Technical Appendix 2.2: EIA Scoping Opinion Report

Intended for
Falmouth Docks & Engineering Company

Date
August 2023

Project Number
1620012132-001

FALMOUTH DOCKS DEVELOPMENT
ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

CORNWALL COUNCIL
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FALMOUTH DOCKS DEVELOPMENT
ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

Project No.	**1620012132-001**
Issue No.	**7**
Date	**01/08/2023**
Made by	**Various**
Checked by	**Various, Julia Thompson**
Approved by	**Rachel Holloway**

Ramboll
240 Blackfriars Road
London
SE1 8NW
United Kingdom
T +44 20 7808 1420
www.ramboll.co.uk

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1. INTRODUCTION

1.1.1 Ramboll UK Limited ('Ramboll') has been commissioned by A&P Group (the 'Applicant') to prepare an Environmental Impact Assessment (EIA) Scoping Request (this 'EIA Scoping Report') for the proposed development at Falmouth Docks (the 'site'). The proposed development aims to restore and upgrade the existing facilities at the site whilst facilitating the offshore renewable energy industry through the provision of berth and deck facilities. The site and the works proposed are considered to be in the jurisdiction of Cornwall Council (CC) and the Marine Management Organisation (MMO).

1.2 Purpose of this Scoping Request

1.2.1 This EIA Scoping Report has been prepared for submission to CC to assist them in forming a scoping opinion under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] and for submission to the MMO to assist them in forming a scoping opinion under The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)[2]. The EIA scoping opinion will set out the information required in the subsequent Environmental Statement (ES) for the proposed development, described in more detail in Section 3.

1.2.2 This report explains our proposed approach to EIA, it reviews the possible environmental effects that may be associated with the proposed development and identifies those that are potentially significant and will therefore be assessed within the subsequent EIA. It also provides details of the methodologies that are proposed to be used to assess any potential effects.

1.2.3 It is intended that the EIA process will commence based on the scope defined within this report, unless otherwise dictated upon receipt of a scoping opinion from CC and/or the MMO. This report has been produced with the information available at the time of writing and using professional judgement to ensure that a robust and representative EIA scope is presented.

1.3 Report Structure

1.3.1 This report is structured as follows:

- Section 1 introduces the purpose of this EIA Scoping Report and a brief outline of the planning context;
- Section 2 provides the description of the site and immediate surrounds;
- Section 3 describes the proposed development;
- Section 4 explains the EIA process, including the scoping methodology, consultation, approach to cumulative effects and basis of the EIA;
- Sections 5-24 present a description of the possible effects on the environment for each environmental discipline considered relevant to the proposed development, identifying which effects should be assessed in the subsequent EIA and the proposed methodology for those environmental topics scoped in. Where relevant, justification for the environmental topics being scoped out of the EIA is provided; and
- Section 25 provides a summary of the scoping exercise, covering those topics scoped in for further assessment and a conclusion to the EIA Scoping report.

1 UK Government Legislation, 2017. Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, online. Available at: https://www.legislation.gov.uk/uksi/2017/571/contents/made
2 UK Government Legislation, 2007. Marine Works (Environmental Impact Assessment) Regulations 2007, as amended, online. Available at: https://www.legislation.gov.uk/uksi/2007/1518/contents/made

1.3.2 This EIA Scoping Report has been prepared in general accordance with the provisions of Regulation 15 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] and Schedule 4 of The Marine Works (Environmental Impact Assessment) Regulations 2007[2], as amended, as well as best practice methods. A summary of the requirements under paragraph (2) of Regulation 15 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 and paragraph (1) of Schedule 4 of The Marine Works (Environmental Impact Assessment) Regulations 2007 and demonstration of compliance is provided in Table 1-1.

Table 1-1: Compliance with Regulation 15 and Schedule 4 within this EIA Scoping Report

A plan or chart sufficient to identify the land/location of the regulated activities	Figure 2-1
A brief description of the nature and purpose of the development/regulated activities, including location and technical capacity	Section 3
An explanation of the possible/likely significant effects of the development on the environment.	Sections 5-24

1.3.3 Sections 5-24 have been prepared by the following organisations, with the appropriate professional and technical competencies:

HR Wallingford

- Coastal Processes and Sediment Regime
- Underwater Noise

Carcinus

- Marine Ecology
- Commercial Finfisheries and Shellfisheries

Wessex Archaeology

- Marine Archaeology
- Heritage

ABPMer: Navigation and Recreation

Tor & Co: Population and Human Health

Ramboll

- Marine Water and Sediment Quality
- Ground Conditions
- Flood Risk
- Terrestrial Ecology and Ornithology
- Transport
- Noise And Vibration
- Air Quality
- Climate Change
- Material Resources and Waste
- Landscape, Seascape and Visual Amenity
- Socioeconomics
- Major Accidents and Disasters

2. SITE DESCRIPTION

2.1 Site Location

2.1.1 The site is located in Falmouth, Cornwall, UK, centred on National Grid Reference SW 81765 32796. The location of the site is shown in Figure 2-1.

2.1.2 The immediate area surrounding the site comprises the following:

- North: The north of the site is surrounded by the Carrick Roads channel which lies immediately to the north of the site, leading to the English Channel. The Flushing headland lies approximately 500 m to the north.
- East: The A&P dry docks lie immediately to the east of the site, followed by the Pendennis Shipyard. The Eastern Breakwater is located approximately 430 m further east. Pendennis Castle lies approximately 1 km southeast.
- South: The Falmouth Docks operational buildings lie to the south of the site alongside the local road network and Falmouth Docks train station connecting Falmouth Docks to the wider town.
- West: Immediately to the west lies the National Maritime Museum Cornwall and a number of private marinas such as Port Pendennis Marina. A number of visitor moorings are also present adjacent to the site within Carrick Roads/ Falmouth Bay area. The St Mawes-Falmouth ferry service runs adjacent to the site along the west and north. Falmouth town and residential area lies further west of the site.

Figure 2-1: Site Location, Ramboll 2022

2.2 Site History and Description

2.2.1 The site (Falmouth Docks) is built on the northern shore of Pendennis Point, on the estuary of the River Fal which is also known as Carrick Roads. The site is the third largest natural harbour in the world and the deepest in Europe. On the southern side of the docks are Falmouth Docks Railway Station and the terminus of the A39 road. The site is approximately 75 hectares (ha) and is occupied by A&P who act as the Falmouth Docks and Engineering Company (FDEC) under the Falmouth Harbour Act and Orders 1870-1991[3].

2.2.2 At the time of the first Falmouth Docks Act in 1859, the site for the docks was in a natural state comprising low cliffs, foreshore and seabed with no previous industrial use. Development started with foundation stones and a number of buildings along with the no. 1 and no. 2 dry docks, opening in 1862 and 1863, respectively. No. 3 and no. 4 dry docks were opened in 1921 and 1926, respectively. Construction of the wharves began from the 1930s with the Empire and Kings Wharves. The site was developed to almost the present layout by 1969. Pendennis Shipyard began to use No. 1 dry dock from 1981 effectively removing this as an asset for use by FDEC. A fire in 2003 damaged the Queens Wharf timber requiring new steel piles and a reinforced concrete deck to repair. The Empire and Kings Wharves were removed by 2008.

2.2.3 The site is now a centre of excellence for Ministry of Defence vessels, ferries, mobilisation and demobilisation works, jack-ups, pontoons and tankers. A&P Falmouth is also a busy working port, handling over 100,000 T of product annually. This helps to support a strong and local supply chain offering a wide range of services including towage, ship's agency, area port health, diving services, local surveyors and tank washing. The three dry docks support the strong marine repair industry at the site.

2.2.4 The Carricks Road channel is the determining factor in vessel movements and vessel size, with a channel depth of 5.4 m Chart Datum (CD) at Mean High Water Springs (MHWS). Falmouth Docks operates frequent cruise and cargo operations alongside facilitating Ministry of Defence (MoD) vessels for the majority of the year.

2.2.5 The docks run from a relatively thin central causeway which leads from the main dockside through to the operational Queens Wharf (190 m, 6.5 m draft) and Northern Arm area to the north of the site – there is a section of open revetment between the Queens Wharf and Northern Arm. There is also a berth to the South of Queens (135 m, 6 m draft). To the west of the central causeway are the Duchy and County Wharves (202 m, 8.5 m draft and 180 m long, 8.5 m draft, respectively) to the east of the central causeway is the former Western Wharf which is no longer in operational use due to safety concerns. Two former wharves, Empire Wharf and Kings Wharf, were removed in 2008, however the footprints of these structures remain as foul ground on the seabed creating shallow water areas. See Figure 2-2 for the current layout of the site.

[3] UK Legislation: Statutory Instruments, 1991. The Falmouth Harbour Revision Order 1991, No. 1853, online. Available at: https://www.legislation.gov.uk/uksi/1991/1853/made

Figure 2-2: Site Layout

2.2.6 The easternmost extent of the Northern Arm is an old concrete structure with a steel gang walkway connecting this structure to the main dock area. A section of old timber piles is present to the west of the concrete structure beneath the gang walkway. This structure has limited operational use and is understood to create a navigational obstruction for vessels entering and leaving the docks.

2.2.7 The County and Duchy Wharves are old structures and are reaching the end of their design life. They remain structurally sound but fender pile deterioration and damage, due to age and incidents, have occurred.

2.2.8 Parts of the site are considered to be in poor condition with structural failures occurring to the central causeway and the Western Wharf, the latter of which is unsafe and not in operational use. The timber piles used to construct the former Western Wharf have failed due to washout and are considered to be beyond economic repair and should be replaced. As a result of the failures to the eastern side of the causeway, the causeway itself is subsiding and the western wall adjacent to the Duchy Wharf is overturning and experiencing rotational failure and cracking. Due to these structural concerns, the causeway is at risk of failure which would prevent access to the northern areas of the site and cease operational capacity at Falmouth Docks. Presently, loading restrictions of 100 tonnes are in place along the causeway which restricts the cargo access and movements that would otherwise be possible.

2.2.9 See Figure 2-3 to Figure 2-8 for photos of the site, demonstrating the condition of certain structural elements as described within this section.

Figure 2-3: Northern Arm Concrete structure, looking north, Ramboll image 2022

Figure 2-4: Timber Piles and Gang Walkway adjacent to the Northern Arm, looking north, Ramboll image 2022

Figure 2-5: Western Wharf, looking northwest, Ramboll image 2022

Figure 2-6: Western Wharf Condition of Timber Piles, looking west, Ramboll image 2022

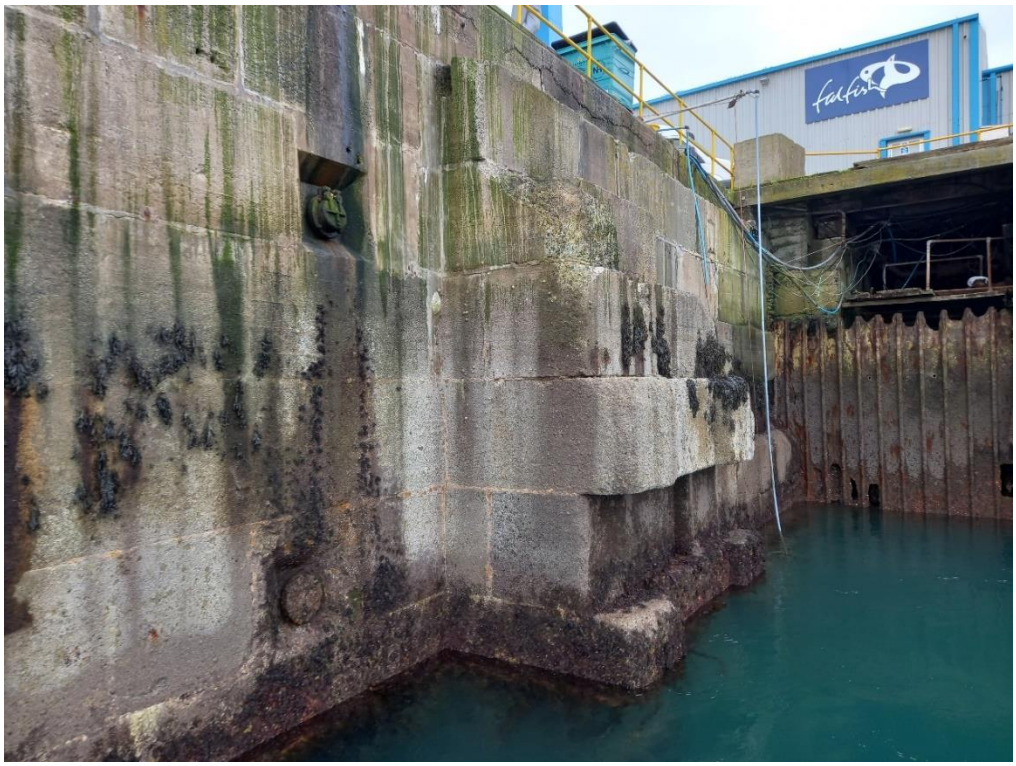

Figure 2-7: FalFish Site at the southern end of the Western Wharf, looking west, Ramboll image 2022

Figure 2-8: Structural failure to the west of the Central Causeway, looking east, Ramboll image 2022

2.3 Current Site Uses

2.3.1 In its current condition, the site is able to serve a number of industries including ship repair, commercial cargo shipping, cruise and military vessels although the limited berth capacity creates conflicts between these uses.

Commercial Cargo and Operations

2.3.2 The site is an important export site for glass recycling collected from the wider county of Cornwall. Glass is currently stored in in open bulk cargo bays on the corner of land behind the County and Duchy Wharfs, the safe loading of cargo requires approximately 18 m deck width for gangway, loading and crew to load the glass cargo onto the vessel safely. The Duchy Wharf is therefore the preferred berth to use for cargo vessels. Under current berth conditions and conflict availability, the site is unable to meet the export targets for this glass. There are extended periods of time throughout the year during which the Duchy and County wharfs is in use by other vessels, such as RFA vessels, and cargo cannot be exported.

2.3.3 The site is also a significant export location for local granite quarried from surrounding areas; the quarry is understood to have long-term planning permission in place and so this demand is not anticipated to reduce in the future. The current loading capacity of the wharves is restricted and therefore limits the availability for certain cargo vessels which require a minimum tonnage specification in order to unload heavy project cargos.

2.3.4 These cargo operations often require significant amounts of landside deck space to operate from, including sufficient loading capacity of these areas. The aspiration for the proposed development is therefore to have a dedicated cargo berth with sufficient landside space, capacity and facilities that can be prioritised for these activities while not disrupting the other essential port services.

2.3.5 A number of commercial operations are based at the site, including FalFish commercial fisheries and fish landings which are proposed to be maintained as part of the site redevelopment. The ship repair industry is a critical service that the site is able to provide at alongside berths in addition to the dedicated dry dock facilities.

2.3.6 The site also serves other essential functions for the county and southwest, for example it is a port of refuge and provides berths for port tugs. The site also hosts international public events such as Falmouth Tall Ships and the Armed Forces Day.

Cruise Vessels

2.3.7 County Wharf is currently used as the primary cruise berth within the cruise season (between 01 April and 31 October inclusive). However, berth availability and berth size are currently restricting factors. The Port can accommodate cruise ships alongside, or alternatively cruise vessels anchor in the sheltered bay and are transited into Falmouth; however, this is not a preferred option due to the difficulties transit calls present.

2.3.8 The site serves as a frequent cruise destination throughout the cruise season; at present approximately eight to nine vessels visit the site per month throughout the season. Vessels do not often stay in Falmouth for longer than 24 hours, and many arrive on the morning tide and depart on the evening tide. The presence of cruise in Falmouth is supported by the council, as it reduces pressures on local accommodation, healthcare, waste services, energy and road networks (as these services are all managed and maintained on board) while securing consistent tourist footfall in the town and wider county; each vessel brings 2,000-2,500 passengers to the local area and the

visits are generally planned at least one year in advance giving the tourist attractions time to plan for these seasonal peaks. The size of modern cruise vessels is increasing, and the applicant needs to ensure that these vessels can be safely berthed in order to maintain a Falmouth stop within cruise itineraries.

2.3.9 The County and Queen Wharves are used as the predominant cruise berths due to their size and depth, however conflicts for these berths are present due to the MoD contract in place for RFA vessels to use Falmouth. These RFA vessels are understood to berth at the site for prolonged time periods which results in limited berth capacity for other vessels.

2.3.10 Since the COVID-19 pandemic and the restart of cruise activities in July 2020, the capacity within the sector has gradually grown, and the latest industry updates project that passenger volumes will recover to 101% of 2019 levels by the end of 2022 and by 2026 passenger volumes are anticipated to be 12% above 2019 levels[4].

2.3.11 The aspiration for the proposed development with respect to cruise vessels is to maintain a designated cruise berth (or berths where available) while maintaining other essential ship repair, cargo and existing MoD operations. Upgrades to the site to support larger cruise vessels are considered the minimum requirement in order to maintain business as usual operations in the current era; the site was constructed at a time when cruise vessels were smaller and the need to upgrade is a response to the direction of vessel size increases globally.

Renewable Energy Infrastructure

2.3.12 The site is considered to be a prime location for renewable floating offshore wind (FLOW) due to its proximity to the Celtic Sea and other offshore wind sites such as Hayle which are within the 72-hour weather forecasting window required for FLOW and towing distances. In addition, the site is well suited to serve as a base for FLOW operation and maintenance services. Vessels that support offshore wind development are currently understood to use the site, notably at the Queens Wharf and Northern Arm. The aspiration for the proposed development is to support FLOW and make use of the site's location in proximity to the WaveHub site off the coast of Hayle, Cornwall, which is to be used by Twinhub to install the first floating offshore wind technology into the Celtic Sea. The floating offshore wind devices are large and require significant quayside areas with good mooring loading capability.

2.3.13 In 2020, the UK government increased the 2030 offshore wind target set by the Offshore Wind Sector Deal from 30 gigawatts (GW) to 40 GW, with at least 1 GW coming from FLOW. Allocation Round 4 consent has recently been given to the TwinHub FLOW device, with a possible assembly and maintenance base at Falmouth due to its location and facilities. The complex leasing arrangements in place for FLOW will challenge port infrastructure and associated upgrades required to support the ongoing maintenance of FLOW devices. Along with challenges to the wider supply chain in the southwest. The proposed development seeks to respond to this need and provide the required port infrastructure to support assembly. Demand for FLOW and port infrastructure is only considered to increase in the future to support net zero targets.

4 Cruise Lines International Association, 2022. Economic Impact Studies: State of the Cruise Industry Outlook 2022, online. Available at: https://cruising.org/en-gb/news-and-research/research/2022/january/state-of-the-cruise-industry-outlook-2022 [Accessed 12/09/2022]

3. PROPOSED DEVELOPMENT

3.1 Overview

3.1.1 The proposed development would redevelop and modernise the existing facilities at Falmouth Docks to reinstate full alongside berth capability. The objectives of the proposed development are to repair and update the currently poor condition port infrastructure in order to maintain existing business (including essential ship repair) and future proof the port with respect to three main areas: cruise capacity, cargo capacity and FLOW (supporting the offshore wind market).

3.1.2 In order to support these areas, the following redevelopment activities are considered to be required:

- 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;
- suspended deck structure in the existing 90 m gap between Queens Wharf and Northern Wharf to create a longer functional wharf length;
- 50 m westward extension of the Queens Wharf suspended deck structure;
- potential installation of a 300 m deck (the 'FLOW Deck') alongside the western edge of the causeway to facilitate the FLOW device;
- 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. This includes removal of foul ground within areas of the former Kings and Empire Wharves;
- surface skim of seabed on eastern side of the site to maintain -5.5 m CD; and
- upgrade of dockside facilities to modernise the docks and provide shore power.

3.1.3 An overview of the concept design general arrangement is shown in Figure 3-1, which is considered to present a worst-case design at this stage of the design evolution. Concept design drawings for each section of the proposed development are provided in Appendix 4A.

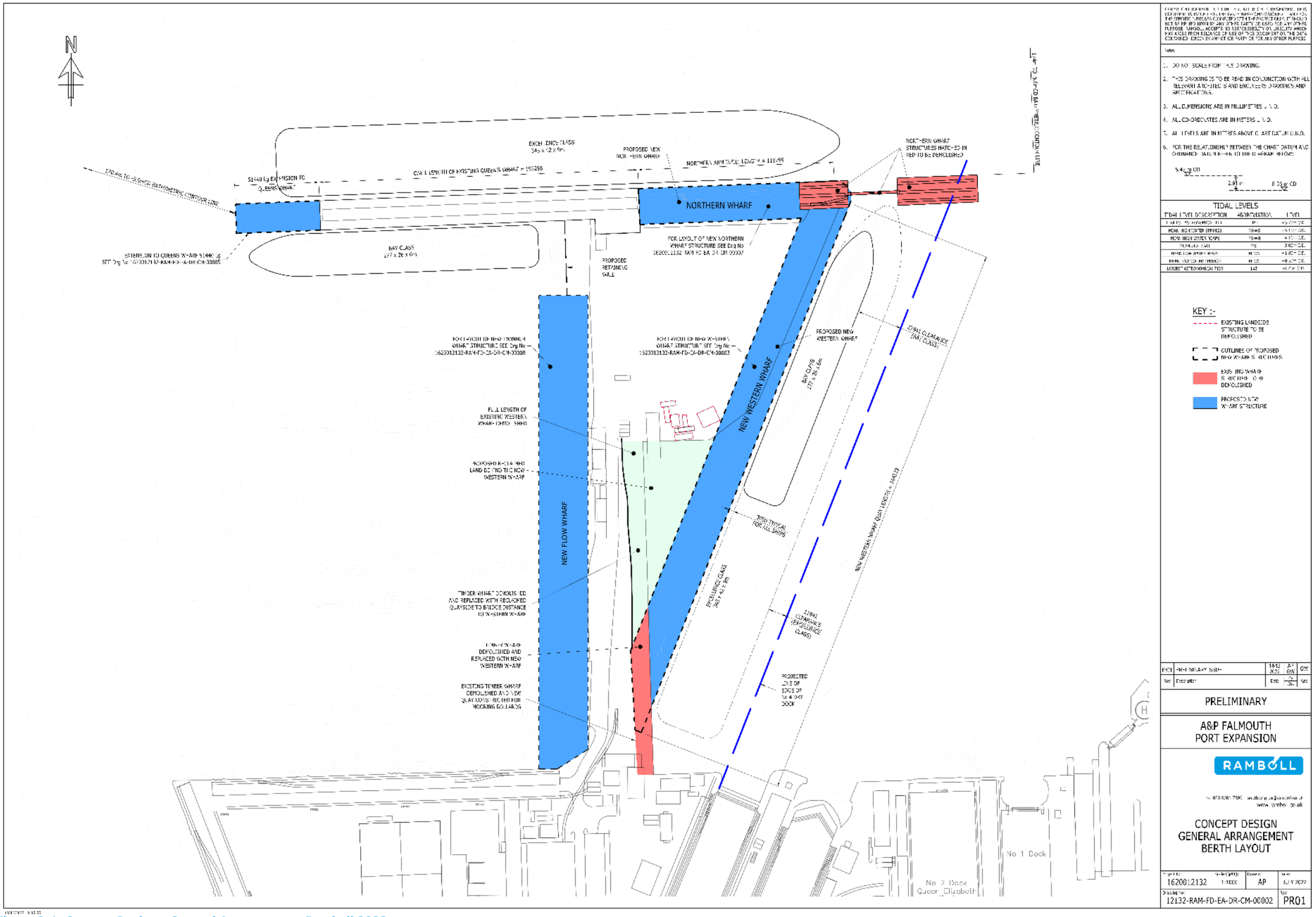

Figure 3-1: Concept Design - General Arrangement, Ramboll 2022

3.2 Concept Design Development

3.2.1 The concept design to date has been developed to avoid environmental effects and minimise the footprint of the development where possible, including minimising dredge pockets, whilst ensuring that at EIA scoping stage, a worst-case footprint is considered. Alternatives workshops have been held with the client team, environment team and engineers to optimise the concept design and ensure that environmental considerations have driven decisions. The design is also subject to hydrodynamic assessments to facilitate the detailed design evolution. A number of initial stakeholder workshops have been held with MMO, Natural England (NE) and the Environment Agency (EA) to seek initial feedback on the concept design.

3.2.2 Feedback received during the scoping process and a series of stakeholder engagement events will inform ongoing development of the design. Detail of these and alternatives considered will be included in the ES.

3.3 Western Wharf Demolition and Reconstruction

3.3.1 The existing Western Wharf structure is considered to be in a condition beyond repair and therefore is proposed to be replaced. The remaining structures will be demolished, and the seabed in the vicinity excavated to ensure the structural stability of the new deck construction.

3.3.2 The new wharf is anticipated to be constructed in a similar manner to existing structures at the site, with a suspended deck above a revetment. The area behind the wharf will be reclaimed to increase the functional area of the causeway deck area. The existing fish landing at the southern corner of the Western Wharf is anticipated to be retained as part of the proposed development. Some buildings may need to be relocated and commercial operations rehoused as part of the proposed development. The proposed Western Wharf is proposed to wrap around the north-eastern corner of the site to provide a continuous deck surface. A new name for the wharf may be developed at a later stage. Refer to Appendix 4A for the Western Wharf general arrangement, and for the proposed Western Wharf sections.

3.4 Northern Arm Demolition and 90 m Suspended Deck Construction

3.4.1 The isolated concrete structure at the easternmost extent of the Northern Wharf is proposed to be demolished to return this area of the site to open channel. The timber piles and gang walkway that connects the section to the main wharf structure are proposed to be removed to facilitate the construction of the new Western Wharf wrap around deck. Refer to Appendix 4A for the Northern Wharf general arrangement.

3.4.2 The 90 m section of open revetment between the Northern Arm and Queens Wharf is proposed to be converted to a suspended deck structure to provide a longer continuous deck surface along Queens Wharf. The suspended deck construction alongside the removal of the Northern Arm will create a single, larger berth at the northernmost extent of the site, hereafter referred to as the Queens Wharf.

3.5 Queens Wharf Extension

3.5.1 A westward extension to the Queens Wharf deck surface is proposed to increase the length of operational deck by up to 50 m to facilitate larger vessels along this berth. The deck will be of a similar design to the existing Queens Wharf suspended deck. Refer to Appendix 4A for the general arrangement and for the proposed Queens Wharf sections.

3.6 FLOW Deck Construction

3.6.1 In order to facilitate the FLOW devices and future FLOW requirements, a new suspended deck continuous quay option is being explored at the concept design stage, as shown in Figure 3-1. The deck would be designed in a similar way to those already included as part of the proposed development, with a suspended deck and steel piled structures. The FLOW Deck would be constructed along the western edge of the central causeway running from the southernmost corner between the causeway and Duchy Wharf approximately 300 m in length and 30 m wide. This feature has not yet been confirmed however has been included within the scoping report as a worst-case design scenario. The deck has been proposed to facilitate the crane movements required to assemble the FLOW devices and to avoid clashes with vessels and other operations.

3.7 Pocket Dredge

3.7.1 The site requires pocket dredging to be undertaken in order to achieve the required bed depths and underkeel clearances associated with the various vessels that would use the site. At this stage of the concept design, detailed dredge requirements are not finalised however an indication of the operational requirements and worst-case associated dredge requirements has been provided in Figure 3-2. These dredge depths are to the clear draught of the design vessel with an additional 1 m underkeel clearance at Lowest Astronomical Tide (LAT) and 300 mm siltation allowance.

3.7.2 The proposed Western Wharf, Queens Wharf and FLOW mooring area require depths of -10.5 m CD in order for the Excellence class cruise vessels and FLOW to access and use these berths. To the South of Queens, dredge pockets of -10.5 m CD are required to facilitate the Bay Class vessels to berth here. This is alongside the removal of the foul ground in the locations of the former King and Empire Wharves. The sides of these pockets are proposed to be graded.

3.7.3 Alongside seabed material dredging, areas of rockhead were identified within geophysical surveys of the site location within the proposed berth pocket. Geophysical surveys indicate that rock material will be dredged and removed to the required depth to facilitate the proposed development.

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Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:

5.45 m OD
2.91 m
8.36 m CD

HIGHEST ASTRONOMICAL TIDE	HAT	+3.77m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.12m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.12m C.D.
MEAN SEA LEVEL	MSL	+3.66m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.82m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.52m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	0.23m C.D.

- 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: 5,551m² 6,051m²
- Surface skim to maintain -5.5m CD: 46,693m² 26,646m³

- The port layout is under development and there are a number of known issues.
- The dredge area shown is based on the concept design in progress.
- Volumes shown are approximate and are based on an average depth to each contour area.
- Dredge depths noted are to the clear draught of the design vessel + 1m underkeel clearance + 300mm siltation allowance.
- Scour protection required at additional depth.

Rev	Description	Date	By	Ap'd
PR02	DREDGE DEPTH REVISED	20/04 2023	SPF AP	GW
PR01	PRELIMINARY ISSUE	14/12 2022	SPF AP	GW

PRELIMINARY

A&P FALMOUTH PORT EXPANSION

RAMBOLL

t: 023 8061 7500 southampton@ramboll.co.uk www.ramboll.co.uk

CONCEPT DESIGN GENERAL ARRANGEMENT DREDGE PLAN

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1500	SPF	SEPT 2022
Drawing No: 12132-RAM-FD-EA-DR-CM-00010			Rev: PR02

Figure 3-2: Pocket Dredge Plan, Ramboll 2022

3.8 Construction Phasing

3.8.1 It is anticipated that the site will be redeveloped in a phased approach to maintain current operations throughout. The details of construction phasing will be developed throughout the detailed design. At this stage the Western Wharf and works to the central causeway are considered to be the priority to ensure the structural stability of the site and therefore are likely to be undertaken first. Although, the potential use of the site by TwinHub is also understood to have the strongest programme constraints as stipulated by the TwinHub programme, therefore the development of the site may be sectioned to facilitate development of the two priority areas. These details are subject to confirmation and will be presented within the ES and used to inform the assessment of effects. Details will include a breakdown of each agreed phase of construction, detail of the works that would be undertaken as part of each phase, an estimated duration of each phase, and detail of any mitigation measures specific to a particular phase that would be implemented.

3.8.2 Where there is uncertainty relating to elements of the proposed development worst case assumptions will be made within the ES. Where applicable any assumptions made will be identified within individual the topic areas.

3.8.3 Concept design drawings are included within Appendix 4A, including cross sections of each part of the proposed development as described within this section.

4. EIA PROCESS AND APPROACH

4.1.1 EIA is a process which provides information about certain proposed developments and their likely effects on the environment. The EIA not only identifies likely significant effects (adverse and beneficial), but also identifies appropriate methods to mitigate any adverse effects that may arise. The EIA process consists of a number of defined steps, of which the screening and scoping stages form a part. The EIA process is shown in the schematic diagram in Figure 4-1.

