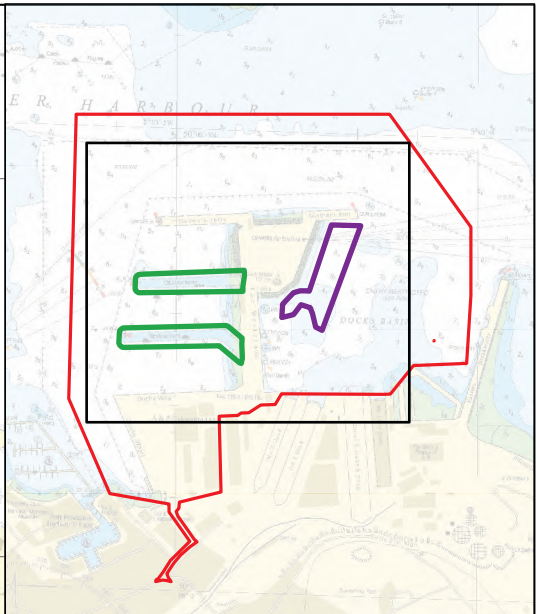
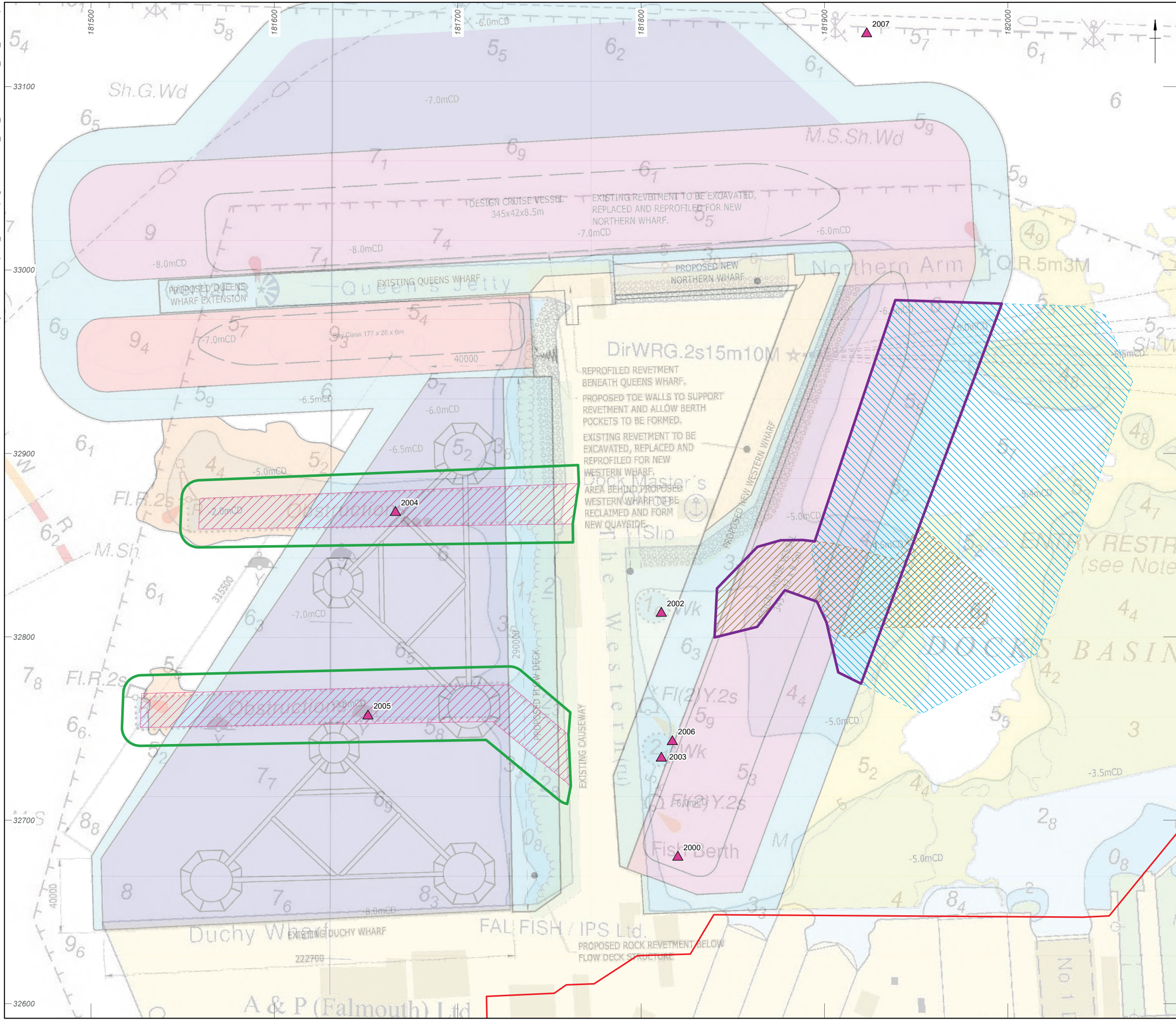
Coordinate system: OSGB 1936 British National Grid

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- Site boundary
- Dredging Watching Brief Areas
- Dredging Watching Brief Area - Geoarchaeology
- Maritime gazetteer polygons
- Maritime gazetteer
- 7001 - Palaeochannel
- 7002 - Peat Deposit

Proposed dredge plan (Ramboll UK Ltd)

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32,945m³
- Graded sides:
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122,506m³
- Remove obstructions from demolished timber jetty -6.0m CD:
5,501m²
6,051m³
- Surface skim to maintain -5.5m CD:
46,653m²
26,646m³



Coordinate system: OSGB 1936 British National Grid

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Figure 5: Area of dredging Watching Brief around former King's and Empire Wharfs

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