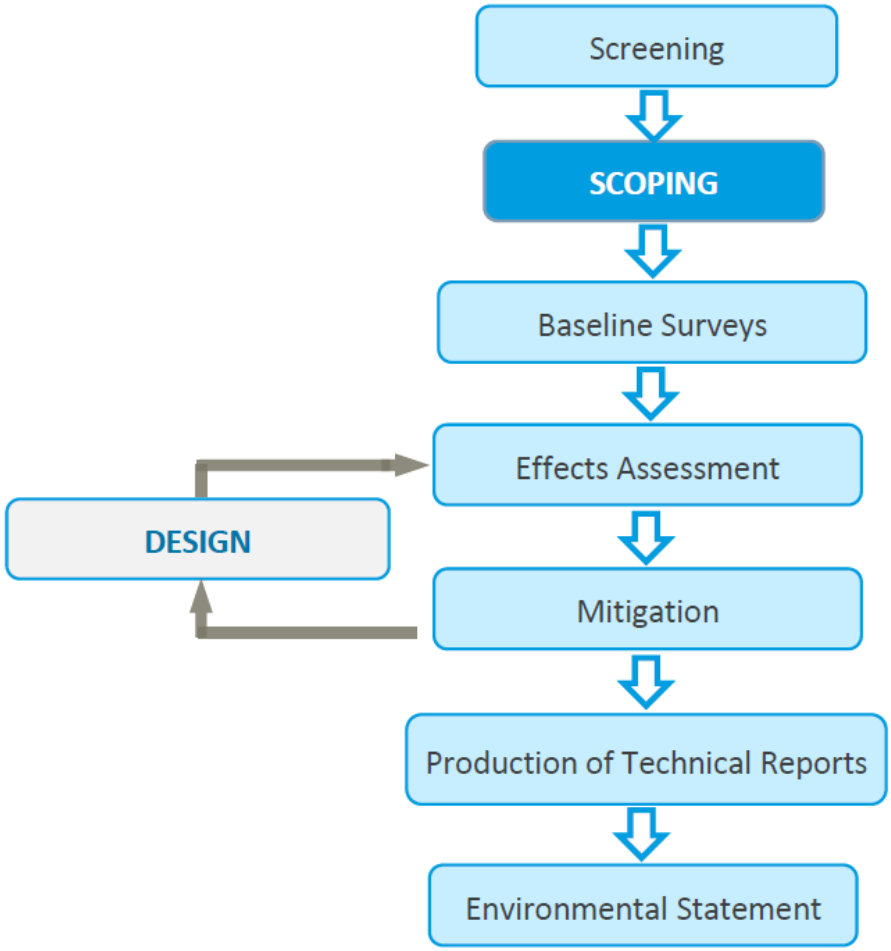


Figure 4-1: EIA Process Schematic

4.2 Screening

4.2.1 The EIA Regulations requires that for certain types of development an EIA must be undertaken before planning permission can be granted. The EIA Regulations set out the types of development which must always be subject to an EIA (Schedule 1) and other developments, which may only require an EIA where they are likely to have a significant effect on the environment by virtue of factors such as their nature, size or location (Schedule 2 developments).

4.2.2 Under the Town and Country Planning and Marine EIA Works legislation, the proposed development is considered to be a Schedule 1 8(2) and Schedule A1 (14) development, respectively, as the site is a trading port which can take vessels over 1,350 tonnes. An EIA is therefore required for the proposed development.

4.3 Scoping

4.3.1 The primary purpose of this EIA Scoping is to define the extent of the EIA, ensuring that only the likely significant environmental effects are carried forward to the assessment. This enables the EIA to be focussed on the most important environmental issues and to be proportionate to the proposed development.

4.3.2 In this EIA Scoping Report, a preliminary assessment of the significance of each potential effect has been undertaken in order to decide which of the effects could be significant and therefore should be 'scoped in' and assessed in the subsequent EIA. The significance of any effect has been preliminarily assessed in terms of the relationship between two factors:

i. The magnitude of the potential impact (including direct or indirect effects), including the consideration of duration and reversibility; and
ii. The importance of the receptor (the entity that is vulnerable to the effect), in terms of its value and sensitivity to the effect.

4.3.3 The EIA Regulations provide the applicant with the opportunity to seek a scoping opinion from the relevant planning authority, which formally confirms the information that should be contained within the ES.

4.4 Consultation

4.4.1 Formal consultation on the scope of the EIA is undertaken via submission of this Scoping Report to the planning authority under the provisions of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 and the MMO under the provisions of the Marine Works EIA Regulations, 2007 (as amended) to obtain a scoping opinion.

4.4.2 During the preparation of the EIA further consultations will be held with statutory consultees and other stakeholders to inform the methodologies used in the assessment, and to discuss the outcomes of the EIA and any proposed mitigation measures.

4.4.3 If consultation has been undertaken as part of the scoping, this is outlined in the relevant topic sections of this report.

4.4.4 Details of all consultation and how this has informed and influenced the environmental assessment and the design of the proposed development will be presented in the ES. The ES will demonstrate consideration of the points raised by statutory consultees and provide a table summarising their scoping responses and how they are considered in the ES.

4.5 Assessing Effects and Determining Significance

4.5.1 The EIA will assess the effects that are likely to arise as a consequence of a potential impact/change to environmental receptors following the application/consideration of embedded mitigation measures. Throughout the ES the same terminology will be used to describe these individual effects, unless specific alternative terminology exists in recognised issue specific guidance the range of effects is presented in Appendix 1, Table 1.

4.5.2 Within the ES, significance will be evaluated with reference to definitive standards, accepted/ published criteria and legislation (where available). Where it is not possible to quantify potential impacts and residual effects, qualitative assessments will be carried out, based on expert knowledge and professional judgement. Where uncertainty exists, it will be noted in the relevant

assessment and a conservative approach adopted so that the significance will not be under-estimated.

4.5.3 The specific criteria used to determine the magnitude and sensitivity of receptors will be defined in each of the technical ES chapters where possible a consistent matrix will be used to determine effects (refer to Appendix 1, Table 2). Throughout the ES, effects will be predicted as either 'significant' or 'not significant'. Significant effects are considered material to the consenting decision-making process.

4.6 Reasonable Alternatives

4.6.1 The relevant terrestrial and marine legislation and policy framework guidance state that the ES should include a description/ outline of the main and reasonable alternatives assessed (for example in terms of development design, technology, location, size and scale), and an indication of the main reasons for selecting the chosen option, taking into account the environmental effects associated with the alternatives.

4.6.2 The Institute of Environmental Management and Assessment (IEMA) provides guidance in terms of the best practice consideration of alternatives with respect to:

- Alternative locations;
- Alternative scales of development;
- Alternative site layouts and access arrangements;
- Different approaches to scheme design; and
- Alternative processes and alternative phasing of construction.

4.6.3 The above alternatives will be reported on in the ES, along with consideration of the 'Do Nothing' scenario.

4.7 Cumulative Effects

4.7.1 The requirement to refer to the cumulative effects of a proposed development is included in Schedule 4 of the Town and Country Planning and Marine Works EIA Regulations. The EIA will consider other projects which have the potential for cumulative effects. No specific criteria exist for determining those projects which may have cumulative effects.

4.7.2 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration is also given to the cumulative effects which might arise from the proposal in conjunction with other existing and/or approved development proposals in the vicinity. The following two types of Cumulative Effects will be considered within the ES:

- **Intra-Project** effects of different types of impact from the proposed development on particular receptors at or surrounding the site. Potential impact interactions include the combined effects of noise, dust and visual impacts during construction of the proposed development on a particular sensitive receptor; and
- **Inter-Project** effects which are combined effects generated from the proposed development with other existing and/or approved developments. These other developments may generate their own individually insignificant effects but when considered together could amount to a significant cumulative effect, for example, combined townscape and visual impacts from two or more (existing and/or approved) developments.

4.7.3 To ensure that Inter-Project (in-combination) cumulative effects are assessed as comprehensively and realistically as possible, the EIA would consider other projects which follow the following criteria:

- Development proposals for which planning permission or a marine licence has been granted (e.g. resolution to grant issued or signed legal agreement); *and*
- Located within the zone of influence of the site or likely to have cumulative effects within the water environment; and
- 10,000 m^2 Gross External Area (GEA) in floor area or would give rise to >150 residential units or relevant large-scale infrastructure projects.

4.7.4 For approved projects where reserved matters applications have been submitted pursuant to an outline consent, the outline consent will be considered to represent the 'worst-case'. For approved projects which have had subsequent amendments (minor and non-material), the latest known iteration will be considered within the EIA.

4.7.5 Identified approved projects are presented in Appendix 2 and will be agreed with the LPA and MMO. These projects listed in Appendix 2 will be quantitatively assessed on a topic-by-topic basis, subject to the availability of scheme information in the public domain. Where information is not available, a qualitative assessment will be undertaken. The results of the inter-project cumulative effects will be presented in each of the technical assessment chapters of the ES.

4.8 Mitigation Measures, Enhancements and Residual Effects

4.8.1 Should the assessment identify any likely significant environmental effects, appropriate additional mitigation measures will be recommended to prevent, reduce or remedy these. Any required additional mitigation measures will be identified during the detailed design process and incorporated into the construction and design of the proposed development; these will be known as embedded mitigation. If effects cannot be avoided or reduced via embedded mitigation, it may be appropriate for compensatory measures to be put in place as part of the scheme, for example to provide replacement habitat or additional flood plain capacity. Where appropriate, the measures to be used in mitigation will be developed in consultation with statutory organisations and/or other third parties.

4.8.2 The effectiveness of embedded mitigation measures will be assessed, and the residual effects detailed in the ES together with any monitoring required to report the effectiveness of the mitigation. Through inputs into the design and discussion between the EIA Team and the Design Team an integrated approach will be taken to ensure that embedded mitigation and enhancement measures are consistent and compatible across the technical topics and provide the best solution to managing environmental effects from the proposed development overall.

5. COASTAL PROCESSES AND SEDIMENT REGIME

5.1 Introduction

5.1.1 This section summarises the potential environmental impacts and likely effects that are presently anticipated to arise in connection with all stages of the proposed development relating to coastal processes in the area. This includes changes to the hydrodynamics (tides, currents and waves) of Falmouth Harbour and consequential effects on the transport of sediments and patterns of erosion and accretion throughout the Harbour both in the intertidal and subtidal areas.

5.1.2 The EIA will include a review of the existing coastal processes within the study area and assesses the impact of the demolition and construction stage and completed development stage on tides, waves, sediment transport and morphological change (erosion/accretion). The identified changes will be assessed in the context of the ongoing patterns of coastal change including natural variability and trends associated with climate change over the design life of the project, as assessed within Section 19: Climate Change.

5.1.3 Understanding the changes associated with the project on coastal processes will also feed into other assessments of the project such as water and sediment quality, flood risk, marine ecology, and ornithology. The scope of these topics is covered in subsequent sections of this EIA Scoping Report.

5.2 Site Information and Baseline Conditions

Hydrodynamics

5.2.1 The tide in Falmouth Harbour is semi-diurnal with two high waters and low waters every day. The standard water levels are scribed in the Admiralty Tide Tables[5] as listed in Table 5-1. The mean spring tide range is 4.6 m CD which puts the harbour into the macrotidal[6] classification.

Table 5-1: Tide level for Falmouth (UKHO, 2022)

Description	Level (m Chart Datum)	Level (m Ordnance Datum (Newlyn))
Highest Astronomical tide	5.7	2.8
Mean High Water Spring tide	5.1	2.2
Mean High Water Neap tide	4.1	1.2
Mean Sea Level	3.0	0.1
Mean Low Water Neap tide	1.8	-1.1
Mean Low Water Spring tide	0.5	-2.4
Lowest Astronomical tide	-0.2	-3.1

5 UK Hydrographic Office and Admiralty Maritime Data Solutions, 2022. Admiralty Tide Tables, online. Available at: https://www.admiralty.co.uk/publications/publications-and-reference-guides/admiralty-tide-tables [Accessed 07/10/2022]
6 Macrotidal locations have tide ranges greater than 4.0 m. Mesotidal sites have 2-4 m tide ranges and less than 2 m tide ranges occur in microtidal areas, from Dipper, F., 2022. Elements of Marine Ecology (fifth edition). ISBN 978-0-08-102826-1

5.2.2 River flows to Falmouth Harbour are small compared to the tidal discharges passing the study site. The river discharges, as summarised by the gauged river data available from the National River Flow Archive[7] are shown in Table 5-2.

Table 5-2: Gauged river flow data for rivers entering Falmouth Harbour

River Gauge location	Mean observed flow (m^3/s)	5% exceedance flow (m^3/s)
River Kennall at Ponsanooth	0.521	1.642
Carnon River at Bissoe	0.839	1.44
River Kenwyn at Truro	0.384	1.21
River Fal at Tregony	2.031	5.98

5.2.3 The hydrodynamic and sediment regimes of the estuary system are described in a previous study undertaken at Falmouth[8], as summarised below.

5.2.4 The above indicates that currents in the study area are dominated by the tidal filling and emptying of the harbour area. Currents are low close to the project site with peak spring tide currents less than 0.5 m/s (1 knot). Higher currents occur towards Carrick Roads and in particular around Pendennis Point where the flow in and out of the harbour meets the sea.

5.2.5 Wave conditions around Falmouth are a combination of offshore swell and locally generated wind-waves with the balance of the wave energies varying between offshore wave dominant in Carrick Roads to local wind generated waves in the inner reaches of the harbour.

5.2.6 The pattern of significant wave height within Falmouth Harbour due to offshore waves is broadly consistent from each offshore direction sector, with waves entering the Estuary and splitting to the northeast and northwest. The project site itself is sheltered from the largest offshore waves. Previous modelling studies have predicted significant wave heights along the Falmouth town quay, to the west of the development site, of 0.6 m for a 1-year return period wave entering the harbour from the south.

Sediments and Morphology

5.2.7 The distribution of hydrodynamic forces described above leads to a mixture of sediment types present in the harbour area. The higher energy areas in Carrick Roads contain sand and gravel with some fine sediments at the margins. The coarser sediment are most likely marine sediments transported into the estuary from Falmouth Bay. Moving into the river estuaries, the bed sediments become progressively finer. Some of the fine material found in the landward areas is thought to come from the historic release of mining waste[9].

5.2.8 Suspended sediment concentrations in the harbour are generally low, less than 10 ppm[10]. Some elevated suspended concentrations can occur by re-suspension of fine sediment from the bed during wave events. A local increase in suspended sediment concentration is seen in the northern

7 UK Centre for Ecology and Hydrology, 2022. National River Flow Archive, https://nrfa.ceh.ac.uk/data/search
8 HR Wallingford, 2008. Falmouth Cruise Terminal. Hydrodynamic and sedimentary studies. Report EX 5809
9 ABPmer, 2009. Cornwall SMP2: Fal, Camel and Fowey estuaries. Report R.1558
10 HR Wallingford, 1985. Proposed Container Terminal at Falmouth. Field Data Collection. Report EX 1333

areas of the harbour, towards Truro, which is thought to be contributed to by discharges from the nearby sewage treatment works[11].

5.2.9 Areas of live and dead maerl, which is a carline algae, are known to occur in the harbour and contribute to the sediment regime of the area. See Section 9: Marine Ecology for further information on maerl distribution.

The generally low amount of sediment transport occurring means that the general form of Falmouth Harbour is broadly stable with the drowned river valley of Carrick Roads, the shallow platforms to the sides and the six main river estuaries feeding into the harbour. The inner estuaries have accreted historically due to mining waste discharge and other anthropogenic activities.

5.3 Potential Impacts and Likely Effects

5.3.1 The anticipated potential changes to physical coastal processes are changes to the following receptors:

- Water levels;
- Tidal currents;
- Wave heights;
- Patterns of sediment transport, expressed as changes to:
    - Suspended sediment concentration; and
    - Patterns of scour, erosion and accretion;
- Release of contaminants either dissolved within the water column or adsorbed to sediments; and
- Deposition of contaminants adsorbed to sediments.

5.3.2 These lead to potential effects upon the following receptors:

- Intertidal habitats (and related species that use these habitats), extent and function via changes to tidal levels, tidal currents, waves, patterns of erosion and accretion and deposition of released contaminants;
- Subtidal habitats (and related species that use these habitats), extent and function via changes to tidal currents, waves, patterns of sediment transport, patterns of scour, erosion and accretion and deposition of released contaminants;
- Water column, via changes to tidal currents, suspended sediment concentration and release of contaminants either dissolved or adsorbed to sediments; and
- Flood risk status of the site, via changes to water levels, waves, patterns of scour and erosion.

5.3.3 Table 5-3 and Table 5-4 present a summary of the scoping process, identifying which likely environmental effects, with respect to coastal processes, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

11 Marine Biological Association, 2003. Characterisation of European Marine Sites – The Fal and Helford (candidate) Special Area of Conservation. Occasional Publication No 8

Table 5-3: Potential Demolition and Construction Effects

Potential Effect	To be assessed in the EIA (Yes/No)	Reason
Increased suspended sediment concentration due to dredging and demolition	Yes	Environmental receptors, notably maerl habitats, are sensitive to increased turbidity, along with marine archaeological features.
Release and dispersion of contaminants into the water column during dredging and demolition.	Yes	Scoped in subject to results of sediment analysis for levels of contamination.
Increased fine sediment deposition due to sediment release from dredging and demolition.	Yes	Environmental receptors, notably maerl habitats, are sensitive to increased fine sediment deposition, along with marine archaeological features.
Deposition of contaminated fine sediment from dredging and demolition.	Yes	Scoped in subject to results of sediment analysis for levels of contamination.
Release, dispersion and fate of material placed at disposal site (at sea).	No	The volumes and types of material to be disposed of at sea will be dependent on the levels of contamination present and will be disposed of in accordance with the licence of the disposal site, both in terms of volume and contaminant levels. Beneficial reuse will be considered where practicable, and any contaminated sediment to the appropriate licenced waste facility. The effects are therefore unlikely to be significant.

Table 5-4: Potential Completed Development Effects

Potential Effect	To be assessed in the EIA (Yes/No)	Reason
Changes to water levels (tidal and surges) during operational life of scheme	No	Changes to the cross-sectional area of the harbour associated with the proposed development are too small to alter the propagation of tides or meteorological surges.
Changes to tidal currents during operational life of scheme	Yes	Potential for implications for navigation, fisheries, marine benthic ecology (via changes to erosion and deposition patterns, and potentially via a direct effect of a change in current speed on ecology present) and marine archaeology.
Changes to wave conditions during operational life of scheme	Yes	Changes to the form of the quay line may alter the wave reflection properties. Dredging a new berth pocket may result in changes to refraction of waves. These effects have implications for flood risk, marine benthic ecology (via changes to erosion and deposition patterns).
Changes to patterns of sediment transport during operational life of scheme.	Yes	Potential loss/change to inter and sub-tidal habitat function including maerl.

Potential Effect	To be assessed in the EIA (Yes/No)	Reason
Changes to patterns of erosion and accretion during operational life of scheme.	Yes	Potential loss/change to inter and sub-tidal habitat function including maerl. Potential need to undertake maintenance dredging leading to further fine sediment dispersion.
Scour close to structures during operational life of scheme	Yes	Potential loss of subtidal habitat.
Increased suspended sediment concentration during maintenance dredging.	Yes	Environmental receptors, notably maerl habitats, are sensitive to increased turbidity. Scoped in subject to the identification of the need for maintenance dredging for the deepened berths.
Increased fine sediment deposition during maintenance dredging.	Yes	Environmental receptors, notably maerl habitats, are sensitive to increased fine sediment deposition. Scoped in subject to the identification of the need for maintenance dredging for the deepened berths.
Release, dispersion and fate of maintenance dredged material placed at disposal site.	No	The volumes and types of material to be disposed of at sea will be dependent on the requirement for maintenance dredging and the levels of contamination present. Any sediment will be disposed of in accordance with the licence of the disposal site, both in terms of volume and contaminant levels. Beneficial reuse will be considered where practicable, and any contaminated sediment to the appropriate licenced waste facility. The effects are therefore unlikely to be significant and are scoped out in terms of hydrodynamic effects.

5.4 Approach and Methodology

5.4.1 The Coastal Processes component of the EIA will identify the nature of the effects upon on the coastal processes (hydrodynamics, sediment transport, morphological change) to which other marine receptors may be exposed to, from the proposed development. The aim will be to describe the effects on the physical environment, but not to assess the potential impacts on ecological receptors. These assessments will be provided in the appropriate chapters, for example, Section 6: Marine Water and Sediment Quality and Section 9: Marine Ecology.

5.4.2 Based on the level of studies undertaken previously the changes in the physical processes will be best identified by a suite of numerical models as follows.

- Tidal flow,
- Waves,
- Sediment transport for both fine cohesive sediments and non-cohesive sediment,
- Sediment plumes, potentially including adsorption and desorption of contaminants.

5.4.3 The models should cover the whole tidal area of Falmouth Harbour and estuaries to ensure the current tidal volume is being exchanged with the sea. The model area should cover a sufficient area of Falmouth Bay such that the model correctly simulates the flows and eddies as the flow accelerates around Pendennis Point. The model should also include nearby designated areas such as the Helford estuary. It would be advantageous for the offshore limit of the modelling to include enough area around the licensed disposal site in Falmouth Bay to allow modelling of sediment releases there (if required). A model extent of 15-20 km offshore extending 40-50 km along the coast is considered sufficient.

5.4.4 Detailed modelling will be required to represent the form of the existing and proposed port structures, including any dredge areas and to capture the correct cross-sectional area of the deep channel in Carrick Roads. Grid sizes in the range of 20-50 m are anticipated with a potential for further refinement near the port structures.

Sensitivity and Magnitude

5.4.5 Sensitivity criteria will be assigned using qualitative descriptors in Table 5-5. These criteria are based on the linkage each receptor has for other secondary (mainly ecological) receptors, and their natural degree of variability. Magnitude criteria are based on the extent and scale of change – these are necessarily qualitative owing to the wide range of conditions captured by each receptor.

Table 5-5: Sensitivity and Magnitude Criteria for Coastal Receptors

Receptor	Water levels, tidal currents and wave heights	Patterns of sediment transport, suspended sediment concentration and patterns of scour, erosion and accretion	Release of contaminants either dissolved or adsorbed to sediments	Deposition of contaminants adsorbed to sediments
Sensitivity	**Low** Naturally very variable. Weak linkages between receptor and secondary ecological or human receptors. Changes would need to be large for effects to be significant.	**Moderate** Naturally variable Changes in receptor would need to be substantial to influence secondary ecological receptors.	**High** Contaminated sediment releases are not routine. Close pathway of effect with other secondary ecological receptors.	
Magnitude	**Low** Changes are within background variability throughout study area. Short-term changes. **Medium** Potential for detectable but localised change in the study area. Likely to be short-term. **High** Detectable and widespread changes throughout study area. Likely to be long-term.			

Assessment of Significance

5.4.6 The significance criteria for the impacts on coastal processes will use the significance table that is provided in Table 5-5.

5.5 Preliminary Discussion of Mitigation and Enhancement Measures

Demolition and Construction Stage

5.5.1 There is the potential for effects during the demolition and construction stage of the proposed development via the risk of fine sediment release, some of which may be contaminated. To mitigate this effect the following measures will be considered;

- Through design, minimising the dredged volume by choice of areal extent and depth of dredged area;
- Choice of dredging method to minimise fine sediment resuspension e.g. backhoe;
- If suitable for wave or current conditions, use of silt screens or similar;
- Choice of timing of dredging to minimise effects on spawning or migrating fish;
- Identification of areas of contaminated sediment and removal by specialist plant;
- Treatment and disposal of contaminated material at specialist facilities on land.

5.5.2 If the material is suitable, the beneficial use of the dredged material arising will be considered, as an environmental enhancement.

Completed Development Stage

5.5.3 For the completed development stage of the proposed development the presence of the realigned quay and dredged areas has the potential to impact coastal processes. These impacts may be mitigated by addressing the main hydrodynamic drivers of change in the following ways throughout the design process:

- Minimising the areal extent and depth of dredged area;
- Considering the design of the revetment to minimise wave reflections;
- Minimising use of vertical structures; and
- Minimising areal extent of scour protection.

5.5.4 Beneficial use of any maintenance dredge arisings will be considered as an environmental enhancement.

6. MARINE WATER AND SEDIMENT QUALITY

6.1 Introduction

6.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to marine water quality and marine sediment quality.

6.1.2 The information within this section relates to the marine portion of the site only, so where 'the site' is used, it refers to the marine portion of the site. Likely effects relating to ground contamination within the terrestrial portion of the site are covered in Section 7: Ground Conditions and are only referred to in sections where there is a likely pathway between the terrestrial and marine environments.

6.1.3 The indirect effects of marine water quality on ecological, commercial fisheries and recreational receptors are covered in the respective sections.

6.2 Site Information and Baseline Conditions

Site Setting

6.2.1 The site lies along the northern side of the headland which terminates in Pendennis Point, at the point where the Penryn River and Carrick Roads channel meet within the Fal estuary. Water at the site is predominantly subject to tidal variation and sediment distribution and movement in this dynamic environment are controlled by multiple factors, including the competing currents within the estuary.

Water Quality – Water Framework Directive Surface Water

6.2.2 The surface water body in which the site lies is designated under the Water Framework Directive (WFD) as the Carrick Roads Outer water body. This is classified as a coastal water body, most recently (2019) being recorded as being of 'good' ecological quality, 'fail' chemical quality[12]. It is not classified as a heavily modified or artificial waterbody. The Environment Agency (EA) WFD classification records show that there are elevated concentrations of mercury compounds, tributyltin compounds and Polybrominated diphenyl ethers (PBDE) within this water body. The latter compounds are associated with widely used fire retardants and are potentially sourced from urban run-off into the estuary. Mercury and tributyltin are generally associated with industrial and commercial activities in the coastal urban environment, with tributyltin having been widely used as an additive in marine paints used on shipping. The waterbody is recorded as being well oxygenated and supporting good hydromorphological characteristics. The ecological quality elements that support the ecological element of the classification show good quality populations of invertebrates and phytoplankton levels that equate to high quality.

6.2.3 Downstream of the Carrick Roads Outer water body lies the Fal/Helford coastal waterbody, which currently has a classification of 'good' ecological quality, 'fail' chemical quality, with very similar characteristics as the Carrick Roads Outer water body. It also fails with respect to mercury compounds and PDBE.

12 DEFRA, 2022. Environment Agency: Catchment Data Explorer, Carrick Roads Outer Water Body, online. Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB650806250000 [Accessed 12/10/2022]

6.2.4 The Environment Agency monitor water quality within the site, at a sampling point approximately 100 m to the east of the northern wharf[13]. Results from 2020 to 2022 indicate a low turbidity environment, with high levels of dissolved oxygen, and tributyltin being present in most samples.

Water Quality – Water Framework Directive Groundwater

6.2.5 The site is underlain by the Portscatho Formation, which comprises interbedded sandstone and slaty mudstone and is classified as a Secondary A aquifer. This formation underlies the estuary, cropping out on land to both the north and south of the site (see Section 7: Ground Conditions for further details). Under the WFD, the aquifer within the Portscatho Formation is designated as being part of the South Cornwall Water Body and is classified as being of 'poor' overall quality and 'poor' chemical quality. The poor quality is noted as being predominantly due to agricultural issues (livestock, nutrient management and pesticide use) but also due to the effects of historical mining activities.

Water Quality – Bathing Water

6.2.6 The nearest designated bathing water to the site is at Gyllyngvase beach, located approximately 1 km to the southwest of the site, on the far side of Pendennis Point. Swanpool beach lies further along the same stretch of coast, approximately 2 km from the site, and also on the far side of Pendennis Point. Both beaches are classified as having excellent water quality[14], the water quality being classified in terms of *Intestinal Enterococci* and *Escherichia coli*.

Water Quality – Shellfish Water

6.2.7 The site straddles the boundary between two designated shellfish water protected areas (Penryn and Carrick Roads), each of which contains multiple individual shellfish beds for varieties of bivalve molluscs. Additionally, the Percuil shellfish water protected areas lies approximately 3.5 km to the east of the site on the far side of the Fal estuary. See Section 11: Commercial Finfisheries and Shellfisheries for further details.

6.2.8 The nearest shellfish bed lies approximately 3.2 km to the east of the site and has a classification of long term class B, meaning that water there is of a quality to support the growth of molluscs that require some form of pre-treatment prior to sale. To the east of this bed lies a further bed, which has a seasonal A/B classification, which indicates water quality good enough to support the growth of molluscs and where the quality varies on a seasonal basis.

Water Quality – Potential Disposal Site

6.2.9 The nearest operational marine sediment disposal site to the site is PL075, Falmouth Bay. This lies approximately 12 km to the southeast of the site, in the English Channel. The sea at that location is not classified under the WFD, due to its location beyond the extent to which WFD designation extends. No datasets are available to quantify water quality at the potential disposal site.

Sediment Quality

6.2.10 The site is located in an area of seabed consisting of a mix of rocky substrate/reefs, gravel and cobbles, as well as subtidal soft sediments of sand to clay grainsize[15] [16]. Section 9: Marine Ecology

13 DEFRA, 2022. Environment Agency, Water Quality Archive, Falmouth Docks Northern Wharf, online. Available at: https://environment.data.gov.uk/water-quality/view/sampling-point/SW-H1910125 [Accessed 12/10/2022]
14 DEFRA, 2022. Environment Agency, Bathing Water Quality, online. Available at: https://environment.data.gov.uk/bwq/profiles/ [Accessed 12/10/2022]
15 MAGiC, 2022. MAGiC Interactive Mapping, online. Available at: https://magic.defra.gov.uk/magicmap.aspx [Accessed 12/10/2022]
16 EMODnet, 2022. Seabed Habitats Map Viewer, online. Available at: https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/ [Accessed 12/10/2022]

outlines the results of a video survey conducted at the site in May 2022, which recorded seabed conditions at the site consisting predominantly of sublittoral cohesive mud and sandy mud with generally mixed (coarser) sediments occurring further from the existing port structures. Section 6: Coastal Processes and Sediment Regime discusses more details of the hydrodynamic regime within the harbour, and where associated types of sediment are found. The harbour generally supports a low suspended sediment regime.

6.2.11 The site has a long history of use as a working port and is also located within a geologically mineral-rich area, and as such any sediment located within the red line boundary is highly likely to be contaminated. An Environmental Impact Assessment (EIA) completed in 2009 for a previous scheme at the site[17] recorded within the associated Environmental Statement that samples of sediment were taken from within the boundary of the port and also in its vicinity. It also discusses previous investigations at and within the vicinity of the site, analysis of which confirmed the presence of elevated concentrations of a range of contaminants including tributyltin and dibutyltin, metals such as arsenic, nickel, copper, mercury, lead and zinc, as well as polyaromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

6.3 Potential Impacts and Likely Effects

6.3.1 The following sensitive receptors have been identified:

- The surface waters both within the site boundary and in the vicinity of it (the River Fal and wider Carrick Roads Outer water body).
- The Secondary A groundwater body underlying the site (the South Cornwall water body).
- Port operators or amenity site users (bathing water users) downstream or in the immediate vicinity of the site.
- Aquatic communities (particularly maerl beds and benthic communities) within or in the vicinity of the site, which are sensitive to smothering by sediments. The site lies within the Fal and Helford Special Area of Conservation, a key habitat within which is the maerl beds, which lie both within the boundary of the site and within the vicinity (see Section 10 for further details).
- Construction and demolition workers on-site.

6.3.2 Table 6-1 and Table 6-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to water quality and sediments, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 6-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Formation of pathways between contaminated sediments or surface waters and the underlying Secondary A aquifer.	Yes	The proposed development design is considered likely to incorporate piled structures, the construction of these may have the potential to create vertical pathways, allowing the migration of contamination between surface waters or contaminated sediments in continuity with surface waters into the underlying groundwater body.
Mobilisation of contaminated sediments during capital dredging	Yes	The proposed site works (including dredging) have the potential to disturb potentially contaminated sediment, potentially resulting in the exposure of construction

17 Royal Haskoning, 2009, Falmouth Cruise Project: Environmental Statement, 9S4181

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
and construction works (including demolition/removal of some of the existing marine structures) potentially causing adverse effects on human and ecological receptors in the vicinity, but also removing source of contamination from the site.		workers, port operatives who work on the water and aquatic ecosystems (particularly maerl beds) and shellfish beds to contaminated sediments (also see Section 6: Coastal Processes and Sediment Regime and Section 11: Commercial Finfisheries and Shellfisheries).
	No	Potential impacts on users of designated bathing waters are scoped out due to the presence of Pendennis Point, which will direct currents (and thus sediment) away from the beaches.
Mobilisation of contaminated sediments during capital dredging and construction works (including demolition/removal of some of the existing marine structures) potentially causing adverse effects to the water quality in the River Fal in the vicinity of the site	Yes	The proposed site works (including dredging) have the potential to disturb potentially contaminated sediment, which may be capable of adversely affecting the chemical quality or turbidity of the River Fal and the wider Carrick Roads Outer water body (also see Section 6: Coastal Processes and Sediment Regime).
Exposure of demolition and construction workers to contaminated groundwater	No	Standard demolition and construction practices would mitigate significant risks of exposure, such as using appropriate PPE.
Release, dispersion and fate of material placed at disposal site (at sea).	Yes	Sediments at the site are likely to be contaminated and thus present a potential risk to the environment and habitats at and in the vicinity of the marine disposal site that is chosen. The volume dredged and level of contamination present will determine the level of risk and thus the mitigation measures that need to be put in place. For example, control on the volumes and types of material to be disposed of at sea based on the levels of contamination present and disposal licence requirements. Beneficial reuse will be considered where practicable (also see Section 6: Coastal Processes and Sediment Regime and Section 20: Material Resources and Waste).
Pollution of water environment through accidental spillage or leakages during construction works.	No	Site operations and environmental protection will be managed through the implementation of a Construction Environmental Management Plan (CEMP).

Table 6-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Mobilisation of materials and pollutants during rainfall events resulting	No	The appropriate management of surface water runoff is required (e.g. inclusion of oil/water interceptors) to prevent materials or pollutants washing from the site

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
in pollution being released into the River Fal		during rainfall events and entering the harbour waters. Scheme design will ensure controls at the same level as the existing port operations as a minimum.
Release of contaminants from site during operations (for example through spillages or leakages) to surrounding waters.	No	Operations on site involve the handling of potentially hazardous materials as cargo and fuelling and mooring of large ships. Appropriate port management procedures regarding incoming shipping and spill response will be in place to manage these risks. These will be a continuation of management procedures currently in place at Falmouth Harbour.
Discharges to water environment from operational activities such as removal of wastewater from shipping/ boats using the site.	No	The port operates under regulatory requirements in terms of discharge of waste, has an environmental code of conduct[18] and vessels entering the port are required to comply with the requirements of the IMO Ballast water management convention. These systems and requirements will be in place during the operation of the proposed scheme.
Increased suspended sediment concentration in water column during maintenance dredging, and subsequent deposition on nearby habitats.	Yes	Environmental receptors, notably maerl habitats, are sensitive to increased turbidity. Scoped in subject to the identification of the need for maintenance dredging for the deepened berths (also see Section 6: Coastal Processes and Sediment Regime).
Increase in nutrient discharges into River Fal from treated sewage	No	The site is not located in a catchment identified by Natural England as contributing to the deterioration or poor quality of a European designated site, through inputs of nutrients.

6.4 Approach and Methodology

6.4.1 A water and sediment environment ES chapter will be prepared, detailing the baseline water and sediment environment at the site (focussed on sediment quality in the area of the site, WFD criteria and classifications). This will be supported by hydrodynamic modelling and marine ecological surveys as outlined in Section 6: Coastal Processes and Sediment Regime and Section 10: Marine Ecology respectively, as well as sediment sampling within the site to support a marine licence application for the required dredging.

6.4.2 The impact assessment documented within the ES chapter will use a source-pathway receptor approach to identify the likely significance of effects and develop criteria for site management and monitoring.

6.4.3 Where appropriate, technical appendices will be prepared to support the ES chapter. These will include, as a minimum, a WFD assessment to support the marine licence application and inform the ES, as well as results of any ground investigations and sediment sampling carried out at the site. A sampling plan to support the marine licence application for the required dredging will be prepared and submitted to the Marine Management Organisation (MMO) prior to commencement of any investigation works on site.

[18] Cornwall Councill, 2021. Environmental Code of Practice for the Ports of Falmouth, Truro, Penryn and St Mawes, online. Available at: https://www.falmouthharbour.co.uk/wp-content/uploads/2021/12/Environmental-Code-A5.pdf [Accessed 12/10/2022]

6.4.4 Assessment of the scale of the potential risks to surface and groundwater bodies will utilise the standards laid out in the WFD and supporting legislation, including The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 and The Groundwater (England and Wales) Regulations 2009.

6.4.5 Potential impacts associated with sediments will be informed by Cefas (Centre for Environment, Fisheries, and Aquaculture Science) Action levels and associated guidance, as well as UK marine licensing guidance.

6.5 Preliminary Discussion of Mitigation and Enhancement Measures

6.5.1 The ES will identify any necessary mitigation measures, dependant on the outcome of the water quality and sediment assessment. Measures will be developed in co-ordination with the findings and recommendations with Section 6: Coastal Processes and Sediment Regime and Section 10: Marine Ecology and could include:

i. Development of suitable foundations (to mitigate the risk of creation of vertical pathways), informed by a foundation works risk assessment;
ii. Dredge method controls such as silt curtains, in order to minimise the mobilisation and dispersion of sediments;
iii. Construction method recommendations; and
iv. Appropriate water and sediment related measures to be included in and implemented through a CEMP.

7. GROUND CONDITIONS

7.1 Introduction

7.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to ground conditions in the terrestrial portion of the site. The information within this section relates to the terrestrial portion of the site only, so where 'the site' is used, it refers to the terrestrial portion of the site.

7.2 Site Information and Baseline Conditions

Historical Background

7.2.1 The Falmouth Docks were constructed from 1860 onwards and have undergone multiple phases of development and redevelopment over the course of their history. The site comprises the northernmost area of the docks and has historically been used for cargo handling, ship-repair, an iron foundry and short-term storage while warehouses and other commercial and industrial buildings, including a timber yard, have historically been present within the wider dock area. This long history of industrial use indicates that there is a high likelihood of contamination at the site.

Geology and Hydrogeology

7.2.2 British Geological Survey map sheet 352 (Falmouth, solid and drift geology) records ground conditions beneath the site. Made Ground (i.e., reclaimed land) underlies the site to the west of a line running diagonally from the southern end of the western wharf to near Falmouth lifeboat station. To the east of that line the site is underlain by bedrock of the Portscatho Formation, recorded by the BGS to comprise interbedded sandstone and slaty mudstone. No superficial deposits are recorded on-site. The BGS Onshore Geoindex[19] lists one borehole in the vicinity of the site, located to the south east of the lifeboat station (borehole reference SW83SW5). The log for this borehole records the presence of approximately 3 m of Made Ground, consisting of mainly of sand and gravels derived of granitic and slate materials. The logs from two boreholes completed in the central portion of the western wharf in May 2022[20] record Made Ground of mostly sand, with some gravel size material, to a depth of 6.7 m, over a sequence of clays, mudstones and gravels to at least 22 m below the level of the wharf.

7.2.3 The bedrock aquifer underlying the site is classified as a Secondary A aquifer by the Environment Agency, with a Secondary A aquifer being defined as a permeable formation with the potential to support localised abstractions. The site lies outside of any identified groundwater Source Protection Zones (SPZs) and given its proximity to the sea is unlikely to support any local potable abstractions. Under the WFD, the aquifer within the Portscatho Formation is designated as being part of the South Cornwall Water Body and is classified as being of 'poor' overall quality and 'poor' chemical quality. The poor quality is noted as being predominantly due to agricultural issues

19 British Geological Survey Onshore GeoIndex, online interactive map. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.76048533.1647733872.1633466935-1794924348.1632233955 [Accessed 12/10/2022]
20 Geotechnical Engineering Ltd, May 2022, Falmouth Causeway Factual Ground Investigation Report (report 36988)

(livestock, nutrient management and pesticide use) but also due to the effects of historical mining activities.

7.3 Potential Impacts and Likely Effects

7.3.1 The following sensitive receptors have been identified:

- Construction and demolition workers on-site;
- Off-site commercial site users;
- Proposed site structures; and
- Surrounding controlled waters.

7.3.2 Table 7-1 and Table 7-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to ground conditions, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision. Details of the proposed development are provided in Section 3: Proposed Development.

7.3.3 The majority of the works are focussed upon elements within the marine portion of the site, not the terrestrial portion. The County and Duchy Wharves lie within the terrestrial portion of the site. The wall adjacent to the Duchy wharf is noted as overturning and experiencing rotational failure and cracking, these structural issues will either be addressed through the construction of the FLOW deck or if this option is not progressed, the structural failures will be repaired. Terrestrial works are therefore, at this stage, assumed to be very limited, and likely to be restricted to works required to facilitate repair and upgrading of these wharf areas.

Table 7-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Exposure of demolition and construction workers to contaminated soils	No	Proposed terrestrial activities involve limited interaction with the ground. Standard demolition and construction practices would mitigate significant risks of exposure, such as using appropriate Personal Protective Equipment (PPE).
Exposure of neighbouring site users to dusts arising from the Made Ground	No	Proposed terrestrial activities involve limited interaction with the ground. Standard demolition and construction practices would mitigate significant risks of exposure. Dust suppression may be required, however this would be expected as part of best practice construction on site. Proximate sites are also commercial or industrial properties rather than residential and therefore considered to be of reduced sensitivity.
Mobilisation of site materials and pollutants during rainfall events resulting in pollution being released into the River Fal	No	The appropriate management of surface water runoff is required to prevent materials or pollutants washing from the site during rainfall events and entering the harbour waters. Good construction practices managed through the implementation of a CEMP. will be sufficient to ensure that materials are stored securely and construction run-off is managed correctly.

Table 7-2: Potential Completed Development Effects

Potential Effect	To be assessed in the EIA (Yes/No)	Reason
None identified.		

7.4 Approach and Methodology

7.4.1 The potential effects outlined above have been assessed using the source-pathway receptor methodology, in the context of the limited nature of terrestrial works. No potentially significant effects have been identified and as such ground conditions are scoped out of further assessment and will not be taken forward into the EIA.

7.5 Preliminary Discussion of Mitigation and Enhancement Measures

7.5.1 As no potentially significant completed development effects have been identified in relation to ground conditions, no mitigation or enhancement measures are deemed to be necessary in this instance. Standard construction protocols are considered to be adequate to manage any low-level risks at the site and ensure that there is no risk to identified receptors.

8. FLOOD RISK

8.1 Introduction

8.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to flood risk.

8.2 Site Information and Baseline Conditions

Hydrological Features

8.2.1 Falmouth Docks lie at the mouth of Penryn River, with the Inner Harbour located to the west, and Carrick Roads (estuary of the River Fal) located to the east. On the far side of the peninsula, to the south of the site, lies Falmouth Bay. As stated in Section 5: Coastal Processes and Sediment Regime, the tide in Falmouth Harbour is semi-diurnal with two high waters and low waters each day. The standard water levels are listed in Table 5-1. Tide levels range from 5.7 m CD at Highest Astronomical tide to -0.2 m CD at Lowest Astronomical tide. The mean spring tide range is 2.6 m CD which puts the harbour into the macrotidal classification. Ordnance Datum (OD) levels range from 2.8 m OD at Highest Astronomical tide to -3.1 m OD at Lowest Astronomical tide.

Topography

8.2.2 Of the areas that lie above Mean High Water Springs (MHWS), most of the dock site lies between approximately 5.0 and 6.0 m AOD (Above Ordnance Datum)[21]. Queen's Wharf sits at approximately 5.5 m AOD. The Northern Wharf sits largely between 5.3 and 5.8 m AOD, with the western third sitting lower at between approximately 4.5 and 5.3 m AOD. The Western Wharf ranges from approximately 4.6 m AOD at its northern end, before gradually rising to approximately 5.4 m AOD at its southern end.

8.2.3 According to EA LiDAR data[22], the Eastern Breakwater, which is identified in Figure 2-2, typically sits between approximately 5.0 and 5.4 m AOD, with the terrain steadily increasing towards its southern end. The eastern part of the docks, between the Eastern Breakwater and the Queen Elizabeth Dock, lies for the most part between approximately 5.4 and 5.8 m AOD, with levels increasing up to approximately 7.0 m AOD at the southern end of the docks. From Queen Elizabeth Dock to County Wharf in the west, terrain is typically between 5.1 and 5.5 m AOD[21], with a lower area to the south of Duchy Wharf sitting at between approximately 4.8 and 5.1 m AOD.

Flood Zone Status

8.2.4 The landward aspects of the docks are shown to be largely located in Flood Zone 1[23]. An area of Flood Zone 3 runs adjacent to the MHWS between No. 1 Dock and the Eastern Breakwater. Furthermore, an area of Flood Zone 2 and 3 runs adjacent to the MHWS just south of County Wharf. It is anticipated that flood risks to the site would primarily be associated with water levels in the adjacent estuary. On this basis, the mapping does not necessarily reflect the situation as accurately as a comparison between peak flood levels and elevations of key infrastructure on-site as described above. Nevertheless, there appears to be a clear route to/from the majority of the

21 RPS Design, 2007. Falmouth Docks, Topographical Survey
22 Department for Environment Food & Rural Affairs, 2022. Data Services Platform, online. Available at: https://environment.data.gov.uk/dataset/668881ad-4f8f-42bd-b835-89acf0269496. [Accessed 22/09/2022]
23 GOV.UK, 2022. Flood map for planning, online. Available at: https://flood-map-for-planning.service.gov.uk [Accessed 22/09/2022]

site (e.g., to/from Falmouth Docks railway station) through the landward side of the site entirely within Flood Zone 1. Refer to Figure 8-1 for the Flood Zone Map.

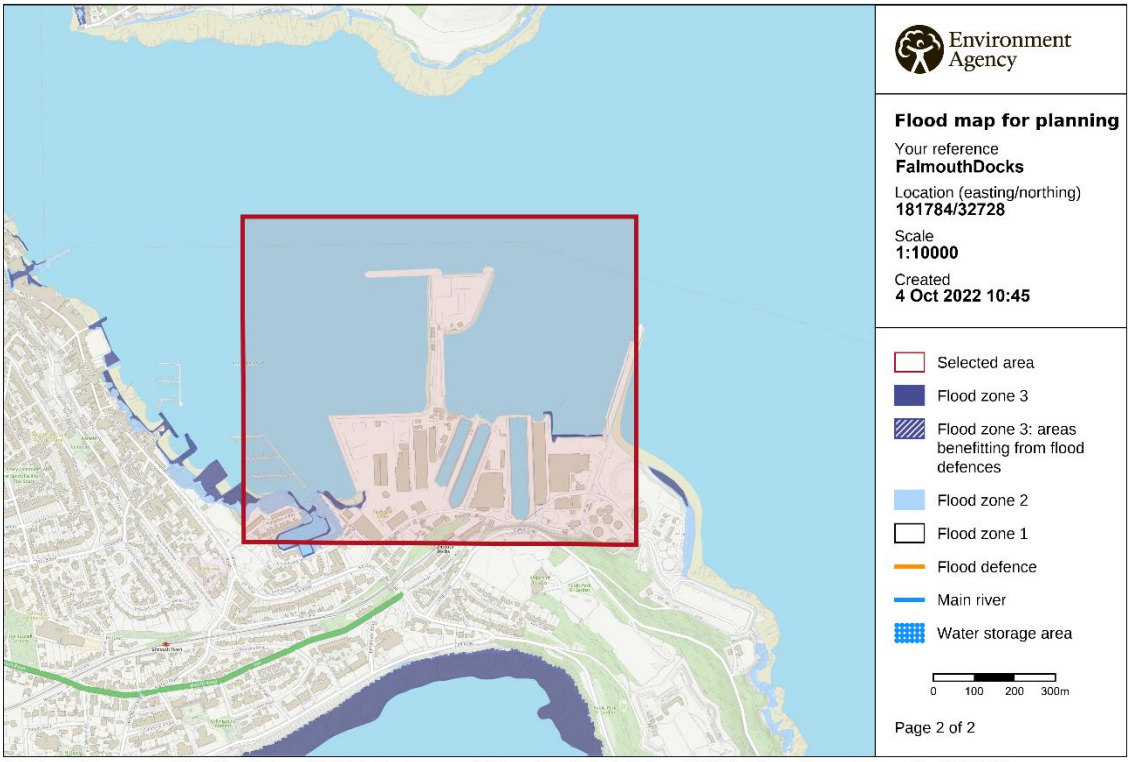


Figure 8-1: Flood Zone Map, Environmental Agency 2022

8.2.5 Enquiries were made with the EA to determine the availability of flooding information relating to the site and the surrounding area, including modelled flood levels. Data, including modelled flood levels, was received on 16 August 2022. This will be used to inform the FRA.

Surface Water Flood Risk

8.2.6 The landward aspects of the docks are shown to be largely located in areas at a Very Low risk of flooding from surface water[24], see Figure 8-2. Small areas of High pluvial (surface water) risk are present at the southern end of No.1 Dock, south of the Eastern Breakwater, and in the area between County Wharf and Duchy Wharf. Areas of Medium and Low pluvial risk are present adjacent to the stated areas of High risk, in isolated areas within the remaining docks and in further isolated areas around the buildings in the area between County Wharf and Duchy Wharf. It should be noted that the EA mapping does not take detailed account of existing surface water drainage assets and that the actual risk may be lower than that shown by the mapping; there is no anecdotal evidence of surface water flooding.

24 GOV.UK, 2022. Check your long term flood risk, online. Available at: https://check-long-term-flood-risk.service.gov.uk [Accessed 22/09/2022]

Figure 8-2: Surface Water Flood Risk, Ordnance Survey, 2022

Historic Flooding

8.2.7 The EA's published geo-spatial records of historical flooding indicate that there have been no on-site incidents of flooding observed by or reported to the EA[25]. The nearest recorded incident of flooding was located approximately 370 m south of the site and was designated as a coastal flood that took place in March 2018, caused by overtopping of defences. The flood was located to the south of Cliff Road and does not appear to have affected a large area (approximately 0.05 ha at this location).

Defences

8.2.8 No formal flood defences are recorded on site within the EA records.

Future Scenario

8.2.9 During the present-day scenario, the following areas are shown to be at a medium risk from tidal extremes:

- Queen's Wharf;
- The Northern Arm;
- The eastern part of the Northern Wharf;
- Most of the Western Wharf except for the western edge; and
- Isolated areas to the south of Duchy Wharf.

25 Department for Environment Food & Rural Affairs, 2022. Data Services Platform, online. Available at: https://environment.data.gov.uk/dataset/8c75e700-d465-11e4-8b5b-f0def148f590 [Accessed 15/08/2022]

8.2.10 The Cornwall Council Strategic Flood Risk Assessment (SFRA)[26] presents data on tidal extremes including a projection for sea level rise. This is presented as areas at a medium risk today (extent of the 1 in 200 year still water extreme tide event at present day), areas at a medium risk in 50 years (extent of the 1 in 200 year still water extreme tide event in 50 years' time), and areas at a medium risk in 100 years (extent of the 1 in 200 year still water extreme tide event in 100 years' time). Extracts from the SFRA visualising the different tidal extremes are available to view in Figure 8-3.

26 Cornwall Council, 2022. Strategic Flood Risk Assessment, online. Available at: https://map.cornwall.gov.uk/website/ccmap/index.html?zoomlevel=8&xcoord=181780&ycoord=32672&wsName=sfra&layerName=Medium%20risk%20present%20day [Accessed 15/08/2022]

Figure 8-3: Tidal Flood Risk at the site from the 1 in 200 year tide event at present (left), in 50 years (middle) and in 100 years (right), Cornwall SFRA, 2022

8.2.11 In 50 years, areas at risk are projected to expand slightly further within similar areas. In 100 years, only an isolated area of the Northern Wharf and the south-east part of the docks are projected to be free from a medium risk of tidal extremes. It should be noted this modelling has been undertaken in the absence of the proposed works.

8.3 Potential Impacts and Likely Effects

8.3.1 The following sensitive receptors have been identified:

- The flood risk status of the site, taking account of the likelihood of flooding and the potential consequences to site infrastructure and occupants; and
- The flood risk status of off-site areas and the hydrological regime of the water environment. This will also be addressed in Section 5: Coastal Processes and Sediment Regime, including updated modelling of the site from a hydrological and sediment regime perspective.

8.3.2 Table 8-1 and Table 8-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to flood risk, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 8-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Working within an area of Flood Zone.	No	To be assessed within the FRA in accordance with the NPPF. No significant effects directly related to flooding are anticipated.

Table 8-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Changes to water levels (tidal and surges) during operational life of scheme.	No	Changes to the cross-sectional area of the harbour associated with the proposed development are too small to alter the propagation of tides or meteorological surges.
Changes to wave conditions during operational life of scheme.	Yes	Changes to the form of the quay line may alter the wave reflection properties. Dredging a new berth pocket may result in changes to refraction of waves. These effects have potential implications for flood risk and would be assessed in the Coastal Processes and Sediment Regime chapter and the FRA.
Long term changes to the surface water runoff regime from the site.	No	To be assessed within the FRA in accordance with the NPPF.

8.4 Approach and Methodology

8.4.1 The changes to tidal currents will be addressed as part of the Coastal Processes and Sediment Regime ES Chapter. As there is a requirement for an FRA, this will be completed as a standalone document accompanying the ES.

8.4.2 The NPPF[27] requires that an FRA should be submitted with planning applications for all sites within Flood Zones 2 or 3 or sites of 1 hectare or more to determine the risks of flooding at the development site (from all sources including rivers, the sea, sewers, and groundwater). An FRA is therefore an essential element in the overall acceptability of the proposed development in planning terms.

8.4.3 Therefore, an FRA will be produced in accordance with the NPPF[27] and PPG: Flood Risk and Coastal Change[28] and will assess sources of potential flooding including tidal, fluvial, pluvial (surface water), groundwater and artificial sources. In particular, the FRA would assess whether the proposed works are likely to be affected by current or future flooding and will consider the potential for flood risks to arise as a result of the introduction of the proposed works, either on or off-site. The FRA would set out measures to mitigate against any flood risks.

8.4.4 It is proposed that Flood Risk be scoped out of the EIA as an ES Chapter on the basis that a standalone FRA will be undertaken. Issues arising as a result of changes to the hydrodynamic conditions of tidal waters at the site due to the proposed works would be assessed in Section 5: Coastal Processes and Sediment Regime.

8.5 Preliminary Discussion of Mitigation and Enhancement Measures

8.5.1 For the completed phase of the proposed development the presence of the realigned quay and dredged areas has the potential to impact coastal processes and therefore flood risk. These impacts may be mitigated by addressing the main hydrodynamic drivers of change in the following ways throughout the design process:

- Minimising the areal extent and depth of dredged area;
- Considering the design of the revetment to minimise wave reflections;
- Minimising use of vertical structures; and
- Minimising areal extent of scour protection (if required).

8.5.2 As part of the FRA, it is anticipated that mitigation measures to prevent any significant adverse effects, where necessary, could include:

- Provision of safe access/egress to/from the site at both construction and operational stages, for both staff working at the site and visitors; and
- Development of a flood resilient or resistant design.

[27] UK Government, 2021. National Planning Policy Framework, online. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed 16/08/2022]
[28] GOV.UK, 2022. Flood risk and coastal change, online. Available at: https://www.gov.uk/guidance/flood-risk-and-coastal-change [Accessed 16/08/2022]

9. MARINE ECOLOGY

9.1 Introduction

9.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to the following marine ecological receptors (including protected habitats, species and designated sites for each of the below):

- Benthic ecological communities (including Invasive and Non-Native Species (INNS);
- Marine mammals; and
- Fish and shellfish ecological communities.

9.2 Site Information and Baseline Conditions

Designated Sites for Nature Conservation

9.2.1 The Fal estuary and complex is located in southwest England, and the Port of Falmouth is located at the mouth of the River Penryn on the western side of the estuary complex. The estuary at this point is predominantly subtidal, and although extensive intertidal areas exist farther up the estuary complex, the marine environment under consideration here is entirely subtidal. The Fal and Helford Special Area of Conservation (SAC) was designated in 2004[29], primarily due to the presence of Maerl Beds of *Phymatolithon calcareum* and *Lithothamnion corallioides*. The Fal complex contains the largest known maerl beds in south-west Britain. Maerl beds, both live and dead, provide significant 3-dimensional habitat complexity that supports a high diversity of marine flora and fauna[30].

9.2.2 Adjacent to the site, but within wider Fal estuary is the Falmouth Bay to St Austell Bay Special Protection Area (SPA), which has been designated since 2017 due to the presence of black-throated diver, great northern diver and Slavonian grebe[31]. Potential impacts on ornithological features are discussed in Section 11: Terrestrial Ecology and Ornithology

9.2.3 The Lower Fal and Helford Intertidal SSSI is not located within the site, but is situated within 2 km. This SSSI has been designated since 1997 for the variety of intertidal habitats and associated communities found within it. All components of this SSSI are currently in 'Favourable Condition'[32].

9.2.4 The waters of the Fal Estuary are designated as a Shellfish Water under the EC Shellfish Waters Directive (2006/113/EEC). There are numerous active shellfish Classification Zones within the upper and lower Fal estuary, although potential impacts to these are discussed in Section 10: Commercial Finfisheries and Shellfisheries.

9.2.5 No other statutory or non-statutory designated sites within 2 km of the site have been identified.

[29] JNCC, 2004. Fal and Helford - Special Areas of Conservation. *Special Areas of Conservation: Sites* https://sac.jncc.gov.uk/site/UK0013112

[30] Hall-Spencer, J. M., Kelly, J. & Maggs, C. A., 2010. *Background Document for Maerl Beds*

[31] Natural England, 2022. Falmouth Bay to St Austell Bay SPA. *Natural England Conservation Advice for Marine Protected Areas* https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9020323&SiteName=falmouth&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&HasCA=1&NumMarineSeasonality=3&SiteNameDisplay=Falmouth%20Bay%20to%20St%20Austell%20Bay%20SPA

[32] Natural England, 2022. Lower Fal and Helford Intertidal SSSI. *Designated Sites View* https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s2000174

Benthic Ecological Communities

9.2.6 An indicative Drop-Down Video (DDV) survey of the port structures and surrounding areas was conducted in May 2022 to give an outline characterisation of the benthic environment within the survey area in terms of the seabed habitats and associated biological epibenthic communities and to enable the design of more detailed surveys which are to inform the EIA. No infauna sampling was undertaken during this survey.

9.2.7 This survey indicated that the substrate nearest to the port structures were characterised by predominantly SS.SMu – Sublittoral cohesive mud and sandy mud communities[33] and SS.SMx.IMx – Infralittoral mixed sediment[34], with generally mixed (more coarse) sediments occurring further from the port structures. Transects in the approach channel were generally characterised as SS.SCs.ICs – Infralittoral coarse sediment[35]. A single transect, located in the main approach channel, was characterised as SS.SMp.Mrl – Maerl Beds[36] along its entire length (Figure 9-1). Dead maerl was recorded on 11 of the 24 transects and live maerl on 6 of the 24 transects. The survey report is provided in Appendix 4B.

9.2.8 Further information about the study area will be gained through a multidisciplinary ecological survey that is anticipated to be conducted in November 2022. This is within the appropriate survey season for the habitats being studied. The scope of the survey has been agreed through consultation with Natural England, the MMO and Cefas (document reference J0654/06/23), the survey will comprise the following:

- Subtidal benthic ecological survey: Use of a Day grab to collect infauna samples at a series of sites throughout the study area. The contents of each grab will be studied to provide information about the infauna community composition and Particle Size Distribution (PSD)
- Drop down video survey: Use of a high-performance drop-down camera system to enable characterisation of the benthic ecology inhabiting the subtidal rock located to the north of the approach channel.
- Port inspection: Use of a small Remotely Operated Vehicle (ROV) system to undertake an inspection of the below-water structures of the Port of Falmouth.

9.2.9 In addition to the field studies above, baseline information about the site will be derived through a thorough review of available literature, including (but not limited to) that provided by Natural England during consultations:

- A 2014 report on dive and drop-down video surveys of the Fal and Helford SAC in 2013[37]

33 JNCC, 2022. Sublittoral cohesive mud and sandy mud communities - JNCC Marine Habitat Classification. *The Marine Habitat Classification for Britain and Ireland Version 22.04* https://mhc.jncc.gov.uk/biotopes/jnccmncr00002037
34 JNCC, 2022. Infralittoral mixed sediment - JNCC Marine Habitat Classification. *The Marine Habitat Classification for Britain and Ireland Version 22.04* https://mhc.jncc.gov.uk/biotopes/jnccmncr00001565
35 JNCC, 2022. Infralittoral coarse sediment - JNCC Marine Habitat Classification. *The Marine Habitat Classification for Britain and Ireland Version 22.04* https://mhc.jncc.gov.uk/biotopes/jnccmncr00002035
36 JNCC, 2022. Maerl beds - JNCC Marine Habitat Classification. *The Marine Habitat Classification for Britain and Ireland Version 22.04* https://mhc.jncc.gov.uk/biotopes/jnccmncr00001554
37 Allen, C., Axelsson, M., Dewey, S. & Wislon, J., 2014. *Fal and Helford SAC maerl drop-down video and dive survey 2013*

Marine Mammal Communities

9.2.10 The field studies described above will primarily provide information about the benthic ecological community of the site. No specific marine mammal surveys are currently planned to be undertaken, due to the highly mobile nature of this group and as it is considered that data of sufficient spatial/temporal scale and resolution is available. No marine mammals were spotted during the May 2022 DDV survey, however.

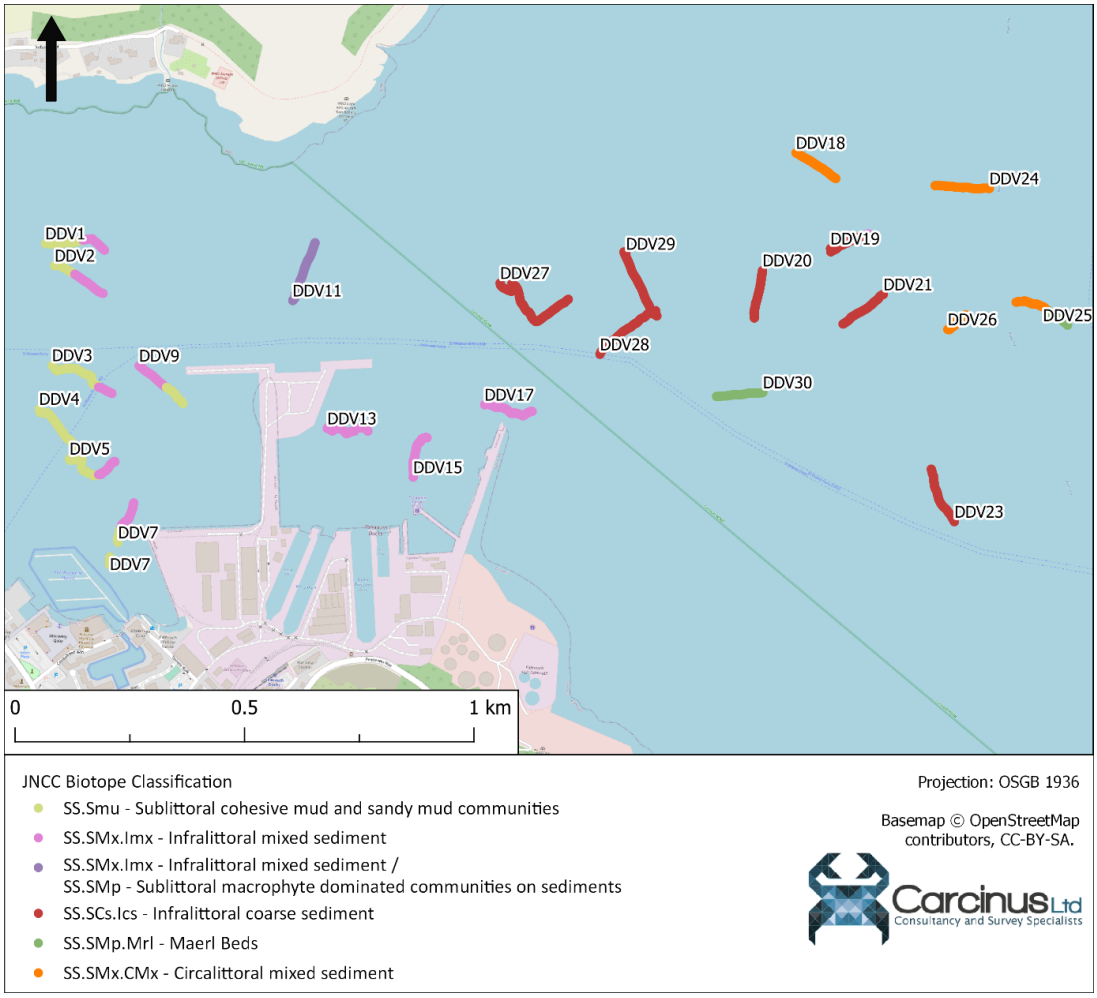


Figure 9-1: Indicative biotopes assigned to DDV transects surveyed during the May 2022 DDV survey

9.2.11 The Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS)'s public data dashboard has over 480 records of 13 different marine mammal species being recorded in the vicinity of the Fal estuary complex[38] since 2017. Sighted species include both species of seal found in the UK as well as various dolphin and whale species. A full breakdown of the marine mammal species recorded in the vicinity of the site, as well as the wider English Channel and northeast Atlantic, will be provided in the ES chapter.

Fish and Shellfish Communities

9.2.12 The field studies described above will primarily provide information about the benthic ecological community of the site (although some incidental information about fish communities may be collected during the drop-down video survey). No specific fisheries surveys are currently planned

38 ERCCIS, 2022. Public data dashboard. *Public Data Dashboard* http://*erccis*.org.uk/explore/public/dashboard

to be undertaken, as it is considered that data of sufficient spatial/temporal scale and resolution is available.

9.2.13 The southwest coast of England, and the Fal estuary complex itself contain a variety of subtidal habitats that support a significant diversity and abundance of commercial finfish and shellfish species. Cornwall Inshore Fisheries and Conservation Authority (C-IFCA) note that there is an active wrasse fishery in the area, as well as fisheries for bass and sea trout. There are also active shellfisheries for native oyster (*Ostrea edulis*), Pacific oyster (*Crassostrea gigas*), mussels (*Mytilus* spp.) and two scallop species (*Aequipecten opercularis* and *Mimachlamys varia*). More information about the commercial shellfish and finish species is provided in Section 11 of this scoping report.

9.2.14 The Environment Agency conduct biannual monitoring of fish populations in Transitional and Coastal (TraC) waters, and results from these surveys indicate a significant diversity of fish species have been recorded within the waters of the Fal, including various goby species, mullet, smelt, wrasse and many others. A full breakdown of the recorded species is beyond the scope of this scoping section but will be presented in the full ES chapter.

Further Information

9.2.15 A desk study for the Marine Ecology ES chapter is proposed to be a 2 km radius from the site boundary, with designated sites beyond this boundary considered where there is potential for impacts. This desk study will be undertaken using new data from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) and additional sources where available.

9.3 Potential Impacts and Likely Effects

9.3.1 The following sensitive receptors have been identified:

- Intertidal and subtidal marine benthic habitats and associated epi- and infauna;
- Marine and estuarine fish species, including migratory species; and
- Marine mammals, including cetaceans and pinnipeds.

9.3.2 Table 9-1 and Table 9-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to marine ecological receptors, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 9-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Propeller wash and wake wash resulting in disturbance to benthic habitats	Yes	Elements of construction will require additional boat movements into and out of the port.
Shading and overshadowing	Yes	Additional port structures will cause additional areas of subtidal environment to be periodically under additional shadow.
Noise and disturbance from vessel movement, piling and dredging	Yes	Risk of adverse impacts to all receptors. Anthropogenic disturbance from additional Noise and Vibration widely accepted to be a potential impact to numerous marine species, with

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		impacts ranging from temporary displacement to permanent injury.
Permanent and temporary loss and disturbance to habitats within the vicinity of piling resulting from scour or subsequent sediment mobilisation.	Yes	Risk of adverse impacts – particularly to maerl habitats which are sensitive to smothering[3911].
Increased suspended sediment concentrations, sediment mobilisation and potential for smothering, caused by dredging operations	Yes	Risk of adverse impacts – particularly to maerl habitats which are sensitive to smothering[11].

Table 9-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Potential spills and release of contaminants during vessel movement into and out of the port	No	Operations on site involve the handling of potentially hazardous materials as cargo and fuelling and mooring of large ships. Appropriate port management procedures regarding incoming shipping and spill response will be in place to manage these risks. These will be a continuation of management procedures currently in place at Falmouth Harbour.
Vessel strike causing injury to marine mammals	Yes	Risk of adverse impacts to increased vessel activity in the area as development is in part designed to promote additional usage/throughput of the port.
Propeller wash and wake wash resulting in disturbance to benthic habitats	No	Elements of operational scheme will require additional / different boat movements into and out of the port. This is unlikely to be significant, but the effects will be considered in the ES.

9.4 Approach and Methodology

Consultation

9.4.1 As described above, marine ecological surveys in the subtidal environment will/ are being undertaken with the correct permissions and notifications arranged with the MMO and NE. A number of consultations with Natural England have been undertaken to date under the Discretionary Advice Service (DAS) Reference: A005429, and the outcomes of this consultation have supported this scoping.

Impact Assessment

39 Jackson, P., F. & Garrard, S. L., 2017. Phymatolithon calcareum Maerl. in *Marine Life Information Network: Biology and Sensitivity Key Information Reviews* (Marine Biological Association of the United Kingdom)

9.4.2 An ecological impact assessment of the proposed development will be undertaken and will rely on survey information obtained from the surveys as described in Section 9.2 and detailed in subsequent reports. This assessment will be conducted with consideration to any/ all embedded mitigation.

9.4.3 Effects on habitats and species within the site, in adjacent areas of water and on nearby designated sites will be assessed. An assessment of the potential effects of the proposed development (including overshadowing) will be undertaken in line with CIEEM guidance[40] where relevant and will rely on the site-specific survey information and desk-based information.

9.4.4 Additional information such as construction drawings/ information and construction methodologies and operational procedures will be used to inform the assessment. Where additional mitigation will be required to reduce the level of significance of effects, this will be detailed. Potential mitigation could include phasing certain aspects of construction to avoid sensitive times of year, using particular construction methodologies etc.

9.4.5 The results of this assessment will be presented within a Marine Ecology chapter in the ES.

9.5 Preliminary Discussion of Mitigation and Enhancement Measures

9.5.1 Potential mitigation measures that could be employed during the demolition/construction stage include (but are not necessarily limited to):

- Use of a 'soft-start' procedure for any/ all piling operations;
- Avoidance of important migratory fish periods through seasonal piling;
- Use of silt curtains during any/ all dredging operations to minimise smothering; and
- Use of vibro-piling.

9.5.2 Marine enhancement to support efforts towards marine biodiversity net gain will be explored within the design of the proposed development.

40 CIEEM, 2019. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*

10. COMMERCIAL FINFISHERIES AND SHELLFISHERIES

10.1 Introduction

10.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to commercial finfish and shellfish species, and their fisheries.

10.2 Site Information and Baseline Conditions

10.2.1 The south west coast of England, and the Fal estuary complex itself contain a variety of subtidal habitats that support a significant diversity and abundance of commercial finfish and shellfish species. A brief summary of the species known to be present in and around the site is presented below.

10.2.2 No specific fisheries surveys are planned to be undertaken as there is considered to be data of sufficient spatial and temporal scale and resolution to reliably inform the assessment. This data is anticipated to come from (but is not limited to) the following data sources:

- Marine Life Information Network (MarLIN)
- Cornwall Inshore Fisheries and Conservation Authority (C-IFCA)
- Marine Management Organisation (MMO) UK fleet landings
- Consultation with relevant local stakeholders (such as FalFish, a wholesaler operating from the Port of Falmouth).
- Published literature (Ellis *et al.*[41] and Coull *et al.*[42])

Commercial Fisheries

10.2.3 Cornwall Inshore Fisheries and Conservation Authority (IFCA) note that a significant wrasse fishery has developed over the last several years[43], as well as fisheries for bass and sea trout.

10.2.4 Ellis et al. compiled updated maps of the spawning and nursery grounds of selected fish species around the British Isles. Table 10-1 presents a summary of this data, indicating that the site is located within the spawning area for nine commercially important species, and within the nursery area for five commercially important species.

Table 10-1: Fish species for which the site is located within the estimated spawning/ nursery area. Based on Ellis *et al.*

Species	Spawning Season	Site within Spawning Area	Site within Nursery Area
Spurdog *Squalus acanthias*	Year round	No	**Yes (low intensity)**
Tope shark *Galeorhinus galeus*	N/A	No	No

41 Ellis, J., Milligan, S. P., Readdy, L., Taylor, N. & Brown, M. J., 2012. *Spawning and Nursery Grounds of Selected Fish Species in UK Waters*. https://www.cefas.co.uk/publications/techrep/techrep147.pdf
42 Coull, K. A., Johnstone, R. & Rogers, S. I., 1998. *Fisheries Sensitivity maps in British waters*. 63 https://www.cefas.co.uk/media/o0fgfobd/sensi_maps.pdf
43 Cornwall IFCA, 2022. Research & Environment. *Cornwall Inshore Fisheries and Conservation Authority (CIFCA)* https://www.cornwall-ifca.gov.uk/Research_Environment#R2Finfish

Species	Spawning Season	Site within Spawning Area	Site within Nursery Area
Common skate *Dipturus batis*-compex	N/A	No	No
Thornback ray *Raja clavate*	N/A	No	No
Spotted ray *R. montagui*	N/A	No	No
Undulate ray *R. undulata*	N/A	No	No
Herring *Clupea harengus*	N/A	No	No
Cod *Gadus morhua*	January – April (peak **February – March**)	**Yes (low intensity)**	**Yes (low intensity)**
Whiting *Merlangius merlangius*	February – June	**Yes (low intensity)**	**Yes (low intensity)**
Blue whiting *Micromesistius poutassou*	N/A	No	No
Blue ling *Molva dypterygia*	N/A	No	No
Ling *M. molva*	February – May	**Yes (low intensity)**	No
European hake *Merluccius merluccius*	January – June (**February – March**)	**Yes (low intensity)**	No
Anglerfish *Lophius piscatorius*	January – June	No	**Yes (high intensity)**
Horse mackerel *Trachurus trachurus*	March – August (**May – June**)	**Yes**	No
Sandeels Ammodytidae	December – February	**Yes (high intensity)**	No
Mackerel *Scomber scombrus*	March – August (**May – June)**	**Yes (low intensity)**	**Yes (high intensity)**
Plaice *Pluronectes platessa*	December – March (**January – February**)	**Yes (low intensity)**	No
Sole *solea solea*	March – May (**April**)	**Yes (high intensity)**	No

Commercial Shellfisheries

10.2.5 The most significant fishery within the Fal is the harvest of bivalve molluscs, most specifically native oyster (*Ostrea edulis*), Pacific oyster (*Crassostrea gigas*), mussels (*Mytilus* spp.) and two scallop species (*Aequipecten opercularis* and *Mimachlamys varia*). The harvest of oysters within the Fal estuary is governed by the Fal Fishery Order 2016. Table 10-2 presents shellfish landing statistics for the Fal estuary from 2018 – 2021 and shows that the harvest of scallops is the dominant fishery in terms of landings.

Table 10-2: Shellfish landing statistics (kg) from the Fal Estuary (Cornwall IFCA data[44] [45] [46])

Season	Native Oyster	Mussels	Queen Scallops	Scallops	Pacific Oysters	Cockles	Winkles	Whelks
2018 – 2019	36,076	4,443	82,335	843	2,101	225	702	20
2019 – 2020	19,244	1,840	91,731	1,038	10,213	0	594	0
2020 – 2021	12,332	686	87,876	331	492	0	639	0

Migratory Fish

10.2.6 The area of the English Channel at the mouth of the Fal Estuary is an important migration route for migratory fish such as lamprey, salmonids, allis shad *Alosa alosa* and twaite shad *A. fallax* and European eel *Anguilla anguilla*. Many migratory species are listed on Annex II of the EU Habitats Directive 92/43/EEC and are likely to use the waters of the Fal estuary during their migration, although none are qualifying features of the Fal and Helford SAC[47].

10.3 Potential Impacts and Likely Effects

10.3.1 The following sensitive receptors have been identified:

- Commercial finfish species, including bass, cod, plaice and others that use the site as spawning/ nursery areas as identified in Table 10-1; and
- Commercial shellfish species, including native and Pacific oyster, mussels and scallops.

10.3.2 Table 10-3 and Table 10-4 present a summary of the scoping process, identifying which likely environmental effects, with respect to commercial finfish and shellfish receptors, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 10-3: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Temporary and permanent exclusion of fishermen/ fishing effort from fisheries/ harvesting areas in the vicinity of the site.	Yes	Potential adverse effects due to increased vessel activity around port structures during entire construction process.
Temporary and permanent displacement of stock away from the site	Yes	Potential adverse effects due to increased vessel activity around port structures during entire construction process and specific

44 Stidwell, H., Sturgeon, S., Street, K., Trundle, C. & Jenkin, A., 2021. *Season 2018-2019 Permit Statistics Report*. 23 https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Research_Reports/18-19-CIFCA-FOP-Stat.pdf (2021).
45 Sturgeon, S., Street, K., Trundle, C. & Jenkin, A., 2021. *Season 2019-2020 Permit Statistics Report*. 24 https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Research_Reports/19-20-CIFCA-FOP-Stat.pdf
46 Sturgeon, S., Street, K., Trundle, C. & Jenkin, A., 2022. *Season 2020-2021 Permit Statistics Report*. 25 https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Research_Reports/20-21Fal-Oyster-Stats-.pdf
47 JNCC, 2004. Fal and Helford - Special Areas of Conservation. *Special Areas of Conservation: Sites* https://sac.jncc.gov.uk/site/UK0013112

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		construction activities including piling and dredging
Temporary and permanent depletion of stock	Yes	Potential adverse effects due to increased vessel activity around port structures during entire construction process and specific construction activities including piling and dredging

Table 10-4: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Permanent displacement of fishing effort	Yes	Increased or altered vessel activity around Port causing adverse effects. This is unlikely to be significant but will be considered in the ES.

10.4 Approach and Methodology

Consultation

10.4.1 Consultations with CIFCA, the Local Authority (Cornwall County Council) and other relevant stakeholders will be made to understand in greater detail the exact nature and extent of commercial finfish and shellfish operations around the site. This consultation will include discussions with local fishing industry and associated businesses.

Impact Assessment

10.4.2 An impact assessment of the proposed development will be undertaken and will rely on survey information obtained from the desk-based literature review. This assessment will be conducted with consideration to any/all embedded mitigation.

10.4.3 Effects on commercial species and fishing operations within the site, in adjacent areas of water and on nearby designated sites will be assessed. An assessment of the potential effects of the proposed development will be undertaken and will rely on desk-based information. Additional information such as construction drawings/ information and construction methodologies and operational procedures will be used to inform the assessment. Where additional mitigation will be required to reduce the level of significance of effects, this will be detailed.

10.4.4 The results of this assessment will be presented within a Commercial Finfish and Shellfish chapter in the ES.

10.5 Preliminary Discussion of Mitigation and Enhancement Measures

10.5.1 No mitigation and enhancement measures have been identified at this stage.

11. TERRESTRIAL ECOLOGY AND ORNITHOLOGY

11.1 Introduction

11.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development of Falmouth Docks for terrestrial ecology and ornithology (both terrestrial and water birds). Section 9: Marine Ecology provides information on the marine environment.

11.2 Site Information and Baseline Conditions

11.2.1 There are several statutory sites designated for their ecological importance within 20 km of the site for international level designations, and within 5 km of the site for national and local level designations, see Table 11-1. In terms of ornithology, marine SPAs are also relevant and are included where appropriate.

Designations

Table 11-1: Designated Sites

International	• Fal and Helford Special Area of Conservation (SAC) – within the site (largely comprising marine and coastal habitat). • Falmouth Bay to St Austell Bay Special Protection Area (SPA) – within the site • Carinne Common SAC – 9.9 km northeast • The Lizard SAC – 12.2 km southwest • Godrevy Head to St Agnes SAC – 18.9 km northeast
National	• Swanpool Site of Special Scientific Interest (SSSI) – 1.6 km southwest
Local	• Swanpool Local Nature Reserve (LNR) – 1.6 km southwest

Habitats

11.2.2 Based on a review of aerial photography, the dominant habitats present on the application site are hardstanding and buildings associated with the current port activities. The buildings largely appear to be warehouse style, with several supporting flat roofs.

11.2.3 The site supports relatively limited vegetation, with a few small and isolated areas of scrub and ephemeral vegetation.

Species

11.2.4 The buildings, particularly those supporting flat roofs, have the potential to support breeding birds, such as gulls. They are considered unlikely to support bats. This would be confirmed during site surveys.

11.2.5 The vegetative habitat described in this section provides limited potential for breeding birds. There is also the potential for invasive species to be present. The potential for rare plants or other terrestrial faunal species to be present within the application site is considered to be low. A full assessment of the species present on and adjacent to the application site would be made during site surveys.

11.2.6 The 258, 98 ha Falmouth Bay to St Austell Bay SPA, which the site forms part of, supports wintering Annex I qualifying species black-throated diver *Gavia arctica*, great northern diver *Gavia*

immer and Slavonian grebe *Podiceps auritus*. Other sensitive breeding, foraging and wintering bird species are present in the wider area.

11.3 Potential Impacts and Likely Effects

11.3.1 The following potential sensitive receptors have been identified:

- Nesting birds: bird's nests could be damaged or destroyed if vegetation or buildings are removed during the bird nesting season.
- Other protected habitats and species could potentially be impacted by the development of the site, if considered likely to be present following the site surveys.

11.3.2 Impacts on foraging and wintering birds in the wider area, including those listed as qualifying features of the SPA, could potentially occur as a result of the development, including possible changes to intertidal habitats.

11.3.3 There is potential for invasive species to be present on the site, which could be caused to spread through demolition and construction processes.

11.3.4 Any potential impacts on Fal and Helford SAC would be marine in nature and would be assessed within the marine ecology chapter.

11.3.5 The international level designations of Carinne Common SAC, The Lizard SAC and Godrevy Head to St Agnes SAC are considered to be located outside of the zone of influence of the site. Bird species are not listed as notifiable features at either of the aforementioned SAC sites, with the sites typically designated for supporting rare habitats such as heathlands. Godrevy Head to St Agnes SAC is also designated for supporting the Annex II species early gentian *Gentianella anglica*. Given the relatively large distances between the application site and the SACs and given that the site is separated from the designated sites by the urban development of Falmouth, as well as smaller settlements and open farmland, the proposed development is not considered likely to significantly and negatively impact upon these internationally designated sites.

11.3.6 Swanpool SSSI and LNR are also considered to be located outside of the zone of influence of the application site. The SSSI and LNR are separated from the site by the urban development of Falmouth town, whilst the designations are for the presence of brackish conditions and a rare bryozoan, the trembling sea-mat *Victorella pavida.* These are not considered likely to be impacted by the proposed development due to the urban nature of the designated sites.

Table 11-2 and Table 11-3 present a summary of the scoping process, identifying which likely environmental effects, with respect to the proposed development at Falmouth Docks, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 11-2: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Bird collision risk	No	Protected or notable species of birds from marine designated sites are likely to be present surrounding the site. Birds may use the buildings and limited areas of scrub for nesting. There is potential for these species to be sensitive to the presence of large structures such as cranes, although the cranes to be used will be of a similar scale to those used in the baseline scenario as part of the active port operations. It is considered,

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		therefore, that any birds in and around the site will be habituated to the effects and the presence of cranes. In addition, this effect is expected to be temporary compared to the permanence of the existing cranes.
Lighting disturbance	No	Lighting levels are not expected to change significantly during the construction of the proposed development. Any protected species utilising the site will already be habituated to lighting at the active port, whilst Swanpool SSSI and LNR are a significant distance (1.6 km) from the site and are considered to not be negatively impacted.
Changes to air quality	No	The site is located in an active industrial area and supports limited habitats of limited ecological importance. Long term negative changes to air quality are not expected.
Habitat loss and damage	No	The site is dominated by habitats of negligible ecological importance and additionally supports limited habitats of limited ecological importance. Any losses of habitat are not considered to be significant.
Noise and visual disturbance	No	Any species present at the site will likely already be habituated to the activities taking place within the port. Any additional noise and visual disturbance (including that arising from piling and rock blasting) will be temporary and is not considered to be of greater significance than the current baseline level.
Contamination of habitats and species as results of mobilisation of contaminants.	No	There is potential for accidental spillages during construction. However, the site is within an industrial setting, supporting habitats of limited ecological importance. Therefore, the impact of contamination on terrestrial habitats is expected to be negligible. Birds may utilise the buildings on site for nesting, although it is considered unlikely that a pollution event would significantly impact on such protected species.
Impact on international designated sites of nature conservation importance	No	The impacts of construction on birds including those for which Falmouth Bay to St Austell Bay SPA is designated are considered likely to be negligible, as those in the vicinity of the port are likely to be habituated to activity already occurring. Impacts from changes to foraging habitat, including hydrodynamic changes to inter-tidal habitat will be assessed through the Habitats Regulation Process (HRA), but are unlikely to be significant. There are no terrestrial international designated sites of nature conservation importance located within 5 km of the application site.
Impacts on nationally designated sites of nature conservation importance (located more than 500 m from the application site)	No	Swanpool SSSI is located 1.6 km from the application site, separated by the urban development of Falmouth. The impacts of construction in an already active port upon this designated site are considered to be negligible.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Impacts on nationally designated sites of nature conservation importance (located less than 500 m from the application site)	No	There are no nationally designated sites of nature conservation importance within 500 m of the application site.

Table 11-3: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Bird collision risk	No	The proposed development will not significantly increase the height of the current port structure above the baseline level. The presence of FLOW devices is not considered to increase the bird collision risk as moving blades (*in situ* within operational wind farms) are considered to be the main cause of collision; the FLOW blades at the site will be stationary and of a similar height to vessels known to use the site already. Therefore, the increase in risk of bird collisions is considered to be negligible.
Lighting disturbance	No	Any protected species utilising the application site will be habituated to the current lighting scheme associated with port operations. It is considered likely that there will be no significant increase to the lighting levels above the baseline.
Changes to air quality	No	The application site supports limited habitats of limited ecological importance. Terrestrial designated sites are a significant distance from the application site, separated by urban development and are therefore not considered likely to be impacted by any changes in air quality.
Increased human activity	No	Any protected species utilising the site are considered likely to already be habituated to the presence of humans. The birds for which the SPA is designated would largely be foraging offshore far enough away from the site that they would not be impacted by additional human activity at the site itself. The brackish conditions and presence of a rare trembling sea-mat for which Swanpool SSSI and LNR are designated are not considered to be significantly impacted by a greater number of visitors to the area.
Overshadowing	No	The proposed development will not significantly increase the height of the current port structure above the baseline level and therefore no significant effect of overshadowing is considered likely.
Noise and visual disturbance	No	Any protected species utilising the site are considered likely to be habituated to noise and visual disturbance associated with the current port activities. Noise and visual disturbance associated with the proposed development is not considered to be significantly greater than the baseline level.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Impacts on internationally designated sites of nature conservation importance	No	The impacts of the completed development on birds including those for which Falmouth Bay to St Austell Bay SPA is designated are considered likely to be negligible, as those in the vicinity of the port are likely to be habituated to activity already occurring. Impacts from changes to foraging habitat, including hydrodynamic changes to inter-tidal habitat will be assessed through the HRA process, but are unlikely to be significant. There are no terrestrial internationally designated sites of nature conservation importance located within 5 km of the application site.
Impacts on nationally designated sites of nature conservation importance	No	Swanpool SSSI is located 1.6 km from the application site, separated by the urban development of Falmouth. The impacts of activities associated with the proposed development are not considered to be significantly greater that the baseline level.

11.4 Approach and Methodology

11.4.1 It is proposed to scope out terrestrial ecology and ornithology from the ES. However, the following will be undertaken as part of the planning application and HRA process:

- Ecological Impact Assessment (EcIA) – covering terrestrial ecology;
- Habitats Regulation Assessment – which will consider potential effects on the SPA and SAC, as well as other designated sites potentially affected by the proposed development. Outputs of modelling undertaken for Section 5: Coastal Processes and Sediment Regime will be used to determine potential impacts to designated sites.

11.4.2 In terms of the EcIA, biological data will be purchased from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS). This will include the purchase of information on non-statutorily designated sites, including County Wildlife Sites. In addition, publicly available ecological data will be obtained and reviewed.

11.4.3 An extended Phase 1 habitat survey/UKHab survey will be undertaken of the terrestrial part of the site to assess habitats and species present on the site, and further surveys will also be undertaken if considered necessary following the initial survey.

11.4.4 An EcIA will be produced, presenting the results of the surveys and desk study. This would make commitments to ecological mitigation and enhancement in line with legislation and planning policy and in accordance with CIEEM guidance.

11.5 Preliminary Discussion of Mitigation and Enhancement Measures

11.5.1 The ecological mitigation and enhancement strategy for the site would follow a precautionary approach and would include the following measures, to be identified through the EcIA:

- Should the demolition of buildings, or the clearance of any vegetation, particularly scrub, be required to facilitate the proposed development, then this should take place outside of the bird nesting season, which is typically from March to August inclusive.
- If demolition or vegetation removal is required to take place during the bird nesting season, then a nesting bird check should be carried out by a suitably qualified ecologist. If an active

nest is identified, the ecologist would indicate a buffer of vegetation of approximately 5 m around the nest which cannot be cleared until the chicks have fledged.

- Should bats be identified using the buildings on the site, appropriate mitigation such as provision of alternative roosting opportunities would be agreed and developed, under licence to Natural England where appropriate.
- Appropriate ecological enhancement measures would be implemented, such as provision of bat and bird boxes and provision of new habitat features such as planters, biodiverse roofs and tidal terraces. A Biodiversity Net Gain (BNG) assessment would be undertaken for terrestrial habitats, to ensure that a minimum of 10% gain is achieved.

12. MARINE ARCHAEOLOGY

12.1 Introduction

12.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to marine archaeology.

12.2 Site Information and Baseline Conditions

Study Area

The study area for marine archaeology is the extent of the site, outlined in

12.2.1 Figure 12-1 along with known heritage receptors. The boundary of the marine archaeology study area defines the area where any potential impact on marine archaeology receptors may occur.

Baseline Conditions

12.2.2 The themes relevant to marine archaeology are:

- Palaeogeography (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts such as handaxes) including their setting.
- Seabed features including:
  - maritime sites (such as shipwrecks and associated material including cargo, obstructions, and fishermen's fasteners) including their setting;
  - aviation sites (aircraft crash sites and associated debris) including their setting; and
  - historic terrestrial debris found in a marine context.
- Extant and remains of demolished historic port infrastructure including wharves and jetties.
- The historic seascape character in and around the marine archaeology study area.

12.2.3 The archaeological themes above relate to the known marine resource and also the currently unknown marine archaeological resource.

Data Sources

12.2.4 For the purposes of this scoping section, the baseline of known heritage assets within the marine archaeology study area has been obtained from:

- The United Kingdom Hydrographic Office (UKHO), which comprises data for charted wrecks and obstructions.
- The National Heritage List for England maintained by Historic England, comprising data of designated heritage assets including sites protected under the Protection of Military Remains Act 1986 and the Protection of Wrecks Act 1973.
- The Historic Seascape Characterisation (HSC): South West Peninsula[48].

Known Archaeological Baseline

12.2.5 The baseline information presented here has been gathered following the best practice professional guidance outlined by the Chartered Institute or Archaeologists' (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment[49].

[48] Cornwall Council (2014) *Historic Seascape Characterisation: South West Peninsula*. Prepared for English Heritage.

[49] Chartered Institute for Archaeologists (2020) *Standard and Guidance for Historic Environment Desk-Based Assessment*. Published December 2014, updated in 2020. Available at https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf [accessed September 2022].

12.2.6 The following section provides a summary of the known marine archaeology and cultural heritage baseline within the marine archaeology study area, compiled from the data sources listed above.

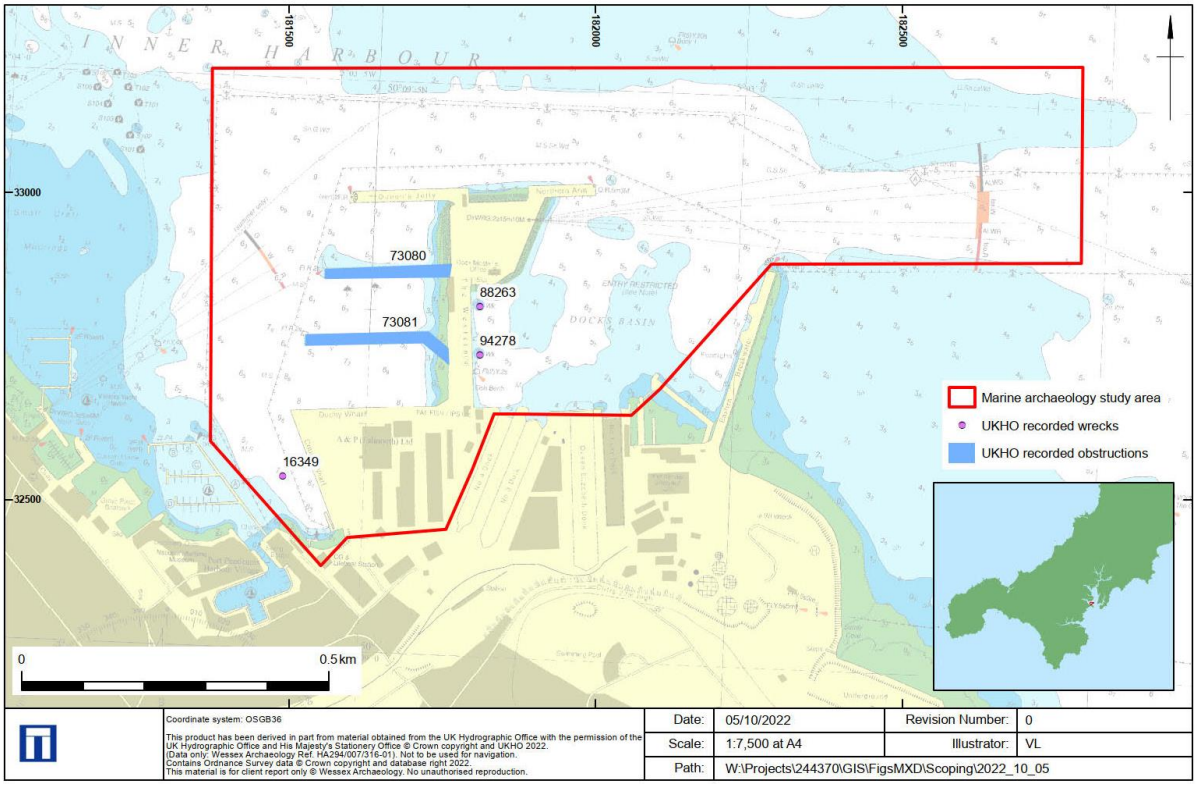


Figure 12-1: Location of Recorded Seabed Features within the Marine Archaeology Study Area, Wessex Archaeology 2022

Protected Sites

12.2.7 Wrecks protected under the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1978 are marked on appropriate UKHO Admiralty Charts. Interference or damage to these wrecks is considered a criminal offence.

12.2.8 There are currently no sites within the marine archaeology study area that are subject to statutory protection (or designation) from these acts, which can be used to protect marine archaeological sites.

UKHO Records

12.2.9 There are five records relating to three wrecks and two areas of obstructions located inside the marine archaeology study area, as follows:

- An unidentified dangerous wreck that was amended to 'dead'[50] in 1982 (UKHO ID 16349).
- An un-named dangerous wreck identified in 2017 as a sunken barge, measuring 11.5 m long, 5.2 m wide and with a height of 2.9 m and positioned in a north-south orientation (UKHO ID 88263).
- An unidentified dangerous wreck measuring 25.8 m long, 10.5 m wide and with a height of 4.2 m and positioned in a north-south orientation (UKHO ID 94278).

50 Not detected by repeated surveys, therefore considered not to exist

- An obstruction comprising an area of debris located on the seabed following the demolition of Empire Jetty between 2007 and 2008. The area measures 3972.86 m² (UKHO ID 73080).
- An obstruction comprising an area of debris located on the seabed following the demolition of King's Jetty between 2007 and 2008. The area measures 4786.94 m² (UKHO ID 73081).

Historic Seascape Characterisation

12.2.10 The historic seascape character of the region comprising the marine archaeology study area can be described as having the following character types, as defined by the South West Peninsula HSC (Cornwall Council 2014[48]):

- Coastal infrastructure comprising flood and erosion defence (sea defence);
- Industry comprising shipping industry (shipyard);
- Ports and docks (wet dock);
- Navigation comprising navigation features (channel) and navigation activities (anchorage and ferry crossing); and
- Recreation (marina).

Potential Archaeological Baseline

12.2.11 In addition to the known recorded sites located within the marine archaeology study area, there is also the potential for the presence of the following archaeological remains:

- Palaeogeographic material dating from the Palaeolithic onwards.
- Maritime craft dating from the Mesolithic to the modern period and associated ship related debris and artefacts. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered following surveys undertaken by the UKHO and others, and thus recorded in the archaeological record. However, there is still potential for the discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through surveys undertaken by the UKHO.
- Twentieth century aircraft and associated debris, particularly in relation to the Second World War.
- Remains of the infrastructure associated with Falmouth docks, built from 1858, and in particular remains of Empire Jetty and King's Jetty that were dismantled between 2007 and 2008.

12.3 Potential Impacts and Likely Effects

12.3.1 The following sensitive receptors have been identified:

- Known and potential palaeogeographic features and artefacts;
- Known and potential maritime sites and associated debris;
- Known and potential aviation sites and associated debris;
- Known and potential historic port infrastructure including dismantled jetties;
- Known and potential historic terrestrial debris; and
- The historic seascape character of the region.

12.3.2 All receptors have the potential to be damaged or destroyed if they interact with the dredging, demolition, and construction stages of the proposed development. All damage to archaeological

sites or material is permanent and recovery is limited to stabilisation or re-burial, limiting further interactions.

12.3.3 Potential impacts can be both direct and indirect.

- Direct impacts can include direct damage to structures, features, deposits and artefacts, and the disturbance of relationships between these elements and the wider surroundings. The setting of known and named wreck sites may also be impacted and in turn this could potentially affect the significance of such receptors.
- The indirect interactions upon the known and potential marine archaeological receptors occur as a result of changes to hydrodynamic patterns and sediment transport regimes, where these changes have occurred as a consequence of activities and structures associated with the project activities. Changes to hydrodynamic patterns and sediment transport regimes will be assessed as part of the Coastal Processes and Sediment Regime ES chapter, as outlined in Section 5: Coastal Process and Sediment Regime. Scour has a negative or adverse impact on marine archaeological receptors whereby it can expose material which leads to increased rates of deterioration through biological, chemical and physical processes. Alternatively, the redeposition of sediments following settling of sediment plumes can be beneficial to the preservation of marine archaeological receptors as greater sediment cover increases the potential for anaerobic environment, which inhibits a range of biological, chemical and physical degradation processes.

12.3.4 Table 12-1 and Table 12-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to marine archaeology, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e. 'scoped out'), along with a justification for this decision.

Table 12-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Physical disturbance to the seabed and sub-seabed during the dredging, demolition, and construction stages of the proposed development	Yes	Potential to cause direct damage to known and potential palaeogeographic receptors and to known and potential seabed features (maritime, aviation and terrestrial debris) and historic port infrastructure receptors. For example, the method of construction (for instance piling) used for the 50 m extension of Queen's Wharf, the installation of a mooring dolphin at its western extent and the construction of the new Western Wharf may directly impact receptors present on the seabed and below the seabed at these locations. The extent of the construction for the new Western Wharf and the type of construction vessels utilised, may directly impact receptors present on the seabed, including two recorded wrecks (UKHO ID 88263 and 94278), and receptors located below the seabed at these locations. Dredging around Queen's Jetty, Western Wharf and Duchy Wharf to a maximum depth of 10 m CD (chart datum) and dredging inside the dock's basin to a maximum depth of 5.5 m CD could impact receptors on the seabed and below the seabed. For example, the recorded dangerous wreck site (UKHO ID 94278) and the two areas of charted obstructions at the locations

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		of the dismantled Empire Wharf (UKHO ID 73080) and King's Wharf (UKHO ID 73081). Due to the historic nature of the wharves associated with Falmouth Docks, the removal of the Northern Arm, extended in 1938 and rebuilt in 1942, could lead to the destruction of a historic feature and, as such, would require mitigation to ensure it is recorded to a sufficient level prior to demolition works occurring.
Physical disturbance activities during the dredging, demolition and construction stages of the proposed development, causing indirect changes to hydrodynamic and sedimentary regimes leading to sediment reduction on the seabed	Yes	Potential to cause indirect changes to hydrodynamic and sedimentary regimes which could expose receptors (maritime, aviation, terrestrial debris and historic port infrastructure) to increased rates of deterioration through biological, chemical and physical processes. For example, the method of construction (for instance piling) used for the 50 m extension of Queen's Wharf, the installation of a mooring dolphin at its western extent and the construction of the new Western Wharf may cause indirect damage due to scouring alongside the pilings which could lead to destabilisation of receptors located beyond the site.
Physical disturbance activities during the dredging, demolition and construction stages of the proposed development, causing indirect changes to hydrodynamic and sedimentary regimes leading to sediment accretion on the seabed	Yes	Potential to cause indirect changes to hydrodynamic and sedimentary regimes which could cause sediment to cover receptors (maritime, aviation, terrestrial debris and historic port infrastructure) inhibiting a range of biological, chemical and physical processes. This is considered to be a beneficial effect.
Temporary change to the setting of a heritage receptor as a result of the dredging, demolition and construction stages	Yes	Potential to cause change to the setting of all receptors.
Temporary change to the character of the historic seascape	Yes	Potential to cause change to the historic seascape character of the area comprising the site.

Table 12-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Permanent change to the setting of a heritage receptor as a result of the dredging, demolition and construction stages	Yes	Potential to cause change to the setting of all receptors.
Permanent change to the character of the historic seascape	Yes	Potential to cause change to the historic seascape character of the area comprising the site

12.4 Approach and Methodology

12.4.1 This section provides a summary of the EIA methodology specifically relevant to marine archaeology ES Chapter. A detailed summary is presented in Appendix 4C.

12.4.2 A full desk-based technical assessment will be compiled comprising:

- Details of the legislations and policies relevant to marine heritage;
- Further utilisation of relevant archives, including Historic England's National Marine Heritage Record, Cornwall's Historic Environment Record and the Receiver of Wreck's database of droit reports of wreck and salvage, to better understand the known and potential marine archaeological resource in the marine archaeology study area. The setting and significance of this resource will also be assessed;
- Compilation and review of existing Ground Investigation (GI) logs from the 2008 Falmouth Cruise Project[51] to be incorporated into the Stage 1 review where relevant (see below);
- Completion of a Stage 1 geoarchaeological review of all geotechnical logs arising from planned GI works across the site and previous GI works at the site, with a focus on determining archaeological potential. Depending on the variability in the deposits, up to eight additional vibrocores will be obtained across the areas of impact. This will happen either during or after the GI works and the purposive cores required for geoarchaeological review may be taken as duplicate cores specifically for this assessment. Stage 1 comprises a geoarchaeological review of geotechnical and geological data establishing the likely presence/ absence/ distribution of archaeologically relevant deposits. Recommendations will also be made for a Stage 2 assessment, which targets deposits or samples identified in Stage 1 and comprises a description of the sequences recovered and production of a deposit modelling;
- Archaeologically assessed geophysical and Remotely Operated Vehicle survey data, where available and applicable;
- A walkover survey of the study area to inform the understanding of the existing marine and terrestrial heritage assets will be undertaken. The walkover survey will ground truth previously recorded heritage receptors relevant to the marine archaeological assessment and identify any new receptors that may be of relevance to the assessment. The proposed methodology will be presented in a Method Statement and agreed through consultation with the Archaeological Curator, Historic England, and the Regulator, the Marine Management Organisation;
- An assessment of the HSC character types that are present within, and in the region of, the study area; and
- Relevant mapping including Admiralty Charts, historic maps and Ordnance Survey, together with documentary sources and grey literature held by Wessex Archaeology and those available through the Archaeological Data Service and other websites.

12.4.3 The technical assessment will be completed following the best practice professional guidance outlined in the CIfA's Standard and Guidance for Historic Environment Desk-Based Assessment[49].

12.5 Preliminary Discussion of Mitigation and Enhancement Measures

12.5.1 Mitigation is necessary to reduce, remove or offset the impacts on marine archaeological receptors and fall under three main categories: avoidance; reduction of impact; and remedying and offsetting. Mitigation measures are project specific and tailored to the impacts of the proposed development on marine archaeological receptors. As such, the implementation of a marine

51 Historic Environment Services, 2008. *Falmouth Cruise Project Environmental Impact Assessment: Archaeological Report*. Prepared for Royal Haskoning DHV

archaeological Written Scheme of Investigation (WSI) that provides a mitigation framework will be prepared.

12.5.2 The WSI will set out the methods and standards for any proposed archaeological mitigation and will be in place throughout the dredging, demolition, and construction stages of the project. Furthermore, the preparation and utilisation of a WSI will be a condition on the marine licence for the project. The WSI would be agreed by the Regulator, with advice from the Archaeological Curator, prior to works commencing. The implementation of the WSI is the mitigation, rather than the document itself.

12.5.3 Impacts to both known and potential marine archaeological receptors are addressed through the application of additional mitigation measures. The mitigations suggested below will either avoid an impact altogether or ensure that where impact is unavoidable, further information is obtained for posterity or finds are recovered and preserved, thus further informing the archaeological record.

Geophysical Survey

12.5.4 Any geophysical survey data obtained for the proposed development should be assessed by specialists for indications of marine archaeological sites or features and the results should be used to supplement the technical report prepared as part of the EIA process.

12.5.5 Mitigating and offsetting impacts to palaeogeographic features such as palaeochannels may occur through investigation of existing geotechnical samples or undertaking further samples, which can enhance the palaeogeographic record for an area.

Avoidance and Archaeological Exclusion Zones

12.5.6 Government policy recommends the *in situ* preservation of known archaeological remains, therefore the ideal mitigation for such material is avoidance. This would be the recommended mitigation for the three UKHO recorded wreck sites located within the marine archaeology study area.

12.5.7 Appropriately sized Archaeological Exclusion Zones (AEZs) will be established around known features of higher archaeological value. No works will be undertaken within the extent of an AEZ during the project. AEZs may be amended (enlarged, reduced, moved or removed) following further data assessment of archaeological field evaluation and must be undertaken in consultation with the Archaeological Curator, Historic England, and the Regulator, the Marine Management Organisation.

12.5.8 AEZs will not be proposed for archaeological features of lower archaeological value, however such features should be avoided where practicable.

Receptor Investigation

12.5.9 Where a marine receptor cannot be avoided due to the proposed development, further assessment should be undertaken to confirm its nature, extent, and archaeological significance. Methods of ground truthing could include ROV or diver surveys.

12.5.10 If deemed necessary, the recovery or redeposition of archaeological receptors may be considered. Any intrusive works of this nature would need to be discussed and agreed with the Archaeological Curator and will require a Method Statement detailing the approved methodology of the works and post-excavation reporting, management, and conservation of the recovered material, to be agreed

with the Archaeological Curator prior to any works commencing. A marine licence may need to be applied for and granted. Also, recovery or redeposition of any wreck material must be reported to the Receiver of Wreck within 28 days under the Merchant Shipping Act 1995.

12.5.11 This would be the case if any of the recorded wrecks (UKHO ID 88263, 94278 and 16349) could not be avoided and equally for the removal of any surviving elements, or associated material, of the two dismantled wharves (UKHO ID 73080 and 73081).

Watching Brief

12.5.12 Due to the extensive and important history of Falmouth Port, it is likely that archaeological material could be discovered during the project, for example during the removal of surviving elements of the two areas of UKHO recorded obstructions relating to the dismantled jetties or during dredging of the harbour and basin. Furthermore, due to the proximity of the proposed development works to the two recorded wreck sites, their recovery may be agreed following consultation with the Archaeological Curator and, depending on the method of recovery undertaken, could include the requirement for a watching brief.

12.5.13 The presence of an archaeologist during defined work stages can reduce the risk of losing valuable information if an unknown marine heritage asset is encountered during the project or during recovery and/or redeposition of archaeological material. During a watching brief, the archaeologist can record material as it is discovered/ recovered using photographs, videos, drawings and written descriptions, and can intervene if any unexpected discoveries are made.

Protocol for Archaeological Discoveries

12.5.14 A project-specific Protocol for Archaeological Discoveries should be established to support the reporting of unexpected archaeological material during the project by the applicant or their contractors. Impact to unexpected archaeological material is reduced by enabling project staff to report their finds in a manner that is convenient and effective and promptly receiving archaeological advice and undertaking recording and/or conserving any objects that have been disturbed. Additional investigation of features with an uncertain identity or archaeological value can often mean their true nature and value can be better understood.

12.5.15 If an archaeologically important site or feature is subsequently discovered during project works, a temporary exclusion zone (TEZ) will be established to allow for further investigation to take place. The TEZ would then be re-evaluated, removed, or expanded, based on the results of further investigations.

13. HERITAGE

13.1 Introduction

13.1.1 This section summarises the potential impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to the terrestrial historic environment (including both terrestrial archaeology and built heritage). Marine archaeology considerations are covered separated in Section 12: Marine Archaeology.

13.2 Site Information and Baseline Conditions

13.2.1 While there are no terrestrial designated heritage assets within the site, the following designated heritage assets have been identified within an approximate 1 km Study Area surrounding the site:

- 1 Scheduled Monument;
- 218 Listed Buildings (1 Grade I, 11 Grade II*, 206 Grade II); and
- 1 Conservation Area (Falmouth Docks Conservation Area).

13.2.2 The locations of the designated heritage assets within 1 km are presented in Figure 13-1 – detailed images are available in Appendix 4D.

13.2.3 A 1 km Study Area was chosen for the purpose of this Scoping Report based on industry standard best practice and topographical considerations to ensure that the historic environment on land opposite Falmouth Docks, for example at Flushing, is also being considered.

13.2.4 There are no World Heritage Sites, Registered Parks and Gardens or Registered Battlefields within the site or Study Area.

13.2.5 The Pendennis Peninsula Fortifications Scheduled Monument (NHLE 1012134), the castle of which is also recognised as a Grade I Listed Building (NHLE 1270096), is broken down into three separate areas located at Falmouth Bay. The closest of these areas to the site are located approx. 250 m southeast to the south of Pendennis Rise. The fort has been scheduled on account of it being one of the finest examples of a post-medieval defensive fort in military occupation since the 16th century. Together with the scheduled St Mawes Castle (NHLE 1013807) and a Grade II listed Lighthouse at St Anthony's Head (NHLE 1136282) the fort guards the entrance to a natural anchorage point known as Carrick Road.

13.2.6 The Listed Buildings within the Study Area are mainly located at Flushing (a separate coastal village within the northern extent of the Study Area), the main roads facing the bay at Falmouth (e.g., North Parade, High Street, Market Street, Church Street and Bar Road) or at the scheduled fort. The majority of these appear to date from the 18th to 19th century attesting to the growth of the coastal town and the harbour areas throughout the later post-medieval period.

13.2.7 Falmouth Docks Conservation Area lies to the south and west of the site and broadly encompasses the fort and the core of the historic coastal town which mainly focuses on medieval to post-medieval settled areas. According to the Falmouth Conservation Area Appraisal[52] (Carrick District

[52] Berry, E, 1998. *Falmouth Conservation Area Appraisal*. Carrick District Council

Council, 1998) the special interest of the area is mainly expressed by its built environment from the medieval period to the 20th century.

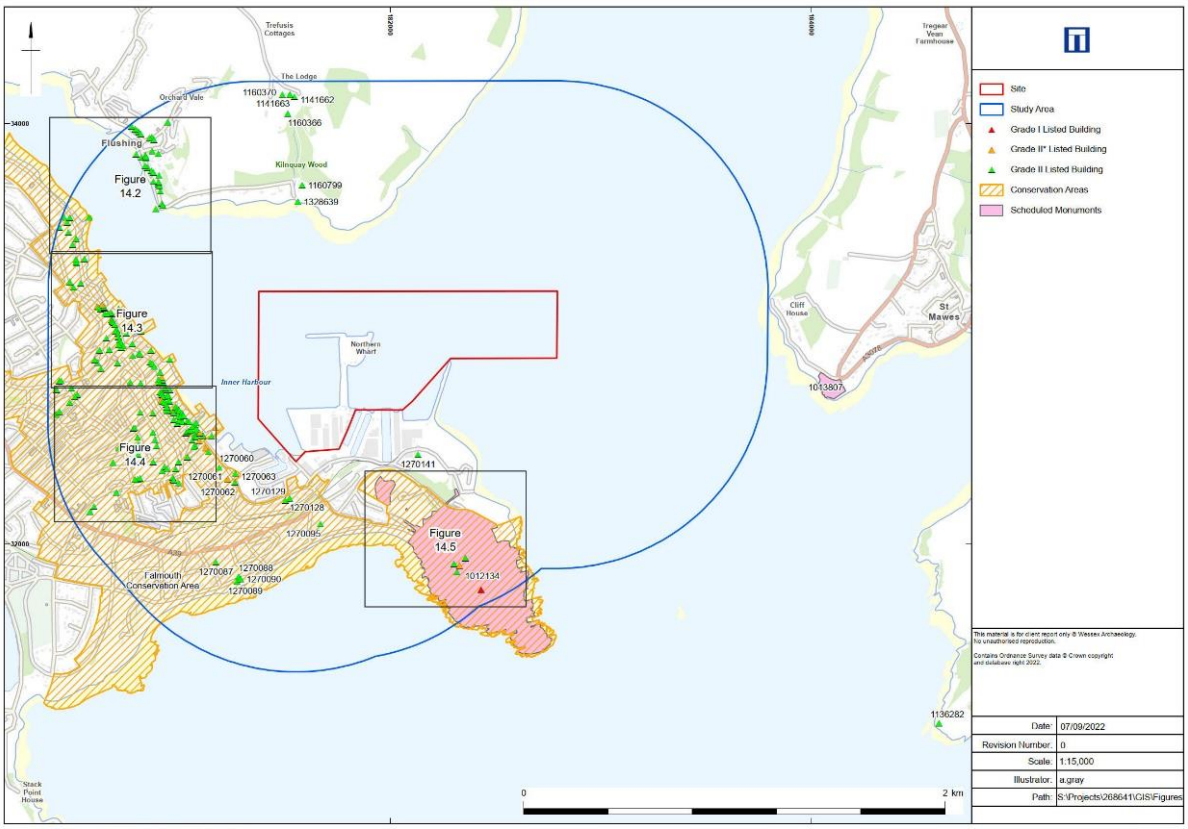


Figure 13-1: Overview of Designated Heritage Assets within the 1 km Study Area, Wessex Archaeology 2022

13.2.8 While no search of the Cornwall Historic Environment Record (HER) data was undertaken to inform this Scoping Report, it is anticipated that the known resource would broadly reflect the prehistoric and medieval to post-medieval developments of the town, however, this would need to be confirmed by a full HER search which will be required to support technical historic environment appendices. Furthermore, it must be noted that there is potential that some of the existing dockland features, such as berths, wharves and quays may even be recognised as non-designated heritage assets or locally listed buildings, however, this would need to be confirmed by the HER search.

13.3 Potential Impacts and Likely Effects

13.3.1 At present, it is considered that there is potential for the partial truncation or complete loss of archaeological remains during the construction process, and potential for harm to the significance of heritage assets based on a change in their setting, especially where setting contributes to significance during the operational phase of the proposed development. As such, the sensitive receptors identified include:

- Known and as yet unknown archaeological remains; and
- Designated heritage assets including the scheduled fort (NHLE 1012134), the scheduled St Mawes Castle (NHLE 1013807), Listed Buildings within and surrounding Falmouth (including St Anthony's Head (NHLE 1136282) and Falmouth Docks Conservation Area.

13.3.2 The archaeological remains likely comprise the medieval to post-medieval remains associated with the development of the port town and the docks, however, this would need to be confirmed by a HER search.

13.3.3 Therefore, the following impacts may lead to potential significant effects during the construction and operational phases of the proposed development:

- Physical impacts to known and unknown heritage assets during the construction works; and
- Harm to the significance of a designated heritage asset through a change in its setting once the Proposed Development is operational.

13.3.4 It is anticipated that there would be no impacts to the archaeological resource during the completed development stage of the proposed development as remains would have likely been removed unless they continue to form part of the dockland landscape within the site.

13.3.5 Table 13-1 and Table 13-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to the historic environment, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 13-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Partial truncation or complete removal of known and as yet unknown archaeological remains. At present, it is considered likely that these would comprise medieval to post-medieval remains associated with the development of the port town and the docks.	Yes	There is potential for the partial or complete loss of the significance of archaeological assets during the demolition and construction process.
Harm to designated heritage assets by way of a change in their setting	No	An assessment of harm to the significance of designated heritage assets by way of a change in their setting will be undertaken as part of the potential completed development effects as impacts during construction would be temporary in nature and not lead to lasting harm to the significance of heritage assets.

Table 13-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Harm to designated heritage assets by way of a change in their setting.	Yes	There is potential for harm to the significance of heritage assets based on a change in their setting on account of the proposed development. At present, it is anticipated that these heritage assets would include the scheduled fort (NHLE 1012134), St Mawes Castle (NHLE 1013807), Listed Buildings (including St Anthony's Head (NHLE 1136282)) and Falmouth Docks Conservation Area identified in Section 13.2. It is assumed that the majority of the Listed Buildings could be assessed as groups (where appropriate), however, the scope of assets to be

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		taken forward for consideration into the ES chapter would depend on the results of further desk-based assessment work (see Section 13.4).
Harm to known and unknown archaeological remains	No	It is anticipated that there would be no impacts to the archaeological resource during the completed development stage of the proposed development as remains would have likely been removed unless they continue to form part of the dockland landscape within the site.

13.4 Approach and Methodology

13.4.1 To further understand the known and potential historic environment baseline likely to be impacted by the proposed development, it is recommended that a Historic Environment Desk-based Assessment (HEDBA) is produced to inform the ES chapter. Based on the outcome of the 1 km study area review undertaken for this Scoping Report, For the purposes of the HEDBA, it is recommended that this covers two study areas, namely a 500 m study area surrounding the site to identify the known and potential archaeological resource, and a wider 1.5 km study area to identify where there is potential for harm to the significance of designated heritage assets due to a change in their setting caused by the proposed development, especially considering that the site and scheduled fort may have visual connections with other locations and/or heritage assets along Carricks Road.

13.4.2 As a minimum, the scope of the HEDBA would include:

- A review of the Cornwall HER dataset and National Heritage List for England (NHLE) data to identity the known historic environment resource within the Site and study area(s);
- A review of relevant online material, historic mapping and archive material at Cornwall Record Office (if required);
- A site walkover survey of the site;
- An assessment of the known and potential historic environment resource and significance of identified heritage assets likely to be impacted by the proposed development;
- An assessment of the impacts of the proposed development, including consideration of the setting of heritage assets.

13.4.3 In terms of the EIA methodology, there is no single standard guidance for the assessment of the likely effects of a development on the historic environment resource, however, this process is typically guided by the Institute of Environmental Management and Assessment (IEMA) *Principles of Cultural Heritage Impact Assessment in the UK*[53] (2021) and the *Design Manual for Roads and Bridges*[54] (revised 2020), even where developments do not include works affecting highways.

13.4.4 Combined with professional judgement, this is commonly recognised as the most rigorous methodology available for archaeology and cultural heritage assessment as part of the EIA process which firstly identifies the value/ importance of an asset and then considers the magnitude of change which, when combined, results into an overall score on likely effects. This score can either be significant or not significant in EIA terms. It is proposed that this methodology is used for the

[53] IEMA (2021) *Principles of Cultural Heritage Impact Assessment in the UK*. Institute of Environmental Management and Assessment. Available at: Principles of Cultural Heritage Impact Assessment - IEMA

[54] National Highways (2020) *Design Manual for Roads and Bridges*. Available at: Standards For Highways | Design Manual for Roads and Bridges (DMRB)

ES. Appendix 4E outlines the proposed assessment methodology and significance criteria for the HEDBA.

13.5 Preliminary Discussion of Mitigation and Enhancement Measures

13.5.1 Where possible, the development will be designed to avoid impacts to the archaeological and heritage resource. Where it is not possible to preserve heritage assets in situ, a proportionate programme of archaeological works is proposed which will lead to preservation by record by way of mitigation. The scope of mitigation would need to be agreed with the County Archaeologist advising Cornwall Council on archaeological matters and would be subject to an approved Written Scheme of Investigation (WSI).

14. NAVIGATION AND RECREATION

14.1 Introduction

14.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to navigation and recreation.

14.2 Site Information and Baseline Conditions

14.2.1 Falmouth, the UK Atlantic Gateway port, is the third deepest natural harbour in the world. Vessels entering UK & European waters will frequently be instructed to navigate to Falmouth for orders, due to the availability of well sheltered deep-water anchorages. Falmouth is a busy commercial port, dealing with cargo and ship repairs including the Falmouth dry-docks. Up the River Fal there are frequent ships movements, some laid up or awaiting cargoes or charters.

14.2.2 Vessel types navigating within Falmouth, specifically Carrick roads and the inner harbour range from deep-draughted vessels such as cargo vessels, tankers, military, and cruise ships through to leisure vessels, including dayboats, passenger boats, motorboats, sailing vessels as well as dinghy sailors, paddle boarders and kayakers. There are also a considerable number of working vessels including tugs, pilot boats, workboats, supply boats and passenger ferries, day trip and fishing vessels.

14.2.3 Sailors will frequently aim for Falmouth as their first port of call after transatlantic crossing or use it as their departure port for offshore passages. There are coastal and offshore sailors and those sailing only within the confines of the Fal estuary, including sports sailing from the sailing clubs and marinas. Falmouth has long been regarded as a safe haven for all types of vessels, and the numbers of vessels within Falmouth can swell in high season and all times of year as sailors head in to seek refuge from gales and heavy seas in the well sheltered waters.

14.2.4 Maritime users will also aim for Falmouth as a destination, staying in marinas and to take advantage of the plentiful supply of marine chandleries, suppliers, and maintenance/repair companies. Most visiting vessels, entering Falmouth, will transit the inner harbour aiming for marinas including Falmouth Haven, Port Pendennis, and Falmouth Marina.

14.2.5 The full breakdown of vessel types, concentration and frequency would only be accurately captured, and displayed in context to the proposed site following a full navigational analysis, undertaken and confirmed, following data analysis as part of the NRA process.

14.2.6 The following sensitive receptors have been identified, but not limited to:

- Commercial vessels;
- Leisure vessels;
- Environment (e.g., oil spills);
- Port stakeholders (port-based business);
- Marine industries (Fishing, aquaculture, aggregate delivery, renewable energy infrastructure; and
- Neighbouring Harbour Authorities/ users.

14.2.7 Table 14-1 and Table 14-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to navigation and recreation will be assessed in the EIA (i.e.,

considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 14-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Navigational Risk to all identified sensitive receptors	Yes	The level of risk to identified sensitive receptors is currently unknown. A full NRA will therefore need to be undertaken as part of the EIA process to fully assess and quantify this risk.

Table 14-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Navigational Risk to all identified sensitive receptors	Yes	The level of risk to identified sensitive receptors is currently unknown. A full NRA will therefore need to be undertaken as part of the EIA process to fully assess and quantify this risk.

14.3 Approach and Methodology

14.3.1 The Navigation Risk Assessment (NRA) will be undertaken in compliance with the Port Marine Safety Code (PMSC) and its associated Guide to Good Practice. The risk assessment method is based on concepts of "Most Likely" and "Worst Credible", which reflects the range of outcomes arising from a shipping accident and assesses the frequency of occurrence combined with the assessment of typical consequences to people, property, environment, and business. The full approach and methodology are presented in Appendix 4F.

14.4 Preliminary Discussion of Mitigation (Risk Control) and Enhancement Measures

14.4.1 The data gathering and stakeholder consultation meetings would identify existing risk control measures currently in place within Falmouth area. Additional risk control measures would be recommended if identified during the NRA process which could contribute to safer and more efficient operations.

14.4.2 Typical mitigation and risk control measures which may be appropriate could include controls such as:

- Vessel Traffic Services (VTS);
- Byelaws & General Directions;
- Compulsory Pilotage, Pilot Launch Escorts;
- Aids to Navigation (AtoNs);
- Towage;
- Survey & Dredging programme;
- Powers of Direction;
- Reduced Visibility procedures;
- Small boat registration;
- Website, navigation notices and memos, leisure craft information leaflet;

- Improved AIS/ VHF/ CCTV coverage/ compulsory AIS on inshore passenger Vessels;
- Port Marine Safety Code (PMSC) compliance and external audits (ISO); and
- Improved stakeholder communications.

14.4.3 Mitigation measures and risk control measures will be confirmed once the NRA is complete.

15. TRANSPORT

15.1 Introduction

15.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to Transport in terms of road traffic. Vessel traffic has been considered in Section 14: Navigation and Recreation.

15.1 Site Information and Baseline Conditions

15.1.1 The A39 starts (or ends) at Falmouth Docks and passes through Falmouth (as Melvill Road, Western Terrace and Dracaena Avenue), and subsequently forms the main road connecting Falmouth and Truro. The A39 joins the A390 in Truro and the combined road runs around Truro town centre (Tregolis Road) until they split. After the split with the A390, the A39 heads north (known as Newquay Road) through Trispen until it joins the A30. The A30 is the main highway link west to Penzance and Lands End, and east to Exeter where it connects into the M5 and Honiton where it connects into the A303.

15.1.2 The site is located approximately 800 m north of Falmouth Docks railway station (approx. ten-minute walk). All trains are operated by Great Western Railway to and from Truro. From Truro there are main line connections west to Penzance and east to Plymouth, Exeter and beyond including lines to London Waterloo and Paddington station.

15.1.3 Public transport includes local passenger ferry services connecting Falmouth to Tolverne and Truro (seasonal), and to Flushing and St Mawes (year-round). A park and float facility operates from Falmouth, providing a ferry link from the out-of-town car parking facility at Ponsharden with the town centre.

15.1.4 The closest bus stop is located on Bar Road approximately 480m from the site (approx.6-minute walk). Service 67 operates from this stop and provides the following route: Falmouth Coastal Circular – Falmouth Moor – Maritime Museum – Pendennis – Seafront – Gyllyngvase – Swanpool.

15.1.5 Other services operating within Falmouth are summarised in Table 15-1.

Table 15-1: Bus Services

Bus Service No.	Route
35/35A	Falmouth - Mawnan Smith - Halford Passage - RNAS Culdrose – Helston Falmouth - Gweek - Helston
42	Falmouth - Stithians - Carnkie - Camborne
60	Falmouth Town Shuttle
65/65A	Falmouth Town Service
69/69A	Falmouth - Penryn - Flushing - Mylor Bridge Falmouth - Penryn - Mabe - Tremough

15.1.6 There are no national, regional or local cycleways within the vicinity of the site.

15.1.7 Cornwall County Council's automatic traffic counters recorded two-way flows for annual average daily traffic (AADT) in 2007[17] including the percentage of HGVs at key locations along the A39,

which is the principal road through Falmouth to and from Falmouth Docks. Annual average two-way flows for peak morning (AM) and afternoon (PM) flows of all vehicles were recorded (see Table 15-2:).

Table 15-2: Annual Average Peak Hour Two-Way Traffic Flows in Falmouth in 2007

Road Location	Peak AM	Peak PM
A39 Ponsharden	1,950	2,300
A39 Dracaena Avenue	1,000	1,200
C7 Budock Hospital	1,500	1,600

15.2 Potential Impacts and Likely Effects

15.2.1 The following sensitive receptors have been identified:

- Infrastructure receptors:
  - Local distributor roads (e.g. Melvill Road), minor main roads and main roads;
  - Cycle routes;
  - Bus stops and routes; and
  - Falmouth Docks railway station.
- Transport user receptors:
  - Cyclists;
  - Pedestrians including children, elderly and those with physical or mental impairment.
  - Road users; and
  - Public transport users.

15.2.2 It should be noted that Section 14: Navigation and Recreation considers impacts and likely effects of marine transport users.

15.2.3 Table 15-3 and Table 15-4 present a summary of the scoping process, identifying which likely environmental effects, with respect to Transport, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 15-3: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Severance	Yes	The proposed demolition and construction works are not expected to require changes to existing roads or establish new accesses which could increase severance. However, it is noted that additional demolition and construction traffic is expected to be generated but will be temporary. The number of construction vehicles is currently unknown, and therefore this is scoped due to the uncertainty.
Driver delay	Yes	The demolition and construction traffic may lead to increased driver delays, although these will be temporary in nature. The number of construction

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		vehicles is currently unknown, and therefore this is scoped due to the uncertainty.
Pedestrian and cyclist delay	Yes	The demolition and construction traffic may lead to delays on pedestrians (on the footway or crossing the road at the nearby priority junctions), however this is considered a temporary effect. The number of construction vehicles is currently unknown, and therefore this is scoped due to the uncertainty.
Accidents and safety on local highway network	Yes	Demolition and construction traffic utilising site access may increase accident risk due to increase in traffic and associated movements however this can be managed through a Construction Traffic Management Plan (CTMP) and is considered a temporary effect.
Amenity for transport users	No	The introduction of demolition and construction traffic is not expected to affect the amenity for transport users on this route and further routes.
Change in public transport trips	No	The bus stop located on Bar Road is not expected to be directly affected by demolition and construction traffic.

Table 15-4: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Severance	Yes	Potential traffic intensification due to the increase in cruise passengers at the site access may increase severance; this will be mitigated by the introduction of improved pedestrian/cycle crossing facilities.
Driver delay on local highway network	Yes	Additional traffic due to the increase in number of coaches and taxis (provision for ~40 coaches and a taxi rank as part of the redevelopment) on the network may introduce delays.
Pedestrian and cyclist delay	No	The likely delay impact on pedestrians (on the footway or crossing the road at the nearby priority junctions) and cyclists from completed development is expected to be minimal.
Accidents and safety on local highway network	Yes	The completed development would result in an increase of local traffic flows. The increase in local trips may increase the risk of accidents occurring.
Amenity for transport users	No	The change in traffic associated with the development proposals is not anticipated to affect the amenity of transport users.
Change in public transport trips	Yes	Due to the expansion of the development, it is anticipated that there will be a change in public transport trips.

15.3 Approach and Methodology

15.3.1 The IEMA document 'Guidelines for the Environmental Assessment of Road Traffic' (1993)[55] will be used to assess transport environmental impacts of the proposed development.

15.3.2 The transport study area for the ES chapter will be informed by the following two rules, as set out in 'Guidelines for the Environmental Assessment of Road Traffic':

- Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles [HGVs] will increase by more than 30%; and
- Rule 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more.

15.3.3 The traffic assessment for the demolition and construction stage, will be limited to the roads immediately adjacent to the site and any roads further afield where Rule 1 is breached. It is expected that the roads to be assessed will be Bar Road, Melvill Road (A39), Bar Terrace and Tinners Walk.

15.3.4 The assessment scenarios are:

- Existing baseline: 2022 Weekday daily traffic flows;
- Future baseline + proposed development demolition and construction traffic; and
- Future baseline + proposed development + cumulative development (weekday daily traffic flows including growth from cumulative developments with flows on Bar Road, Melvill Road (A39), Bar Terrace and Tinners Walk, should cumulative scheme data be available).

15.3.5 The traffic assessment for the completed development traffic stage will be limited to the roads immediately adjacent to the site and any roads further afield where Rule 1 is breached. It is expected that the roads to be assessed will be Bar Road, Melvill Road (A39), Bar Terrace and Tinners Walk.

15.3.6 The assessment scenarios are:

- Existing baseline – 2022 Weekday daily traffic flows;
- Future baseline + proposed development traffic.
- Future baseline + proposed development + cumulative development (weekday daily traffic flows including growth from cumulative developments with flows on Bar Road, Melvill Road (A39), Bar Terrace and Tinners Walk, should cumulative scheme data be available).

15.3.7 The above effects relating to increases in traffic flows, will be assessed against the opening year of the proposed development, and the significance of effects will be quantified based on the following broad principles, as set out in the IEMA guidelines:

- **Low impact**: 30% increase in traffic (10% adjacent to sensitive receptors)
- **Medium impact**: 60% increase in traffic (20% adjacent to sensitive receptors)
- **High impact**: 90% increase in traffic (30% adjacent to sensitive receptors)

15.3.8 Where either Rule 1 or Rule 2 is breached the assessment will provide an analysis of potential environmental effects in accordance with the IEMA guidance including:

- Severance;
- Driver Delay;

[55] Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic, 1993

- Pedestrian Delay;
- Pedestrian Amenity; and
- Accidents and Safety.

15.3.9 Consideration will also be given to cumulative impacts and effects.

15.4 Preliminary Discussion of Mitigation and Enhancement Measures

15.4.1 The ES and supporting Transport Assessment will identify any necessary mitigation and/or enhancement measures, such as:

- Highways improvements (e.g., pedestrian crossing improvements, junction amendments, cycle facilities);
- Traffic safety measures (e.g., temporary signage, pedestrian routes) during the demolition and construction stage;
- Demolition and construction logistics optimisation through a CTMP; and
- Pedestrian, cycling and public transport measures.

16. NOISE AND VIBRATION

16.1 Introduction

16.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to terrestrial noise and vibration. Underwater noise is addressed in Section 17.

16.1.2 The impact of terrestrial noise on ecological receptors is considered in Section 11.

16.2 Site Information and Baseline Conditions

16.2.1 The noise climate on site and at the nearest sensitive receptors is expected to be dictated by:

- Operational activity at the docks, e.g., cruise liners, ship repair, cargo, etc.;
- Noise from recreational boats;
- Road traffic noise;
- Railway noise from Falmouth Docks station; and
- Commercial and industrial uses around the Falmouth Docks area.

16.2.2 The noise climate on site and at locations representative of the nearest sensitive receptors will be determined by appropriate baseline noise surveys.

16.2.3 No significant existing sources of ground-borne vibration have been identified around the site.

16.2.4 The following sensitive receptors have been identified following an initial review of satellite imagery for the Falmouth Docks area:

- Residential properties to the south of the docks, e.g., properties along Tinners Walk;
- Trelawny House Retirement Living on Bar Road; and
- Commercial uses around the Falmouth Docks area.

16.2.5 A detailed understanding of the receptors that may be affected will be undertaken through a review of available mapping and other databases.

16.3 Potential Impacts and Likely Effects

16.3.1 Table 16-1 and Table 16-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to terrestrial noise and vibration, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 16-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Effects due to demolition and construction noise	Yes	Demolition and construction noise levels may exceed baseline noise level and thresholds set in BS 5228:2009+A1:2014.
Effects due to demolition and construction vibration	No	The nearest human vibration sensitive receptors are expected to be approximately 250m from the site. Ground-borne demolition and construction vibration would not be perceptible at this distance.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Effects due to changes in road traffic noise levels during construction	Yes	Demolition and construction HGVs have the potential to cause short-term increases in road traffic noise levels.

Table 16-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Effects due to changes in road traffic noise levels during completed development	Yes	There is potential for an increase in road traffic noise due to larger cruise ships and cargo using the docks.
Effects due to noise from new fixed plant installations	Yes	There is potential for any new fixed plant installations to be audible against the residual background noise levels.
Effects due to activity noise from new noise sources at Falmouth Docks, e.g. FLOW/ offshore renewable technology (when docked in Falmouth)	Yes	New operational noise sources may be audible against the existing noise climate.
Effects due to activity noise from existing dock noise sources or noise from typical dock noise sources, e.g. noise from larger cruise ships	No	The level of noise from the existing dock noise sources would be quantified as part of the baseline noise survey and forms part of the existing noise climate. However, the operational effect of the potential increase in road traffic noise from larger cruise ships and cargo would be considered in the operational road traffic noise assessment.

16.4 Approach and Methodology

16.4.1 Attended and unattended baseline noise surveys will be completed to establish the noise climate on site and at the nearest noise sensitive receptors. The monitoring locations would be subject to a detailed review of the receptor locations that may be affected by the proposed development. Once determined, the approach to the baseline noise survey will be confirmed via consultation with Cornwall Council's Environmental Health team.

16.4.2 A vibration survey and assessment is not deemed necessary for the proposed development. Groundborne demolition and construction vibration are not expected to be significant at the nearest sensitive human receptors. Piling activities would typically provide the highest levels of groundborne vibration and vibration from piling maybe perceptible at distances of up to 100 m from the works. The nearest vibration sensitive receptors are expected to be approximately 250 m to the south-west of the site, at Tinners Walk. Any vibration from the operation of the proposed development is expected to be in-line with current dock operations and is highly unlikely to affect the nearest sensitive receptor given the distances involved.

16.4.3 Demolition and construction noise will be assessed to human receptors, in accordance with BS 5288-1:2009+A1:2014[56]. Demolition and construction noise thresholds and significance criteria will be identified through application of the ABC Method within Annex E of this Standard.

56 British Standards Institute, 2009. BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Noise. December 2008

16.4.4 The change in road traffic noise during the demolition and construction stage of the proposed development will be assessed at human receptors adjacent to the local road network, in accordance with the methodology of the Calculation of Road Traffic Noise (1988)[57] memorandum and the short-term magnitude of impact scale within LA 111[58].

16.4.5 The change in road traffic noise during operation of the proposed development will be assessed at human receptors adjacent to the local road network in accordance with the Calculation of Road Traffic Noise (1988)[59] memorandum and the short-term magnitude of impact criteria of LA 111[60]. The scenarios assessed will be based on the scenarios provided by the project transport consultant, but the assessment years will broadly comprise:

- A baseline year;
- An opening year; and
- A future year with and without cumulative schemes.

16.4.6 Noise emissions from new fixed plant installations for the completed development will be assessed in accordance with BS 4142:2014+A1:2019[61].

16.4.7 Noise emissions from new dock activities will be assessed against the existing noise levels at the nearest noise sensitive receptors. An assessment would be provided based on the likely audibility and character of the noise against the existing noise climate, and assessment of the relative change in noise levels due to new noise sources. However, such assessments would be limited to the impact of new noise sources, e.g. those associated with FLOW or offshore renewable energy sources (when docked in Falmouth).

16.5 Preliminary Discussion of Mitigation and Enhancement Measures

16.5.1 The potential for significant effects due to demolition and construction noise and vibration will be reduced by application of Best Practicable Means to reduce levels of noise and vibration at nearby sensitive receptors, and through appropriate operational restrictions such as limits on working hours or types of construction plant or equipment. These embedded mitigation measures will be documented within the Construction Environmental Management Plan (CEMP).

16.5.2 The potential for significant effects due to operational noise will be reduced through operational noise mitigation measures, where necessary, such as limits on noise output for new fixed plant installations or processes, restrictions on times of use for new noise sources, and use of screening to reduce noise emissions to the nearest sensitive human receptors.

57 Department of Transport and Welsh Office, 1988. Calculation of Road Traffic Noise
58 Highways Agency, 2020. Design Manual for Roads and Bridges. LA111
59 Department of Transport and Welsh Office, 1988. Calculation of Road Traffic Noise
60 Highways Agency, 2020. Design Manual for Roads and Bridges. LA111
61 British Standards Institute, 2014. BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound. October 2014

17. UNDERWATER NOISE

17.1 Introduction

17.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to underwater noise.

17.1.2 Sparse information is available for the assessment of effects of underwater vibration on fish and marine mammals. Consequently, although consideration of vibration will be indicated in the ES chapter based on limited information and professional judgment, the key criteria considered in the assessment will be for underwater noise.

17.2 Site Information and Baseline Conditions

17.2.1 Ambient underwater noise levels are highly variable, depending on a range of both natural and anthropogenic factors. Natural factors include sea state, rain, currents, movement of seabed materials, as well as sounds and vocalisations from marine fauna. These factors can result in seasonal and daily changes in the baseline underwater noise levels. Anthropogenic noise will also contribute to underwater noise levels and can include impulsive noise, such as that created by piling, and continuous noise, such as that created by shipping.

17.2.2 A dedicated underwater noise baseline survey is not expected to be required to inform the EIA process for the proposed development. This is because it is already foreseen that the peak sound levels that may be associated with the project (i.e., temporary demolition and construction works) will be substantially above background levels. A new baseline survey would neither add appreciably to our understanding of the present day noise climate, nor substantially alter the proposed assessment and mitigation methods.

17.2.3 The Fal Estuary is expected to have an underwater sound climate typical of a mixed-use estuary of the South West, being the location of maritime trade, fishing, dredging and recreation. The developed nature of Falmouth Harbour and the number of large commercial vessels using the water means that the existing underwater noise levels are anticipated to be high relative to further offshore and within the adjacent Falmouth Bay.

17.2.4 No dedicated underwater noise studies have so far been identified that examine the Fal itself. A number of studies in Falmouth Bay that have recorded underwater noise, as part of the FabTest marine renewables site, provides a good basis to understand the likely shipping noise baseline of the wider area. These include:

- Long-term underwater sound measurements in the shipping noise indicator bands 63 Hz and 125 Hz from the port of Falmouth Bay, UK[62];
- Underwater Sound Levels at a Wave Energy Device Testing Facility in Falmouth Bay, UK[63].

17.2.5 An MMO report (2015)[64] notes that a wide range of sources contribute to underwater noise levels and, in particular, identified shipping, fishing and dredging to be the principal anthropogenic

62 Garett J.K., Blondel P. H., Godley B. J., Pikesley S. K., Witt M. J., Johanning L. (2016) Underwater sound levels at a wave energy device testing facility in Falmouth Bay, UK. Marine Pollution Bulletin 110 (2016) 438–448
63 Garett J.K., Witt M. J., Johanning L. (2016). Underwater Sound Levels at a Wave Energy Device Testing Facility in Falmouth Bay, UK. Chapter 39.
64 Marine Management Organisation (2015). Modelled Mapping of Continuous Underwater Noise Generated by Activities. ABPmer. MMO Project No: 1097. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/457319/Underwater_noise_report_MMO_1097.pdf [Accessed Sept 2022].

continuous underwater noise sources in the locations relevant to the South Marine Plan[65] (MMO, 2015 as updated MMO, 2018). The underwater noise sources within the South West Inshore Marine Plan[66] (MMO, 2021) area are likely to be of a similar nature to those presented within the South Marine Plan document and as such are considered to provide a suitable reference for the proposed development.

17.2.6 Table 17-1 identifies the worst-case anthropogenic continuous noise sources associated with shipping, fishing and dredging vessels that are likely to be in the vicinity of the proposed development. Noise levels from a range of commercial shipping vessels and of dredging vessels have been identified given the different cargoes transported in the vicinity the Fal Bay and a number of maintenance dredging equipment examples.

Table 17-1: Typical and Worst-cast Acoustic Properties of Anthropogenic Continuous Noise Sources, MMO 2015

		Source Level (dB re 1uPa m)				Frequency (Hz)	
Activity	**Sub-activity**	**Range**	**Mean**	**Median**	**Max**	**Range**	**Peak**
Dredging	TSHD during dredging	184-188	187	187	188	30-63,000	40-500
Dredging	Backhoe during dredging	163-186	178	175	186	3-20,000	35-500
Shipping	Bulk cargo in transit	175-192	186	184	192	10-40,000	20-1,000
Shipping	Container in transit	169-198	186	181	198	1-120,000	8-33
Shipping	Fishing trawler in transit	110-158	150	143	158	100-20,000	ND
Shipping	loaded barge in transit	161-171	167	166	171	45-7,070	37-5,000

17.3 Potential Impacts and Likely Effects

17.3.1 For the reasons explained above, the primary receptor for this section is the underwater noise climate. In order to define the effects upon this receptor, the assessment of effects upon secondary receptors, such as marine mammals and fish, will be used. Refer to Section 9 for the specific marine species that have the potential to be affected by underwater noise.

17.3.2 The main underwater noise emissions of concern are those associated with the piling operations that will be required for the construction of the new quay areas, and in the activities required to remove bedrock areas to deepen the new berth areas. Underwater noise will also be generated by the dredging operations, which will include both capital dredging and potential subsequent maintenance dredging.

17.3.3 Table 17-2 and Table 17-3 present a summary of the scoping process, identifying which likely environmental effects, with respect to underwater noise, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

65 Marine Management Organisation (2018). South Inshore and Offshore Marine Plan. Available online at: https://www.gov.uk/government/publications/the-south-marine-plans-documents. [Accessed Sept 2022].
66 Marine Management Organisation (2021). South West Inshore and Offshore Marine Plan. Available online at: https://www.gov.uk/government/publications/the-south-west-marine-plans-documents. [Accessed Sept 2021].

Table 17-2: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Significant but temporary increase to underwater noise may impact marine mammals and fish due to noise generated during demolition and construction activities. This is most relevant to underwater noise generated by piling activities and in removal of rock substrate to deepen new berths but will also include some generation of underwater noise by vessels required during the construction process.	Yes	Although levels of underwater noise unlikely to cause mortality to marine mammals, it has the potential to cause temporary or behavioural impacts to marine mammals, especially to the more sensitive species such as Harbour Porpoise. There is the potential to cause mortality to fish, especially those with swim bladders within a certain distance of the piling activity. Outside this range there is potential sub-lethal and behavioural impacts to fish that will need to be considered.

Table 17-3: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Potential increase to underwater noise generated by maintenance dredging activities that will be required to maintain depth at the berths and manoeuvring areas.	Yes	The levels of sedimentation and hence maintenance dredging requirements are not currently fully understood due to the early stage of the design. It is therefore recommended to scope this assessment in at present.
Potential increases to underwater noise generated by increased vessel movements due to increased capacity at the port.	No	Although its less likely that the effects of increases in shipping due to the port development will be significantly above levels already experienced within Fal Estuary and Falmouth Bay, its likely an assessment will still be required to demonstrate this sufficiently at the EIA stage.

17.4 Approach and Methodology

17.4.1 The ES chapter will include a review the existing underwater noise within the study area. This will include a data and literature review of academic journals, government, non-government organisations and industry reports.

17.4.2 Potential sources of underwater noise emissions will be identified and assessed in the context of the underwater noise environment currently existing within the Fal Estuary and immediate surrounds, and against the potential future baseline for underwater noise for the area.

17.4.3 The assessment will identify the nature of the effects upon on the underwater noise climate to which other marine receptors may be exposed to. As such it will not directly assess the potential impacts from underwater noise on ecological receptors, however, will provide an assessment of the ranges to which impacts to secondary receptors many be expected. As such, regard will be given to the nature and location of other receptors (such as marine mammals and fish) that are sensitive

to underwater noise. These assessments will be provided in Section 9: Marine Ecology, and Section 10: Commercial Finfisheries and Shellfisheries.

17.4.4 The EIA methodology for assigning significant impacts for underwater noise follows the general methodology described in Section 4.

17.4.5 The EU Marine Strategy Framework Directive (MSFD, since transposed into UK law) GES descriptor that relates to underwater noise (Descriptor 11) provides useful criteria to inform the assessment of impacts of the proposed development. Descriptor 11 states "loud, low and mid frequency impulsive sounds and continuous low frequency sounds introduced into the marine environment through human activities are managed to the extent that they do not have adverse effects on marine ecosystems and animals at the population level"[67].

17.4.6 There is still uncertainty regarding what levels and frequencies of man-made marine noise lead to effects at a population and ecosystem level, particularly for vulnerable/threatened species and key functional groups, and how to quantify the risk of impact at these scales[67]. Due to these uncertainties with the MSFD descriptor, the Chapter will consider underwater noise in relation to marine fauna (mammals and fish), treated as 'secondary' receptors. These secondary receptors have significance criteria established based on their sensitivity to changes to underwater sound level.

17.4.7 In order to assess the potential impacts of underwater noise generated during the construction and operation of the proposed development, it is also necessary to understand whether the noise is in a frequency range that can be detected by the marine noise sensitive receptors likely to be present in the vicinity of the proposed development. Where a noise source is detectable, it is then necessary to ascertain the nature of the potential impact resulting from the receptor being exposed to the noise source, as well as the distance to which that impact is likely to be experienced. The sensitivities of secondary receptors are summarised in the sections below.

17.4.8 The noisiest demolition and/ or construction activity for the project will be modelled. This will allow the spatial scale of effect to be determined much more precisely. At present the most noisy activity is envisaged to be the piling activity; however consideration would be needed to determine potential noise levels generated by the removal of rock areas from around the new berth areas. Levels of noise generated will ultimately be determined by the agreed removal methodology.

17.4.9 The underwater noise model will predict the propagation of underwater sound from one or more point sources throughout the water column and for 360º around each sound source. Underwater sound to be assessed for third-octave frequencies of sound across the spectrum from 10 Hz to 25 kHz with outputs from the model presented as 'sound maps' for each frequency showing the transmission loss (TL) or received level (RL) from the source in decibels (dB).

Marine Mammals

17.4.10 Marine mammals hearing sensitivity thresholds will be described more fully in the ES. Marine mammals are divided into four distinct groups based on their known, or assumed, auditory ranges. These are:

- low-frequency cetaceans;
- mid-frequency cetaceans;
- high frequency cetaceans; and

67 Defra (2019). Marine Strategy Part One: UK updated assessment and Good Environmental Status. October 2019.

- pinnipeds.

17.4.11 Sound exposure level (SEL) is used to express the amount of sound over time to which a receptor, such as a marine mammal, is exposed. This can be called the SEL 'dose' or the cumulative SEL (SELcum). The SELcum and peak sound pressure level (SPL) criteria for each mammal functional hearing group are given in Table 17-4 for impulsive sounds. An impact may result in a temporary threshold shift (TTS) where normal detection would return after a length of time dependant on the intensity of the sound and the duration for which an animal was exposed, or the impact can be a permanent threshold shift (PTS) where no recovery is possible. Both TTS and PTS levels are provided for each of the marine mammal hearing groups in Table 17-4.

Table 17-4: Sensitivity Criteria - Weighted Impact Criteria of NOAA (2016) for Marine Mammal Injury from Impulsive Sounds

Hearing Group	TTS threshold (Moderate sensitivity)		PTS threshold (High sensitivity)	
	Peak SPL (dB re 1 µPa)	SELcum (dB re 1 µPa2s)	Peak SPL (dB re 1 µPa)	SELcum (dB re 1 µPa2s)
Low-frequency (LF) cetaceans such as baleen whales	213	168	219	183
Mid-Frequency (MF) Cetaceans such as dolphins, toothed whales, beaked whales, bottlenose whales	224	170	230	185
High-Frequency (HF) Cetaceans such as true porpoises	195	140	202	155
Phocid Pinnipeds in water (PW) such as true seals	212	170	218	185
Otariid Pinnipeds in water (OW) such as sea lions and fur seals	226	140	232	203

Source: Adapted from NOAA (2016)[68]. Peak pressure is rms dB re 1 µPa un-weighted values; SELcum units are dB re 1 µPa^{2}s, weighted for hearing range of the various categories and the SELcum accumulation period is 24 hours.

17.4.12 The sensitivity criteria set out in Table 17-4 will be used as the basis for defining the areas of impact with respect to secondary marine mammal receptors. The sensitivity of marine mammals to underwater impact noise can be considered high.

Fish

17.4.13 Fish hearing sensitivity thresholds will be described in more detail in the ES. Fish hearing thresholds depend greatly on the hearing mechanisms of the species, and can be broadly grouped into three classes. These are:

- fish that do not have a swim bladder or other gas filled chamber;
- fish with a swim bladder that is not involved in hearing; and,

68 NOAA (2016). Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts, National Oceanic and Atmospheric Administration, Technical Memorandum NMFS-OPR-55, July 2016, http://www.nmfs.noaa.gov/pr/publications/techmemos.htm

- fish which have a swim bladder that is linked to the hearing mechanism.

17.4.14 All of these fish groups are likely to be present within the vicinity of the proposed development. A summary of the basic fish groupings and fish sensitivity to noise exposure criteria is provided in Table 17-5. The table provides sound levels, for each of the hearing groups, where impulsive sound may cause mortality, recoverable injury and TTS.

Table 17-5: Sensitivity Criteria - Impact Pile Driving Criteria for Fish as defined by Popper *et al* (2014)[69]

Category	Mortality or potential mortal injury (High sensitivity)	Recoverable injury (Moderate sensitivity)	TTS (Low sensitivity)
Fish without a swim bladder or other gas chamber e.g. dab and other flatfish. These species are more likely to only detect particle motion rather than sound pressure. As they have no gas chambers they are less likely to suffer significant barotrauma	>219 dB SELcum OR >213 dB peak SPL	>216 dB SELcum OR >213 dB peak SPL	>>186 dB SELcum
Fish with swim bladders, or other gas volume, which is not involved in the detection of sound e.g. Atlantic salmon. These species are susceptible to barotrauma although hearing only involves particle motion not sound pressure	210 dB SELcum OR >207 dB peak SPL	203 dB SELcum OR >207 dB peak SPL	>186 dB SELcum
Fish with a swim bladder or other gas volume which is involved in sound detection e.g. Atlantic cod, herring and relatives. These species are susceptible to barotrauma and detect sound pressure as well as particle motion	207 dB SELcum OR >207 dB peak SPL	203 dB SELcum OR >207 dB peak SPL	186 dB SELcum

Notes: Adapted from Popper et al. (2014)[93] Peak and rms sound pressure level dB re 1 µPa; SEL dB re 1 µPa2·s. SELcum = Cumulative sound exposure level accumulated over a 24 hour period assuming stationary animals

17.4.15 The assessment will use sensitivity criteria based on fish species that use swim bladders for hearing in Table 17-5. This is considered a worse case, as these are the most sensitive fish and have slightly lower thresholds for mortality and recoverable injury (the TTS threshold is the same across all hearing groups).

[69] Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol S, Carlson TJ, Coombs S, Ellison WT, Gentry RL, Halvorsen MB, Løkkeborg S, Rogers PH, Southall BL, Zeddies DG, Tavolga WN (2014) ASA S3/SC1.4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSIAccredited Standards Committee S3/SC1 and registered with ANSI. Springer and ASA Press.

Sensitivity to vessel noise and other sounds

17.4.16 To consider the potential effect of continuous noise sources, such as vessel noise on fish, criteria will be used for the most sensitive fish group, where a swim bladder is used in hearing.

17.4.17 Quantitative sensitivity criteria will be applied to recoverable injury and TTS only in Table 17-6. As such, no modelling is proposed for the assessment of vessel noise on ecological receptors.

17.4.18 Qualitative sensitivity criteria will be used for masking and behavioural impacts. Masking occurs when a loud sound drowns out a softer sound or when noise is at the same frequency as a sound signal. This can be important when sound is used in predator avoidance for example. The relative risk of an effect is placed in order of rank at three distances from the source – near (e.g. tens of metres from the source), intermediate (e.g. hundreds of metres from the source), and far (e.g. thousands of metres from the source) (Table 17-7**).**

17.4.19 Overall the sensitivity to vessel noise and other sounds ranges from low to high according to the secondary receptor and type of effect.

Table 17-6: Sensitivity Criteria - Continuous Sounds and Fish

Fish Grouping	Mortality and Potential Mortal Injury	Impairment			
		Recoverable Injury	Temporary Threshold Shift	Masking	Behaviour
Swim bladder is involved in hearing (primarily pressure detection)	Near to Far High Sensitivity	170 dB rms for 48 hrs Moderate Sensitivity	158 dB rms for 12 hrs Low Sensitivity	Near to Far High Sensitivity	Near - High Sensitivity Intermediate – Moderate Sensitivity Far - Low Sensitivity

Source: *Popper et al., 2014* [69]

Notes: *Root mean square (rms) sound pressure levels dB re 1 µPa; SEL dB re 1 µPa2·s. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N; tens of metres from source), intermediate (I; hundreds of metres from source), and far (F; thousands of metres from source).*

Sensitivity and Magnitude

17.4.20 The secondary receptors' sensitivity criteria described above will be used to inform the sensitivity assessment categories for the assessment of the primary receptor of underwater noise environment of the Fal Estuary (see Table 17-7).

17.4.21 The magnitude of effect is likely to be dependent on the level of impact that is being considered. For example what would be considered high magnitude for mortality (1 km) is considered medium magnitude for recoverable injury and low magnitude for TTS. These criteria will be used to inform the magnitude assessment categories for the assessment of the primary receptor of underwater noise environment of the Fal Estuary and are provided in Table 17-7.

Table 17-7: Sensitivity and magnitude criteria for the secondary receptors of underwater noise environment in the Fal Estuary

Fish Grouping / Assessment Criteria	Mortality and Potential Mortal Injury (fish)	Recoverable Injury (fish) and PTS (mammals)	Temporary Threshold Shift (fish and mammals)	Masking and Behaviour (fish)
Sensitivity: Swim bladder is involved in hearing (primarily pressure detection)	Very high	High	Moderate	Low
Magnitude: Swim bladder is involved in hearing (primarily pressure detection)	H – 1 km M – 500 m L – 250 m	H – 2 km M – 1 km L – 500m	H – 8 km M – 4 km L – 2 km	H – 8 km M – 4 km L – 2 km

17.4.22 The sensitivity and magnitude criteria for the assessment of underwater noise environment in the Fal Estuary has been based on the most sensitive secondary receptor of fish with swim bladder involved in hearing, as this is considered a worst case.

Assessment of significance

17.4.23 The significance criteria for the impact on underwater noise of the Fal Estuary uses the significance table that is provided in Appendix 1.

17.5 Preliminary Discussion of Mitigation and Enhancement Measures

17.5.1 There is the potential for significant effects on marine mammals and fish as a result of the demolition and construction works.

17.5.2 Mitigation for piling activities may include some or all of the below.

- gradual ramping-up of sound to scare fish and marine mammals away before sound levels reach lethal levels;
- no pile driving at night, to allow night-time migration of any migratory fish that may use the Fal Estuary;
- non-metallic pad between the hammer and the head of the pile ('pile cushion') which is likely to reduce some of the higher frequency noise, thus reducing impacts to high frequency marine mammals;
- initial driving by a 'silent method' e.g. hydraulic pressing or vibration; and,
- percussive driving for no more than 6 hours per day.

17.5.3 The use of a marine mammal observer (MMO) or the training of a dedicated member for the construction team to act as a marine mammal observer will provide mitigation against more serious harm that may be associated with marine mammals that are close to the works.

17.5.4 Whilst the level of potential impact cannot be determined without first identification of source levels for both piling and removal of rock activities, and after subsequent modelling, if the above methods of mitigation are not deemed sufficient, there is the potential to deploy a big bubble curtain (BBC), double BBC, or similar technology that may effectively provide a reduction in the underwater noise levels created by the works.

17.5.5 Even though the magnitude of underwater noise envisaged from the operational vessel traffic and maintenance dredging are likely to be low, due to the likely high sensitivity of the receptors, these factors are scoped into the assessments. However as the noise generated are not expected to be materially different from those presently occurring within the estuary, mitigation is therefore unlikely to be needed. However this component is still taken forward for assessment as a precaution at this stage, in part, due to the scale of dredging is not yet fully defined.

18. AIR QUALITY

18.1 Introduction

18.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to air quality.

18.1.2 The EIA will include a review the existing air quality within the study area; consider the suitability of the application site for the proposed development; and assesses the impact of the demolition and construction stage and completed development stage on air quality in the surrounding study area. Potential sources of emissions will be identified and assessed in the context of existing air quality and the nature and location of receptors.

18.1.3 The main air pollutants of concern are dust and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}), typically generated during demolition and construction activities and from industrial sources, and nitrogen dioxide (NO_2), PM_{10} and particulate matter with an aerodynamic diameter of less than 2.5 µm ($PM_{2.5}$), typically generated by road traffic and vessel operations.

18.1.4 Whilst sulphur dioxide (SO_2) is emitted from fuel oil burned in vessels, Falmouth Docks is within the North Sea Emissions Control Area (ECA) where the sulphur content of the fuel is limited to less than 0.1%. In addition, the vessel movements are well below the screening level of 5,000 large ship movements per year within Defra Technical Guidance[70] for an assessment of SO_2 concentrations from ports. The impact of SO_2 emissions from vessels is therefore scoped out of the assessment.

18.2 Site Information and Baseline Conditions

18.2.1 The immediate vicinity of the site is a mixture of commercial, recreational and leisure uses. The closest residential properties are located along Bar Terrace, with student accommodation adjacent to Falmouth Docks railway station.

18.2.2 Baseline air quality is likely to be primarily influenced by emissions from local road traffic, including traffic accessing Falmouth Docks, as well as emissions from vessels using Falmouth Docks.

18.2.3 The site is not located within an Air Quality Management Area (AQMA); with the nearest AQMA located approximately 14 km to the northwest of the sits in Redruth. Cornwall Council (CC) undertake monitoring of NO_2 by diffusion tubes at four locations in Falmouth, there is no particulate matter (PM_{10} or $PM_{2.5}$) or SO_2 monitoring in Falmouth (as concentrations are unlikely to breach National Air Quality Strategy Objectives). The latest available NO_2 monitoring data is summarised in Table 18-1.

Table 18-1: NO_2 Monitoring Data (µg/m^3)

ID	Location	Type	2018	2019	2020
FAL1	High St/Webber St Corner	Roadside	17.6	15.8	11.7
FAL2	Swanpool Street	Roadside	14.9	14.9	12.6

70 Local Air Quality Management Technical Guidance (TG22). August 2022. Defra

ID	Location	Type	2018	2019	2020
FAL3	Dracaena Ave/Highfield Road	Roadside	21.3	21.3	16.7
FAL4	Penwerris Terrace	Urban Background	9.0	8.7	6.4

18.2.4 The closest monitoring location to the site is FAL2 and this is approximately 600 m southwest of the site. The monitoring at FAL2 is likely to be influenced by its proximity to the adjacent road, but the data is likely to be representative of the nearest residential receptors to the site along Bar Terrace.

18.2.5 NO_2 concentrations in Falmouth reduced between 2018 and 2020 and in all cases are well below the annual mean National Air Quality Objective of 40 µg/m^3. Background concentrations at FAL4 are lower than roadside concentrations which demonstrates the local impact of road traffic emissions.

18.3 Potential Impacts and Likely Effects

18.3.1 The following sensitive receptors have been identified:

- Passengers arriving and departing on Cruise Ships (short term objectives only);
- Members of the public at recreational and commercial properties near the site (short term objectives only);
- Residential properties to the north of the docks, e.g. properties along Bar Terrace and Bar Road, Student Accommodation and residential properties along Pendennis Rise (long term and short term objectives); and
- Designated ecological sites susceptible to pollutant emissions, Fal and Helford SAC. (The Falmouth Bay to St Austell Bay SPA and the Lower Fal and Helford Intertidal SSSI do not contain features that are susceptible to atmospheric pollution).

18.3.2 A detailed understanding of the receptors that may be affected will be undertaken through a review of available mapping and other databases. This will be developed once the development traffic flows and spatial extent of the study area has been determined. The study area will be chosen in accordance with the relevant guidance referenced above.

18.3.3 Receptors will include human health (residential receptors and vulnerable receptor groups such as schools, care homes and hospitals), designated sites of ecological conservation importance that are vulnerable to pollutant emissions and any other qualifying features that meet Defra's interpretation of the Air Quality Directive, which include public access (e.g., footpaths). When identifying road traffic sensitive receptors, particular attention will be paid to assessing impacts close to junctions, where traffic may become congested, and where there is a combined effect of several road links.

18.3.4 Table 18-2 and Table 18-3 present a summary of the scoping process, identifying which likely environmental effects, with respect to air quality will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 18-2: Potential Demolition and Construction Stage Effects

Potential Impact	To be Assessed in the EIA (Yes/No)	Reason
Dust deposition and elevated PM_{10} concentrations	Yes	Risk of dust impacts assessed to identify appropriate level of mitigation to employ
Significant increase NO_2, PM_{10} and $PM_{2.5}$ concentrations from road traffic and vessel emissions	Yes	Increase in pollutant concentrations at human health receptors could have a significant effect
Significant increase in NO_x concentrations leading to nitrogen and acid deposition	Yes	Increase in pollutant concentrations and deposition at designated ecological site could have a significant effect
Increase in odour from dredging	Yes	Potential for significant odour effects at nearby residential, commercial and recreational receptors.

Table 18-3: Potential Completed Development Stage Effects

Potential Impact	To be Assessed in the EIA (Yes/No)	Reason
Significant increase NO_2, PM_{10} and $PM_{2.5}$ concentrations from road traffic and vessel emissions	Yes	Increase in pollutant concentrations at human health receptors could have a significant effect
Significant increase in NO_x concentrations leading to nitrogen and acid deposition	Yes	Increase in pollutant concentrations and deposition at designated ecological site could have a significant effect

18.4 Approach and Methodology

18.4.1 For the proposed development site, only the short-term objectives apply (1-hour mean NO_2 and 24-hour mean PM_{10}) as the proposed development does not involve long-term exposure, such as residential uses.

18.4.2 The potential impacts of dust during the demolition and construction stage will be assessed with reference to the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction'[71]. The methodology is a risk assessment to identify the level of risk of adverse dust impacts, with appropriate mitigation selected on the basis of the identified level of risk. In accordance with this guidance, no assessment of the significance of effects is made without mitigation in place as mitigation is presumed to be in place by means of appropriately worded planning conditions. With mitigation in place, construction phase dust effects are assessed as not significant.

18.4.3 Air quality impacts arising from road traffic and vessel emissions (during both the demolition and construction and completed development stages) will be assessed with reference to guidance issued by the IAQM 'Land-Use Planning & Development Control: Planning for Air Quality'[72]. The significance criteria within the guidance will be used to assess the significance of impacts at individual receptor locations. In accordance with the guidance, the overall air quality effect will be

71 Holman, et al., 2014. Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction. IAQM: London
[72] Moorcroft and Barrowcliffe. et al., 2017. Land-use Planning & Development Control: Planning for Air Quality. v1.2. IAQM: London

assessed as either significant or not significant taking into account the predicted magnitude of change, the total pollutant concentrations and number of receptors affected.

18.4.4 The indicative criteria for requiring an air quality assessment for road traffic emissions is:

- A change in Light Duty Vehicles (LDV) flows of more than 500 Annual average Daily Traffic (AADT); and
- A change in Heavy Duty Vehicles (HDV) flows of more than 100 AADT.

18.4.5 The above criteria are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. The criteria are precautionary and should be treated as indicative, based on the local baseline and professional judgement it may be appropriate to amend them where it is unlikely that a significant effect on local air quality would occur.

18.4.6 If road traffic from a development significantly exceeds the above criteria and there are receptors likely to be impacted by road traffic emissions, the assessment of operational road traffic impacts would be undertaken using the Atmospheric Dispersion Modelling System (ADMS) roads detailed dispersion model. The modelling will make use of mapped background concentration data provided by Defra, traffic flow projections and verified against local air quality monitoring data.

18.4.7 The impact of vessel emissions will be assessed by using the ADMS roads detailed dispersion model.

18.4.8 The impacts of odour emissions from dredging during the demolition and construction stage will be qualitatively assessed using guidance issued by the IAQM 'Guidance on the assessment of odour for planning'[73]. The overall effect will be judged as either significant or not significant.

18.5 Preliminary Discussion of Mitigation and Enhancement Measures

18.5.1 Best practice mitigation measures to reduce effects from construction dust, such as the use of hoarding and dust suppression techniques, will be included in a CEMP to ensure that construction dust does not result in a significant effect.

18.5.2 Significant effects are not anticipated from operational road traffic and vessel emissions given the location of the site and baseline air quality in the area; however, mitigation measures may be proposed to reduce the impacts.

73 Bull *et al*., 2018. IAQM Guidance on the assessment of odour for planning – version 1.1, Institute of Air Quality Management, London

19. CLIMATE CHANGE

19.1 Introduction

19.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to climate change.

19.1.2 The EIA Regulations require an assessment of the likely significant effects of a project on climate and vice versa. A climate assessment in the context of EIA comprises of three separate assessments:

- Climate Change Resilience (CCR) Assessment – considers the vulnerability of the proposed development to extreme weather and projected climate change;
- In-combination Climate Impacts (ICCI) Assessment – considers how extreme weather and projected climate change could have an additive effect on impacts identified by other technical disciplines as a result of the proposed development; and
- Greenhouse Gases (GHG) Assessment – considers the potential for significant effects to arise from the proposed development in terms of greenhouse gas emissions.

19.2 Site Information and Baseline Conditions

Current Climate and GHG Emissions Baseline

19.2.1 A local climate baseline is provided by Met Office Historic Climate Data57[74] which presents a set of 30- year averages, covering the period 1981-2010 for a range of parameters and locations. The nearest Met Office data station to the site is Camborne, which is located approximately 19 miles to the northwest of the site.

19.2.2 Additionally, a climate baseline is provided by Met Office Historic Climate Data[75] which presents a set of 30-year averages, covering the period 1981 to 2010 for a range of parameters and locations. The most recent baseline period is between 1981 and 2010 which is the basis for calculating the anomalies (for 25 km) from the UKCP18 dataset. Baseline data is available for 2020 however, this would not align with the anomaly projections preventing a fair comparison.

19.2.3 The Met Office uses districts when generating climate data for the UK. The scheme is located within Cornwall, in the South-West of England. This region comprises counties such as Cornwall, Devon and Somerset together with the four administrative areas around Bristol (formerly Avon) and the Isles of Scilly. The climate observations for the South-West of England are summarised in Table 19-1.

Table 19-1: High level climate observations for the South-West of England (1981-2010)

Climate Conditions	Climate Observations
Temperature	Mean minimum temperatures between 1-2°C in winter and mean maximum temperatures between 19-21.5°C in summer.
Rainfall	Annual rainfall averages between 800-900mm, with less rainfall occurring in the Somerset area (700 mm). Monthly rainfall is variable but is highest in winter months. The number of days with rainfall greater than 1mm in the Somerset

74 Met Office, 2020. Southampton Historic station data [online] Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/historic-station-data [Accessed 29/09/2022]
75 Mett Office, 2016. South West England: Climate https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/south-west-england_-climate---met-office.pdf

Climate Conditions	Climate Observations
	area are 12-13 days in winter months, dropping to an average of seven - nine days in summer.
Wind	South-West England is one of the more exposed areas of the UK. The strongest winds are associated with the passage of deep depressions close to or across the British Isles. The frequency and strength of these depressions is greatest during the winter, when mean speeds and gusts are strongest at approximately 80 knots.
Sunshine	Average annual sunshine totals are between 1,450 – 1,600 hours, with the coastal areas in the South-West receiving more sunshine than inland areas.
Air Frost	The average number of days with air frost varies between 35 – 60 days per year.

19.2.4 The proposed development includes the redevelopment and modernisation of facilities at Falmouth Docks. The estimated GHG emissions associated with the existing facilities within the redline boundary will be presented within the ES.

19.2.5 Local and Regional GHG emissions data tables published by the Government contain historic emissions data covering 2007 to 2017 for all the UK's local authorities and councils[76]. The total emissions in the South-West (including Cornwall) are generally lower than other regions across the UK; however, per capita emissions are generally the same (18 tCO_2e per capita in the South-West compared to 17 tCO_2e per capita in England and 18 tCO_2e per capita in the UK).

19.2.6 Across the UK, regions are following the same trend of decreasing GHG emissions over the past decade due to factors such as a decrease in the use of coal for electricity generation. Specifically, in Cornwall, total GHG emissions reduced from 3,850 tCO_2e in 2018 to 3,407 tCO_2e in 2020, a reduction of approximately 11.5% across three years. Annual per capita emissions have reduced from 6.8 tCO_2e in 2018 to 5.9 tCO_2e in 2020.

Future Climate Baseline

19.2.7 Whilst scientific data shows that the climate is changing, there remain uncertainties in terms of the magnitude, frequency and spatial distribution of these changing conditions.

19.2.8 To determine the likely future conditions at the site, there is a need to apply climate projections to understand what local conditions are likely to be present during the lifetime of the proposed development. Good practice in the UK uses the United Kingdom Climate Projections 2018 (UKCP18)[77] projections which are generated from climate modelling. Different emissions scenarios can be applied, with more extreme changes occurring at higher emission scenarios.

19.2.9 The general climate trends for the UK are described below, summarised from UKCP18 projections. A qualitative future baseline for the South-West of England (which includes Cornwall) will be presented within the ES. Generally, trends become more pronounced over time with more extreme trends arising by 2080:

- Increase in mean, maximum and minimum daily temperatures across all seasons;

[76] UK Government, 2022. UK local authority and regional GHG emissions national statistics 2005-2020 [online]. Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2020 [Accessed 29/09/2022]

[77] Met Office, 2018. UK Climate Projections [online]. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index [Accessed 29/09/2022]

- Hotter and drier conditions in summer – increase in mean, maximum and minimum daily temperatures and decreased precipitation in summer;
- Warmer and wetter conditions in winter – increase in mean, maximum and minimum daily temperatures and increased precipitation in winter;
- Increased frequency of extreme weather events (e.g. dry spells/drought, heavy rainfall events, heatwaves);
- Decreased frequency of cold weather events – decrease in the number of snow and frost days, however extreme cold snaps can still occur;
- Increased frequency of windstorm events in the latter half of the 21st Century – increased average wind speeds and increases in extreme winds; and
- Decrease in relative humidity.

19.2.10 In the absence of the proposed development, the GHG emissions from the site are not anticipated to change compared to the existing baseline which will be presented within the ES.

19.2.11 Local and national GHG emissions have been reducing over recent years, primarily due to increasing generation of electricity from sources that produce less GHG emissions. This trend is expected to continue especially given the recent UK commitment to reduce domestic emissions to net zero by 2050. It is expected that emissions/ carbon intensity will continue to decline in the region due to a combination of the following factors:

- National Government carbon budget;
- Local carbon reduction targets;
- Low carbon building design; and
- Decarbonisation of industry, energy supply and transportation.

19.3 Potential Impacts and Likely Effects

19.3.1 The following sensitive receptors have been identified:

- Construction workers for the proposed development;
- Construction activities e.g. materials, programme, cost;
- People in the immediate surroundings of the proposed development footprint;
- The proposed development (e.g. integrity of landscape features and buildings/occupants of the development) during the operational stage; and
- The global atmosphere due to emissions of greenhouse gases associated with the proposed development during construction and operation.

19.3.2 In summary, the following potential impacts have been identified:

- Release of GHG emissions in the atmosphere as a result of the demolition, construction and completed development stages of the proposed development;
- Intense rainfall events during demolition and construction that could lead to flooding and obstructions to access roads;
- Wind gusts that could damage construction materials such as earthworks and stockpiles;
- Unsuitable conditions (terrestrial and marine) for demolition and construction activities such as pouring concrete and piling causing programme delays and increased costs;
- Impacts on the health and safety of site personnel during severe weather events such as risk of heat stress; and

- Storm surges causing flooding of the proposed development during the completed development stage.

19.3.3 Table 19-2 and Table 19-3 present a summary of the scoping process, identifying which likely environmental effects, with respect to climate change, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 19-2: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Resilience of the demolition and construction activities to climate and climate change impacts.	No	Extreme weather has the potential to impact the demolition and construction stage of the proposed development. For example, heat stress as a result of extreme heat events could lead to unsafe working conditions. The short-term and imminent nature of the demolition and construction stage means that the climate conditions experienced currently are likely to be similar to those experienced during demolition and construction. In addition, the existing health and safety protocols in place for working conditions are sufficient to manage these risks. The Institute of Environmental Management and Assessment (IEMA) EIA Guide to: Climate Change Resilience and Adaptation includes the following guidance with regards to EIA scoping of climate change resilience: *"In order to complete Scoping of the EIA, agreement with key stakeholders on the most appropriate climate change projection is required to adopt for the assessment and any necessary methodological considerations to ensure climate change is appropriately considered. This may include the exclusion of explicit consideration of climate adaptation and resilience issues if it is agreed that existing design codes or standard assessment methodologies contain adequate in-built consideration of adaptation and resilience issues"* The CCR assessment has been scoped out on the grounds that it will be considered within the other relevant ES chapters or standalone documents. These include, but are not limited to, the following: • Construction Environmental Management Plan (CEMP) • Flood Risk Assessment (FRA) • Landscape Strategy • Air Quality Assessment • Contamination Assessment
Additive effect that climate and climate change may have on impacts identified by other technical disciplines during the demolition and construction stage	No	Extreme weather has the potential to exacerbate impacts already identified within other technical disciplines. For example, drought conditions could increase the production of dust during demolition and construction, affecting local air quality. However, the nature of the construction effects identified are not considered to cause additional significant effects with regards to additive effects.
GHG emissions associated with demolition of the existing structures onsite and construction of the proposed	Yes	GHG emissions from the proposed development will be emitted to the global atmosphere and contribute to climate change. GHG emissions would be emitted by the following activities: • Extraction, processing and manufacturing of building materials used in the demolition and construction works (embodied carbon);

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
development. This includes emissions from plant types, demolition and construction transport emissions and emissions from the disposal of waste arisings.		• Transport of materials to and from site; • Demolition and construction activities from plant and equipment; and • Disposal of waste from excavation works, notably from dredge arisings. Along with any other wastes generated during the demolition and construction process.

Table 19-3: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Resilience of the proposed development to climate and climate change impacts	No	Climate change has the potential to affect the resilience of the proposed development. For example, more frequent storms and high winds may cause damage to port infrastructure. The proposed development is considered to be resilient to storms through the implementation of design standards with an inclusion of climate change allowances that accommodate for greater storm events in the future. Strong winds associated with storm events will be factored into the design of the proposed development in respect of structural integrity and appropriateness of any above deck features. The Institute of Environmental Management and Assessment (IEMA) EIA Guide to: Climate Change Resilience and Adaptation includes the following guidance with regards to EIA scoping of climate change resilience: *"In order to complete Scoping of the EIA, agreement with key stakeholders on the most appropriate climate change projection is required to adopt for the assessment and any necessary methodological considerations to ensure climate change is appropriately considered. This may include the exclusion of explicit consideration of climate adaptation and resilience issues if it is agreed that existing design codes or standard assessment methodologies contain adequate in-built consideration of adaptation and resilience issues"* The CCR assessment has been scoped out on the grounds that it will be considered within the other relevant ES chapters or standalone documents and climate change will be considered within the design. These include, but are not limited to, the following: • Construction Environmental Management Plan (CEMP) • Flood Risk Assessment (FRA) • Landscape Strategy • Air Quality Assessment • Contamination Assessment
Additive effect that climate and climate change may have on impacts identified by other technical disciplines as a result	Yes	Climate change has the potential to exacerbate impacts already identified within other technical disciplines. For example, storm surges could lead to severance of facilities and/or power outages and damage on site.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
of the proposed development.		
GHG emissions associated with the operation of the proposed development. This includes emissions from unregulated energy demands (including plug-in systems, ventilation, air conditioning and lighting) and regulated energy demands, including heating, cooling, domestic hot water, auxiliary power and lighting.	Yes	GHG emissions from the proposed development will be emitted to the global atmosphere and contribute to climate change. GHG emissions would be emitted as a result of regulated and unregulated energy demand during operation.

19.4 Approach and Methodology

ICCI Assessment

19.4.1 To assess the direct and indirect significant effects of climate relevant to the proposed development, the additive impacts of climate change to those effects identified in the other relevant ES chapters will be considered. Effects originally identified in other ES chapters but considered not significant may have to be reconsidered and could require additional design and/or mitigation measures should there be an additive effect as a result of climate change.

19.4.2 Future climate conditions will be reviewed as part of this assessment, including changes to long term seasonal averages and extreme weather events as projected by the UKCP18.

GHG Assessment

19.4.3 The study area for this assessment includes emissions arising from demolition, construction and operational activities within the redline boundary of the site, emissions arising from the transport network utilised for transport and disposal of materials and embodied carbon associated with the relevant construction materials. The GHG assessment will include:

- A review of current and future GHG trends;
- A proportionate calculation of GHG emissions from the demolition and construction processes utilising PAS 2080:201662[78]. PAS 2080 provides a framework on how to manage whole life carbon when delivering infrastructure assets and programmes of work and considers emissions associated with: extraction, processing and manufacturing of building materials used in construction (embodied carbon); transport of materials to and from site; construction activities from plant types and disposal of waste from excavation works and construction;
- A proportionate calculation of GHG emissions from the operation of the development utilising PAS2080 which considers emissions associated with regulated and unregulated energy demand;

78 BSI, 2016. PAS2080 Carbon management in infrastructure, online. Available at: https://shop.bsigroup.com/ProductDetail?pid=000000000030323493 [Accessed 29/09/2022]

- A comparison of the scenario without proposed development against the scenario with the proposed development and the UK carbon budgets; and
- A summary of design and mitigation measures for the proposed development.

19.4.4 The conclusion of the GHG assessment will be to provide a qualitative judgement on whether GHG emissions associated with the development are considered to be significant.

19.5 Preliminary Discussion of Mitigation and Enhancement Measures

19.5.1 The ES will identify any necessary mitigation measures, dependent on the outcome of the climate change assessment, such as:

- Design and mitigation measures required to address any identified significant adverse effects;
- A Construction Environmental Management Plan (CEMP) and Materials Management Plan (MMP) to reduce waste generation; and
- Estimation of the carbon footprint for the proposed development and consideration of carbon reduction opportunities within the design process.

20. MATERIAL RESOURCES AND WASTE

20.1 Introduction

20.1.1 This section summarises the potential environmental impacts and likely significant effects that are at this stage anticipated to arise in connection with all stages of the proposed development for material resources and waste and will therefore be addressed in the subsequent ES. Environmental effects that are considered not likely to be significant are also summarised in this section and will not be addressed in the subsequent ES.

20.2 Site Information and Baseline Conditions

20.2.1 In line with IEMA guidance[79] the study area for the Proposed Development will be the Southwest of England for materials (nationally for steel) and the Southwest of England for waste.

20.2.2 The baseline has been established through a desk-based review of regional and national data, based on the IEMA guidance, from the following sources:

- Environment Agency, 2021[80]
- The Mineral Products Association's Profile of the UK Mineral Products Industry 2020[81]
- National Association of Steel Service Centres Annual Report 2018-2019 – Appendix V, Domestic Supply[82]

Waste

20.2.3 Key anticipated waste streams arising from the landside construction and demolition would mainly be comprised of crushed concrete, brick, and timber.

20.2.4 Marine sediments within the vicinity of the port infrastructure are anticipated to be sands, gravels and finer sediments that are likely to be contaminated. For further detail refer Section 6: Marine Sediment Quality and Water Quality.

20.2.5 Dredged arisings will be produced as part of the development. It is likely that they will be managed via offshore disposal under a licence issued by the Marine Management Organisation and on land at a suitably permitted facility.

20.2.6 Operational waste would be a mixture of commercial and industrial waste streams due to the nature of the proposed development. The site maintains a private contract with Biffa for day-to-day commercial waste generated from the site. Cornwall Council has produced a Resources and Waste Strategy for the wider area, for the period 2018-2030.

20.2.7 The Environment Agency Waste Data Interrogator is interpreted by the Environment Agency itself to provide estimated landfill void capacity.

Landfill Type	Void Capacity / m3
Inert and non-hazardous	25,570,506
Hazardous	1,238,752

[79] IEMA guide to: Materials and Waste in Environmental Impact Assessment - Guidance for a proportionate approach. March 2020
[80] 2021 Remaining Landfill Capacity (data.gov.uk)
[81] Mineral Products Association, 2020, Profile of the UK Mineral Products Industry: https://www.mineralproducts.org/MPA/media/root/Publications/2021/Profile_of_the_UK_Mineral_Products_Industry_2020_Spread.pdf
[82] National Association of Steel Service Centres, 2019. Annual Report 2018-2019. https://nass.org.uk/Publications/Publication4536/Annual%20Report%202018-2019.pdf

20.2.8 summarises this information in Southwest England for 2021, which is the most recent year data is available.

Table 20-1: Landfill Void Capacity

Landfill Type	Void Capacity / m^3
Inert and non-hazardous	25,570,506
Hazardous	1,238,752

Materials

20.2.9 The regional (Southwest) and national sales of primary (not recycled) materials are summarised in Table 20-2. Regional data is only available for aggregate and concrete.

20.2.10 Materials identified in the table are based on the main construction materials estimated to be required for the Proposed Development's construction.

20.2.11 Given that the number, type, and size of construction developments varies from year to year, the demand for materials also fluctuates. As such, this data should be considered representative.

Table 20-2: Primary Materials Baseline

Primary Materials	Regional Baseline (tonnes)	National Baseline (tonnes)
Aggregate	30,100,000	
Concrete	3,120,000*	
Steel		4,200,000
*Converted from 1,300,000 m^3 using density of 1/2.4 tonnes		

20.3 Potential Impacts and Likely Effects

20.3.1 The following sensitive receptors have been identified:

- Landfill void capacity
- Materials markets
- Offshore disposal location/s

20.3.2 Table 20-3 and Table 20-4 present a summary of the scoping process, identifying which likely environmental effects, with respect to material resources and waste, will be assessed in the EIA (i.e. considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e. 'scoped out'), along with a justification for this decision.

Table 20-3: Potential Demolition and Construction Stage Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Consumption of resources	No	The design will be developed to minimise use of resources and following established sustainability principles. Materials anticipated to be required are likely to be readily available including from secondary recycled sources. Where possible demolition and excavation arisings will be re-used within the development.
Depletion of Landfill void	Yes	Waste will be generated during the demolition and construction stages and via the dredging process.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		There is potential for hazardous waste to be produced.
Offshore disposal location/s	No	Offshore disposal of dredged arisings will be managed under a licence from the Marine Management Organisation which will be bespoke to the disposal activity and will consider all related impacts. Any dredged arisings not disposed of offshore will be managed via a suitably permitted facility on land, the effects on which are considered above.

Table 20-4: Potential Completed Development Stage Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Consumption of resources	No	Resources will be consumed by operations at the development, but these are not considered to be significant.
Generation of waste during operation	No	Operational waste would be a mixture of commercial and industrial waste streams due to the nature of the proposed development but is not considered to increase significantly from the existing baseline. These wastes would be managed by the existing waste infrastructure and only residual wastes would be disposed of at landfill.
Generation of dredge arisings during operation	No	The requirement for maintenance dredging has not yet been defined, however it is not considered likely that the volumes requiring disposal would have a significant impact on available landfill void.

20.4 Approach and Methodology

20.4.1 IEMA guide to: Materials and Waste in Environmental Impact Assessment - Guidance for a proportionate approach, March 2020 will be used in the ES chapter for the assessment of scoped in effects.

20.4.2 The following tasks will be carried out to determine the impact from the generation of waste and use of material resources from the Proposed Development:

- Review of relevant legislation, national and regional and local planning policies and guidance to identify waste management and material resource objectives and targets.
- Review of the design and data from the client to estimate the quantities and types of material resources to be used and wastes to be generated during construction and operation.
- Identify and evaluate the impacts of the Proposed Development against baselines for material resources and waste.
- Identify opportunities/mitigation measures to reduce, re-use, recover and/ or recycle material resources and wastes through a review of the Proposed Development's design.

20.4.3 An assessment of the level of environmental effect from the generation of waste and use of material resources will be made using the criteria detailed in Appendix 4G, which are set out in the IEMA guidance.

20.5 Preliminary Discussion of Mitigation and Enhancement Measures

20.5.1 The ES will identify any necessary mitigation measures and/or enhancement measures, dependent on the outcome of the materials resources and waste assessment. Potential mitigation measures may include:

- Site waste management plan,
- Materials management plan,
- The specification of recycled aggregates as appropriate, and
- An operational waste management plan.

21. LANDSCAPE, SEASCAPE AND VISUAL AMENITY

21.1 Introduction

21.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to landscape, seascape, and visual amenity.

21.1.2 The Guidelines for Landscape and Visual Impact Assessment (GLVIA)[83] provides the following definitions:

- Landscape: *An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.*
- Seascape: *Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.*
- Visual amenity: *The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living working, recreating, visiting or travelling through and area.*

21.2 Site Information and Baseline Conditions

21.2.1 An overview of the landscape, seascape and visual baseline context of the site is provided below and supplemented by information in Appendix 4H.

21.2.2 The following reference sources have been used:

- Ordnance Survey Mapping;
- Google Earth;
- National Character Area (NCA) Profile 152[84];
- Cornwall Area of Outstanding Natural Beauty (AONB) website[85];
- Cornwall And Isles of Scilly Landscape Character Study[86];
- Falmouth character area sheets[87];
- Local map from the Falmouth Town Council website[88];
- Cornwall Council Tree Preservation Orders[89];
- Cornwall Council Conservation Areas[90];
- Falmouth Conservation Area Appraisal[91];
- Cornwall Council public rights of way[92]; and
- South West Seascape Character Assessment Report[93].

[83] Guidelines for Landscape and Visual Impact Assessment, Landscape Institute and Institute of Environmental Management & Assessment, Third Edition, 2013
[84] http://publications.naturalengland.org.uk/publication/6654414139949056 [Accessed 15/09/2022]
[85] https://www.cornwall-aonb.gov.uk/ [Accessed 15/09/2022]
[86] https://map.cornwall.gov.uk/reports_landscape_chr/areaCA13.pdf [Accessed 15/09/2022]
[87] https://www.cornwall.gov.uk/media/yfwmmukp/falmouth-character-area-sheets.pdf [Accessed 15/09/2022]
[88] http://falmouthbids.s3.amazonaws.com/fal0049001_falmouth_map_2015_d600921ff9a601e2.pdf [Accessed 02/08/2022]
[89] https://www.data.gov.uk/dataset/445e196c-a577-4d69-9c7f-a4a6925b8a88/tree-preservation-orders-points / https://www.data.gov.uk/dataset/09fed522-0ac9-4fa7-8234-999c224c2758/tree-preservation-orders-polygons [Accessed 16/09/2022]
[90] https://www.data.gov.uk/dataset/f4269771-fc24-4332-97e1-47852580fbf1/conservation-areas [Accessed 16/09/202]
[91] https://map.cornwall.gov.uk/reports_conservation_areas/Falmouth%20-1989.pdf [Accessed 16/09/2022]
[92] https://www.rowmaps.com/datasets/CN/ [Accessed 16/09/2022]
[93] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/750228/South_West_-_Seascape_character_assessment_report.pdf [Accessed 16/09/2022]

Landscape and Seascape

National Landscape Character

21.2.3 The Site is located towards the southwest of NCA 152, Cornish Killas. The NCA forms the main body of the Cornish landmass around the granite outcrops of Bodmin Moor, Hensbarrow, Carnmenellis, West Penwith and The Lizard NCAs.

21.2.4 Characteristics and experiential qualities of the NCA include:

- Coastal defences and 16th century Henrician forts along the south coast, with clustering around Falmouth and the Fal, St Austell Bay and Whitsand Bay towards Plymouth.
- Coastal towns such as Falmouth, Fowey and Padstow, established on a strong maritime industry.
- Most tranquil areas along the less developed stretches of coastline such as the Roseland peninsula and Port Isaac Bay.
- Least tranquil areas are around the larger towns of Truro, St Austell, Falmouth and Padstow.

Regional Landscape Character

21.2.5 The site is located within landscape character area CA13, Fal Ria, Truro and Falmouth, of the Cornwall And Isles of Scilly Landscape Character Study. It includes the area around Falmouth and Truro and west towards Shortlanesend and Threemilstone, the Tresillian and Percuil river systems, and the coastal margin of the Roseland peninsula to Portscatho. It is described as being strongly influenced by the Fal Ria, which comprises a series of interlocking tributary creeks flowing into the River Fal which widens out into a large estuary and deep water harbour.

21.2.6 The western side of the ria is much more developed than the eastern side and much more urban with Falmouth and Penryn close to the estuary, and Truro at the uppermost navigable point. Road, rail and river transport links in between these settlements, docks, shipping and industrial and waterfront development give the western side of this character area a very busy feel which is far from tranquil, except in the more isolated creeks. In contrast, on the eastern side of the ria, pretty villages many with medieval churches nestle at the heads of tranquil creeks and largely retain their historic scale and layout.

Landscape Designations

21.2.7 The site is located less than 500m to the south of the South Coast Central[94] Section of the Cornwall AONB, which encompasses the rural landscape across the estuary to the north and east. The AONB website states that this AONB Section *"embraces the Fal Ria; including Mylor, Feock and the Roseland Coast to Porthpean. A winding network of intertwining creeks and river valleys is set amongst a landscape of steep-sided, twisting valleys. Low rocky cliffs and headlands shelter sandy beaches. There are many distinctive landmarks and subtle historic remains, including castles at St. Mawes and its counterpart at Pendennis Castle, as well as St. Anthony's lighthouse."*

21.2.8 The special qualities of the South Coast Central Section include:

- The main river channel;
- The mouth of the estuary flanked by historic landmarks of St Mawes Castle to the east and Pendennis Castle to the West;
- Large and sinous creeks;

[94] https://www.cornwall-aonb.gov.uk/southcoastcentral [Accessed 15/09/2022]

- Large fields of pasture and arable land extending down to the shoreline;
- Medium-scale field pattern on rounded ridges between the creeks;
- Mature and dense Sessile Oak woodland covering slopes;
- A mix of pastoral and extensive arable uses giving seasonal changes in colour;
- Cornish hedges some of which display their construction in bare stone faces.

21.2.9 There are no tree preservation orders within the site or its immediate vicinity.

21.2.10 The Falmouth Conservation Area is located approximately 800 m away from the site, across open water. As the Falmouth Conservation Area is larger than, and encompasses, the Falmouth townscape character areas, the description of its character is referenced there in further detail.

21.2.11 The Falmouth Conservation Area Appraisal states that "the views looking out of the town are rivalled by those looking towards the town, including of course those from the waters of the estuary or from the open sea. The appearance of the historic core of Falmouth seems smaller than its actual considerable physical scale by the way that it fits its immediate landscape and also by the way that this integrates with its wider landscape. This is because the waterfront and the neck of the peninsula as far as Berkeley Vale was largely developed by the end of the nineteenth century so that the more interesting historic parts of the town relate more visually to their maritime landscape, whereas the very extensive later and generally less visually pleasing development folds over the brow of the hill, or is hidden by hollows in the topography."

Falmouth Townscape Character

21.2.12 The Falmouth character area sheets identify six character areas within 1 km of the site.

- Character area 1, Main commercial axis (approximately 600 m from the site at the closest point), is *"an area of memorably high-quality townscape making up Falmouth's primary retail and commercial focus. It incorporates the oldest portions of the town and its distinctive form – a series of narrow streets on varying alignments connecting end-to-end and strongly enclosed by tall, predominantly historic buildings – has a unique interest and charm."*
- Character area 2, The Moor (approximately 900 m from the site at the closest point), is *"Falmouth's busy civic centre and former market area, with a cluster of large historic institutional buildings around an extensive open public space. With the adjacent streets it forms an important urban focus and a key entrance to the town."*
- Character area 3, The waterfront (approximately 300 m from the site at the closest point), where *"historic topography and fabric form a striking and distinctive area of townscape, both from land and water. Large-scale modern developments are visually prominent but the area is particularly notable for the fine grain, diversity and charm of its historic components."*
- Character area 4, The cliff (approximately 700 m from the site at the closest point), *"represents secondary expansion from Falmouth's historic core. It has an intriguing topography, some good historic fabric and much evidence of past activity. However, there has been extensive removal of historic structures and much of the area now appears as badly degraded townscape, with an air of neglect and absence of care in the treatment of spaces, the public realm and the design of modern components."*
- Character area 5, The terraced suburbs (approximately 1,000 m from the site at the closest point), is *"A large area of terraced suburbs of varying social status in a grid of streets on the higher ground around the historic core of the town. Stucco is the dominant finish, but there is*

wide diversity in form and detail and the high degree of variation within the area is a significant element of its character."

- Character area 6, Seaside resort and wooded suburbs (approximately 100 m from the site at the closest point), described as *"a polite green suburban and seaside area covering much of Falmouth's southern extent. Its character originates from a scatter of large 18th and 19th century houses and their wooded grounds, sited to take advantage of the wide views. Larger buildings and gardens continue to be dominant, despite greater density of visitor accommodation and housing in later expansion."*

21.2.13 The site is not located within any of these townscape character areas, however it is located in the vicinity of character areas 3 (the site is located to the east) and character area 6 (the site is located to the north).

Seascape Character

21.2.14 The site is located within Marine Character Area (MCA) 49: South Cornwall Coastal Waters and Estuaries which encompasses several bays and estuaries along the South Cornwall coast from Manacle Point to Rame Head.

21.2.15 The South West Seascape Character Assessment describes it as "backed by a varied coastline, from intimate rias enclosed by woodland to wide and exposed sandy bays. The waters within the MCA are generally sheltered from the prevailing Atlantic conditions and the sea and its harbours support a great number of boats and ships from large trading vessels to small fishing and recreational boats and yachts. Despite the relatively calm conditions, large volumes of historical shipping and hazards including tidal races and partly submerged rocks have resulted in many wrecks including some which are now popular sites for diving. Important areas for biodiversity are found in the estuaries and in offshore areas, including valued intertidal rock, seagrass, and sandbank and mudflat habitats. These waters were an important defensive location in the past, with the impressive form of Pendennis Castle at Falmouth playing a key role in defending against the threat of the Spanish Armada and in many conflicts since. The settlements along this stretch of coast are steeped in maritime history, with a long past of trade, fishing and smuggling. The warm and mild weather conditions coupled with the picturesque bays and beaches make this area an attractive holiday destination, with tourism now forming an integral part of the economy, along with emerging industries such as marine renewable energy and traditional fishing activity."

21.2.16 Relevant key characteristics include:

- Naval and shipping use and heritage. Falmouth Docks include substantial ship repair facilities used for refitting civilian and naval vessels. Falmouth waterfront houses part of the National Maritime Museum, and site of numerous maritime festivals including tall ships regattas;
- Commercial boats continue to work the harbours at Fowey and Falmouth, including large-scale china clay ships and cruise liners docking at Falmouth. Local ferries add to local character. Large ships on Falmouth Roads, waiting to enter the harbour are a feature of the seascape;
- Recreational activities including sailing (with a large marina at Falmouth and safe moorings in many harbours); fishing, diving, water-skiing and surfing, and popular wildlife watching trips.
- Marked contrast between the well-sheltered areas of the all-weather harbours at Helford River, Falmouth and Fowey and changeable and exposed conditions offshore and around rocky headlands;
- Forming part of the wider seascape setting to the Cornwall AONB and sections of Heritage Coast; and

- Perceptual qualities vary significantly from the busy coastal ports and harbours to long sections of undeveloped coast and the quiet backwaters of the rias.

Visual Amenity

21.2.17 Initial desk-top analysis of potential visibility of the site from the wider landscape, alongside identification of locations for potentially sensitive visual receptors (residents, users of public rights of way and open spaces, recreation areas, and specific viewpoints), has been undertaken and 12 representative viewpoints have been identified (locations are presented in Appendix 4H):

- VP-01: Castle Drive Viewing Platform (identified as a viewpoint on the local map from the Falmouth Town Council website) on South West Coast Path;
- VP-02: National Maritime Museum Cornwall/ Events Square (identified as a viewpoint on the local map from the Falmouth Town Council website). Representative viewpoint of users in the waterfront vicinity;
- VP-03: Public open space on Wodehouse Terrace. Representative viewpoint of properties on higher ground with views to the north and east, and users of the public open space;
- VP-04: The Beacon public open space. Representative viewpoint of users of the public open space and residents in properties with elevated views towards the site;
- VP-05: Greenbank Open Space/ Pier at Greenbank Hotel (identified as a viewpoint on the local map from the Falmouth Town Council website). Representative viewpoint of users of the open space, pier, hotel, and people approaching Falmouth on Park & Float Ferry, Flushing Ferry, or on boats travelling southeast along the Penryn River;
- VP-06: Public right of way in the vicinity of Trevissome House and Sailors Creek within the Cornwall AONB. Representative viewpoint of users of the riverside path between Penryn and Little Falmouth;
- VP-07: Flushing Beach within the Cornwall AONB. Representative viewpoint of users of the beach, and residents of properties along Trefusis Road;
- VP-08: Public right of way between Penarrow Point and Trefusis Point within the Cornwall AONB. Representative viewpoint of users of the riverside path and those approaching Falmouth on the ferry from Truro;
- VP-09: Public right of way between St Just In Roseland and St Mawes within the Cornwall AONB. Representative viewpoint of users of the riverside path and those approaching Falmouth on the ferry from Truro;
- VP-10: St Mawes Castle within the Cornwall AONB. Representative viewpoint of visitors to the Castle, residents of properties on Castle Drive and users of the nearby public right of way;
- VP-11: South West Coast Path near Carricknath Point within the Cornwall AONB;
- Representative viewpoint of users of the path; and
- VP-12: St Anthony Head within the Cornwall AONB. Representative viewpoint of visitors to the peninsula and National Trust site, and users of the South West Coast Path.

21.2.18 A viewpoint from a small public open space at Jacketts Steps which is identified on the local map from the Falmouth Town Council website has not been included here. There is a building immediately to the east of this open space which limits views towards the site and directs them northwards. It is unlikely there would be any potential impacts from this location, and representative viewpoint VP-04 provides a more representative view towards the site from a nearby location.

21.3 Potential Impacts and Likely Effects

21.3.1 Table 21-1 and Table 21-2 present a summary of the scoping process, identifying which likely environmental effects (with respect to landscape, seascape, and visual) will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 21-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Upgrading of existing dock-side facilities	Landscape/Seascape – No Visual – No	Unlikely to be of a scale or nature of change to result in potentially significant landscape, seascape, or visual effects.
Extension to Queen's Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to temporary effects for landscape, seascape, and visual receptors.
Northern Wharf extension to suspended deck structure to Queen's Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to temporary effects for landscape, seascape, and visual receptors.
Removal of Northern Arm	Landscape/Seascape – Yes Visual – Yes	Potential contribution to temporary effects for landscape, seascape, and visual receptors.
New Western Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to temporary effects for landscape, seascape, and visual receptors.
Pocket dredge of Dockside Areas	Landscape/Seascape – Yes Visual – Yes	Potential contribution to temporary effects for landscape, seascape, and visual receptors.

Table 21-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Upgrading of existing dock-side facilities	Landscape/Seascape – No Visual – No	Unlikely to be of a scale or nature of change to result in potentially significant landscape, seascape, or visual effects.
Extension to Queen's Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.
Northern extension to suspended deck structure to Queen's Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.
Removal of Northern Arm	Landscape/Seascape – Yes Visual – Yes	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.
New Western Wharf	Landscape/Seascape – Yes Visual – Yes	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.
Pocket dredge of Dockside Areas	Landscape/Seascape – No Visual – No	Unlikely to be of a scale or nature of change to result in potentially significant landscape, seascape, or visual effects.
Vessels that will be used in the operational phase	Landscape/Seascape – No Visual – No	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Presence of FLOW blade devices	Landscape/Seascape – Yes Visual – Yes	Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors.

Likely Effects

21.3.2 Table 21-3 presents a summary of the scoping process, identifying which likely sensitive receptors (with respect to landscape and seascape) will be assessed in the EIA (i.e., with potential for significant effects and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 21-3: Landscape and Seascape Effects

Receptor	To be Assessed in the EIA (Yes/No)	Reason
NCA 152, Cornish Killas	No	The nature of the proposed development accords with existing character of the area and unlikely to result in significant effects on landscape character at this scale. Effects on landscape character will be considered and reported at a local scale for those receptors scoped in.
CA13, Fal Ria, Truro and Falmouth	No	The nature of the proposed development accords with existing character of the area and unlikely to result in significant effects on landscape character at this scale. Effects on landscape character will be considered and reported at a local scale for those receptors scoped in.
South Coast Central Section of the Cornwall AONB	Yes	The Site is not located within the South Coast Central Section of the Cornwall AONB and therefore will result in no loss or addition of landscape features within it. The perceptual impacts of the proposed development will be considered on the landscape character of the AONB.
Falmouth Conservation Area	No	The Falmouth Conservation Area is larger than, and encompasses, the Falmouth townscape character areas. Identification of effects arising from the proposed development is considered to be more appropriate at that refined scale.
Falmouth Character Area 1 (approximately 600 m from the site at the closest point)	No	Limited potential for the proposed development to impact the enclosed character of this area, which is further separated from the Site by Falmouth Character Area 3.
Falmouth Character Area 2 (approximately 900 m from the site at the closest point)	No	Limited potential for the proposed development to impact the enclosed character of this area, which is further separated from the Site by Falmouth Character Area 1 and Falmouth Character Area 3.
Falmouth Character Area 3 (approximately 300 m from the site at the closest point)	Yes	The Site is located outside the character area to the east, however it forms part of its wider landscape context with the potential for effects to its perceptual qualities.
Falmouth Character Area 4 (approximately 700 m from the site at the closest point)	No	Limited potential for the proposed development to impact the character of this area, which is further separated from the Site by Falmouth Character Area 1 and Falmouth Character Area 3.

Receptor	To be Assessed in the EIA (Yes/No)	Reason
Falmouth Character Area 5 (approximately 1,000 m from the site at the closest point)	No	Limited potential for the proposed development to impact the character of this area, which is further separated from the Site by Falmouth Character Area 1, Falmouth Landscape Character Area 2, Falmouth Character Area 3, and Falmouth Character Area 4.
Falmouth Character Area 6 (approximately 100 m from the site at the closest point)	Yes	The Site is located outside the character area to the north, however it forms part of its wider landscape context with the potential for effects to its perceptual qualities.
MCA 49: South Cornwall Coastal Waters and Estuaries	Yes	The Site is located within this seascape character area.

21.3.3 Visual impacts will be assessed for the 12 representative viewpoints identified in paragraph 21.2.17. Areas outside the zone of visual influence presented on Figure 20-1 are considered to have no potential visibility towards the proposed development due to the presence of topography, buildings, or dense vegetation.

21.4 Approach and Methodology

Approach

21.4.1 A Landscape, Seascape and Visual Impact assessment will be prepared in accordance with the principles outlined within the GLVIA.

21.4.2 GLVIA states that the need for an approach that is proportionate to the scale of the project being assessed and the nature of its likely effects. In accordance with GLVIA, within the assessment 'impact' will be defined as the action being taken and the 'effect' is defined as the change resulting from that action. In accordance with GLVIA it will specify the nature of the proposed development, describe the existing landscape, seascape, and visual amenity in the area that may be affected, predicting the effects, and considering how those effects might be mitigated.

21.4.3 This assessment will be led by a Chartered Member of the Landscape Institute. In carrying out the assessment, an independent stance will be taken. As appropriate, the assessment will address both the negative and positive aspects of the proposed development in a way that can be relied upon by all parties concerned.

21.4.4 The assessment will be informed by a combination of desk-top research, digital analysis, and site visits.

Viewpoints, Photography, and Visualisation

21.4.5 Representative viewpoint locations have been proposed in this Scoping Report and shown on Appendix 4H. Table 21-4 is extracted from Landscape Institute (LI) Technical Guidance Note (TGN) 06/19, Visual Representation of Development Proposals. The definitions within that table and associated document are used within this methodology.

Table 21-4: Visual Representation of Development Proposals

Table 2 Visualisation Types 1-4		Type 1	Type 2	Type 3	Type 4
		Annotated Viewpoint Photograph	3D Wireline / Model (non-photographic)	Photomontage / Photowire	Photomontage / Photowire Survey / Scale Verifiable
Aim of the Visualisation		To represent context and outline or extent of development and of key features	To represent 3D form of development / context	To represent appearance, context, form and extent of development	To represent scale, appearance, context, form, and extent of development
Photographic Equipment	Tripod	Recommended but discretionary	Not relevant	Recommended	Necessary
	Panoramic head	Not relevant		Recommended for panoramas	Necessary for panoramas
	Minimum Camera / Lens	Cropped frame or FFS + 50mm	Not relevant	Cropped frame or FFS + 50mm	Full Frame Sensor (FFS) + 50mm FL lens [1]
Locational Accuracy	Source of camera/viewpoint location data	GPS, OS Maps, geo-referenced aerial photography	Varies according to technology	Use good quality data: GPS, OS Maps, geo-referenced aerial photography, LiDAR	Use best available data: High resolution commercial data, LiDAR, GNSS, or measured / topographic surveys
	Survey-verified [2]	Not relevant			When appropriate
Data & Presentation	Verifiable (SNH) [3]	Not relevant			Required
	3D model	Not required	Required		
	Image Enlargement [4]	Typically 100%	Not relevant	Typically 100%	100% - 150%
	Form of Visualisation	sketch / outline / arrows	massing / wireline / textured	wireline / massing / rendered / textured to agreed AVR level [5]	
	Viewpoint mapping	Dedicated viewpoint location plan			Dedicated viewpoint location plan, + individual inset maps recommended
	Reporting of methodology and data sources	Outline description of sources and methodology recommended		Data, sources and methodology recommended	Verifiable data, sources and methodology required

21.4.6 It is proposed that Type 1 visualisations will be used to present the context and location of the proposed development from representative viewpoints.

21.4.7 All photography from each representative viewpoint will be taken using a Full Frame Sensor camera with 50 mm Fixed Focal Length Lens mounted on tripod, to provide consistency between all viewpoints. An image captured in this way is regarded as being the closest representative to that seen by the human eye when viewed at a width of 39 cm from a distance of 55 cm.

21.4.8 Photography is planned to be undertaken during the daytime in one season only (during worst-case winter months with trees out of leaf if timescales allow).

21.4.9 As the site of the proposed development will be identifiable within existing photographs, no Type 2, Type 3, or Type 4 visualisations are proposed.

Accompanying Figures

21.4.10 The assessment will be accompanied by the following figures on A3 size sheets at 1:25,000 scale:

- Topography and drainage, illustrating the topography of the area, contours, and locations of water courses and water bodies.
- Landscape context, identifying locations of landscape, townscape, and seascape character areas, landscape designations.
- Visual context, identifying visual barriers (buildings and woodland), public rights of way, public open space, representative viewpoint locations.
- Zone of theoretical visibility, utilising a digital surface model extending up to 5 km from the Site, to identify likely locations the Proposed Development would be visible.

21.4.11 Detailed assessment criteria are provided in Appendix 4I.

21.5 Preliminary Discussion of Mitigation and Enhancement Measures

21.5.1 Due to the location and nature of the site, there are limited opportunities to mitigate potential impacts. However, considerations include:

- Timing of construction activities in winter months when there are less visitors in the area to experience the landscape, seascape, and visual amenity of Falmouth and the Cornwall AONB;
- Screening or hoarding of construction activities where possible to do so;
- Designing any proposed elements of the scheme to provide interesting and positive components to the area, and/ or according with positive existing elements of the local character and vernacular;
- Improving the quality of low quality/ poor condition existing wharfs; and
- Provision of interpretation panels if appropriate at viewpoint locations, to provide information on the evolution of the landscape and seascape of Falmouth, setting the proposals at the Dock within their cultural and temporal context.

22. SOCIOECONOMICS

22.1 Introduction

22.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to socioeconomics.

22.2 Site Information and Baseline Conditions

22.2.1 Baseline socio-economic context of the site is provided below with reference to national statistics (i.e., England and Wales) and regional statistics (i.e., South West) to provide context to site specific information. Recent work to review the economic impact of the site has been undertaken and the results of which are not yet in the public domain but have been used to support this section. Information specific to Falmouth Docks is taken from the Economic Impact of Proposed Redevelopment at Falmouth Docks.

Demographics

22.2.2 The population of Cornwall was estimated to be 570,300 in 2021 (ONS). The population size has increased 7.1% from 2011. The rate of population growth is higher than the overall increase for England and Wales (6.3%) but lower than South West's (7.8%). Nearby areas like Torridge and West Devon saw similar population increases averaging at 6.6%. On the other hand, the Isles of Scilly saw a fall of 4.7% in the same period. The projected population change in Cornwall between mid-2018 and mid-2028 is estimated to be 9.3%[95].

Economic Participation

22.2.3 Employment rates in Cornwall peaked in 2017 and between 2019 and 2022 fell by 1.7%. The local employment rate is below the regional average but above the national average. In 2022 (July 2021 to June 2022) the Cornish employment rate (proportion of the working age population in employment) was 76.3% as opposed to the regional average of 78.4%. Unemployment rates on the other hand are lower in Cornwall (2.5%) than the regional average (2.8%) and the national average (3.9%).

Wage Levels

22.2.4 2021 wage levels in Cornwall are shown in Table 22-1. Average earnings are about 19% lower than the South West region and 32% lower than England and Wales as a whole. Growth rates over the preceding five years are also lower.

95 ONS, 2020. Subnational population projections for England: 2018-based, online. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2018based [Accessed 12/09/2022]

Table 22-1: Average Gross Annual Earnings, ONS 2022

	Cornwall	South West	England and Wales
Average Gross Annual Earnings in 2021	£29,214	£34,755	£38,560
Average Gross Annual Earnings as a Percentage of England and Wales Average	75.8%	90%	100%
Average Annual Growth Rate of Gross Annual Earnings 2016-2021	1.1%	1.8%	1.9%

Sectoral Composition

22.2.5 The sectoral breakdown by employment in Cornwall is dominated by Wholesale and retail trade; repair of motor vehicles and motorcycles (18.4%), human health and social work activities (16.6%) and accommodation and food services activities (15.7%). Public Administration and Defence and Financial and insurance activities employ a smaller proportion of the workforce than in the South West region and England and Wales as a whole.

Deprivation

22.2.6 The Indices of Multiple Deprivation (IMD) is a measure for comparing the relative deprivation of different areas. The lower the IMD score the less deprived an area is. Within Cornwall, 43 LSOAs (13% of total LSOAs) is amongst the 20% most deprived neighbourhoods in England. Parts of Falmouth are among the most deprived in the UK, as shown in Figure 22-1.

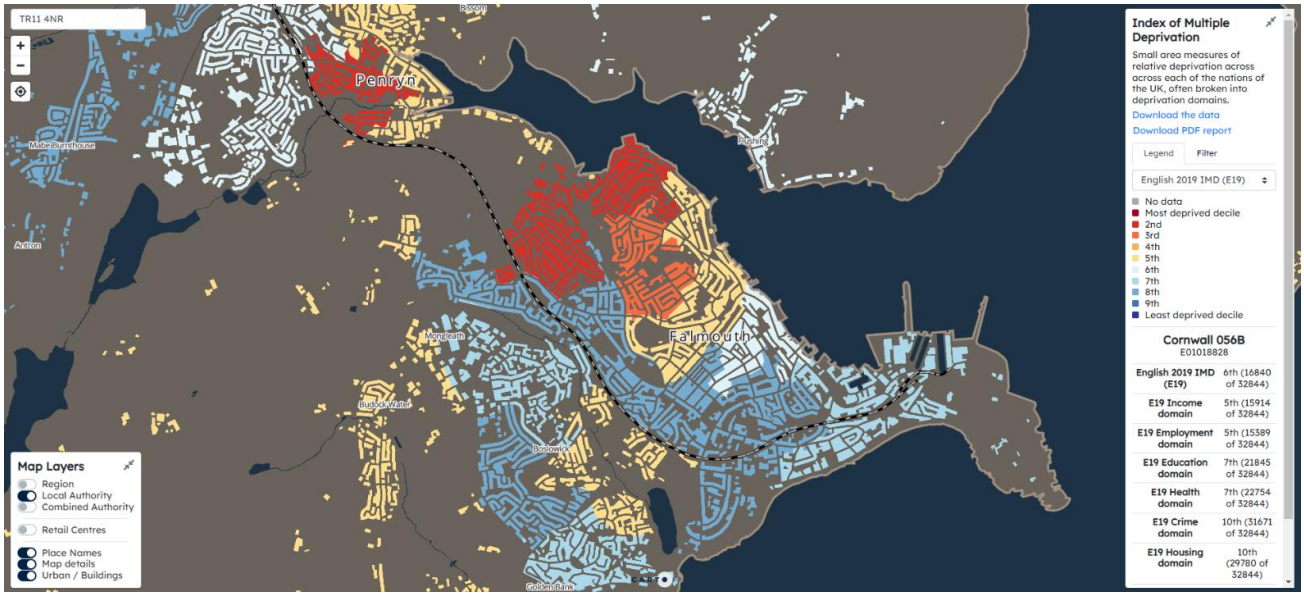


Figure 22-1: Indices of Multiple Deprivation, CDRC 2022

Education Levels

22.2.7 Qualification levels for Cornwall, the South West and England and Wales are shown in Table 22-2. A greater proportion of individuals in South West hold qualifications at NVQ levels 1-4 than in

Cornwall. Cornwall also has a higher percentage of people with no qualifications in comparison to the region.

Table 22-2: Educational Qualifications, ONS 2022

	Cornwall	South West	England and Wales
NVQ4 and above	36.4%	42.0%	43.0%
NVQ3 and above	57.3%	62.7%	61.2%
NVQ2 and above	77.9%	80.3%	78.0%
NVQ1 and above	90.2	90.8%	87.6%
Other qualifications	4.3%	4.2%	5.9%
No qualifications	5.6%	5.0%	6.5%

Baseline Contribution of Falmouth Docks

Economic Activities

22.2.8 In its current condition, the site is able to serve a number of industries including commercial cargo shipping, cruise and military vessels although the limited berth capacity creates conflicts between these uses. A&P's Falmouth facility is the largest ship-repair complex in the UK.

Commercial Cargo and Operations

22.2.9 In 2019, 152,000 freight tonnage flowed through Falmouth (both directions), down from a high of 753,000 tonnes in 2007. However, it is important to note that the peak values seen in 2006-2008 also reflects a considerable amount of 'bunkering' e.g., of oil and other products, that was using the facilities at Falmouth Harbour at that time. This scale of this bunkering dropped off and partly (but not wholly) explains the overall drop in cargo volumes seen over the last decade.

22.2.10 Falmouth represents only a small proportion of the overall UK freight market – less than 0.1% of freight volume flowed through Falmouth in 2019. The market tends to be dominated by the major ports such as London Gateway, Grimsby & Immingham, Southampton, and Felixstowe.

22.2.11 However, the site is an important export site for glass recycling collected from the wider county of Cornwall. The site is also a significant export location for local granite quarried at Mabe; the quarry is understood to have planning permission in place for 100 years and so this demand is not anticipated to reduce in the future. A number of commercial operations are based at the site, including FalFish commercial fisheries and fish landings which are proposed to be maintained as part of the proposed development.

Cruise Vessels

22.2.12 The site serves as a frequent cruise destination throughout the cruise season (April to October); at present approximately eight to nine vessels visit the site per month throughout these months. Vessels do not often stay in Falmouth for longer than 24 hours, and many arrive on the morning tide and depart on the evening tide. Each vessel brings 2,000-2,500 passengers to the local area. Since the COVID-19 pandemic and the restart of cruise activities in July 2020, the capacity within the sector has gradually grown, and the latest industry updates project that passenger volumes

will recover to 101% of 2019 levels by the end of 2022 and by 2026 passenger volumes are anticipated to be 12% above 2019 levels[96]. Cruise bookings in the 2021, 22 and 23 have exceeded previous years bookings, showing good growth. Approximately 59 cruise calls are booked for 2023, a record number, showing a strong interest in Falmouth in the market.

Economic Contribution

22.2.13 FDEC and A&P Falmouth employ around 325 skilled jobs at the site and generate on average annual revenue of £51.3m. The direct Gross Value Added was estimated at £18.1m in 2021.

Outlook for Cruise Market

22.2.14 Since the restart of cruise activities in July 2020 following the COVID-19 pandemic the capacity within the sector has gradually grown. In the latest industry update it is projected that just short of 100% of CLIA ocean-going capacity is projected to be operational by the end of July 2022[96].

22.2.15 From a passenger perspective, nearly 80% of travellers who have cruised before say they will cruise again, the same proportion as before the pandemic.

22.2.16 In the baseline forecast, passenger volume is expected to recover and surpass 2019 levels by the end of 2023. In the upside forecast, passenger volume is expected to recover to 101% of 2019 levels a year earlier, by the end of 2022. In all three scenarios, passenger volume is projected to recover in excess of 12% above 2019 levels by the end of 2026.

Outlook for Freight Cargo Market

22.2.17 According to published statistics, the volume of freight traffic has fallen over the past 15 years when measured by tonnage[97]. The latest data shows that approximately 438 million tonnes of freight traffic flowed through UK ports in 2019. UK freight volumes are approximately 86% of 2005 levels. However, in Falmouth specifically, freight volume has fallen more significantly through Falmouth (39% of 2005 levels), with a particular fall from 2010 onwards.

Outlook for Floating Offshore Wind

22.2.18 Independent research commissioned by the A&P Group and undertaken by the Offshore Renewable Energy (ORE) Catapult highlights the strong opportunities in relation to floating wind market, particularly with the anticipated amount of project development activity in the Celtic Sea and the creation of the Celtic Sea Developers Alliance. Previous work undertaken by the ORE Catapult that focused on the potential benefits of Floating Offshore Wind (FLOW) to the regional economy, noted that in terms of ports and logistics, suitable and well-located facilities are important to all areas of assembly, installation and operations.

22.3 Potential Impacts and Likely Effects

22.3.1 The following sensitive receptors have been identified during the demolition and construction stage of the proposed development:

- Local employment: increased local employment through construction, temporary loss of employment for businesses located on site through disruption caused by construction activities; and

96 Cruise Lines International Association, 2022. Economic Impact Studies: State of the Cruise Industry Outlook 2022, online. Available at: https://cruising.org/en-gb/news-and-research/research/2022/january/state-of-the-cruise-industry-outlook-2022 [Accessed 12/09/2022]
97 Department for Transport, 2022. National Statistics: Port Freight Annual Statistics, 2021, Overview of port freight statistics and useful information, online. Available at: All UK major and minor port freight tonnage traffic – Department for Transport statistics

- Local economy: indirect effect of increased employment on local economy.

22.3.2 The following sensitive receptors have been identified during the completed development stage:

- Port business: additional direct revenue to port-based businesses (existing and new) such as cruise ships, cargo activity and FLOW;
- Local and regional tourism: additional spend by cruise passengers and crew, associated additional tourism employment through cruise visitors to Falmouth and Cornwall
- Local and regional employment: additional employment by the client associated with the offshore wind industry alongside existing port operations, increased capacity following the proposed development.

22.3.3 Table 22-3 and Table 22-4 present a summary of the scoping process, identifying which likely socioeconomic effects, with respect to the proposed development, will be assessed in the EIA (i.e. considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e. 'scoped out'), along with a justification for this decision.

Table 22-3: Potential Demolition and Construction Effects

Potential Effect	To be assessment in the EIA (Yes/No)	Reason
Local employment through construction (direct construction jobs created, net additional FTE jobs by area)	Yes	Likely to increase during the demolition and construction process, although temporary disruption to existing businesses during the demolition and construction stage could occur.
Indirect impact of construction workers in the local economy	Yes	Likely to increase during the demolition and construction process due to increased local employment

Table 22-4: Potential Completed Development Effects

Potential Effect	To be assessment in the EIA (Yes/No)	Reason
Additional direct revenue to port-based businesses; related to the expansion of cargo activity	Yes	Likely to increase upon completion of development due to increased berth capacity
Additional direct revenue to port-based businesses; related to ship repair industry	No	Existing ship repair industries are not considered to be significantly affected by the proposed development
Additional direct revenue to port-based businesses related to FLOW	Yes	Exploration of market opportunity resulting in increased revenue
Additional direct revenue to port-based businesses from cruise ships	Yes	Likely to increase upon completion of development due to increased number and size of cruise ships

Potential Effect	To be assessment in the EIA (Yes/No)	Reason
Additional spend by cruise passengers and crew in terms of local and regional tourism	Yes	Likely to increase upon completion of development due to increased number and size of cruise ships
Additional tourism employment through cruise visitors	Yes	Likely to increase during completed development stage of proposed development due to increased number and size of cruise ships able to use the site
Additional employment by A&P Falmouth and other port-related businesses	Yes	Likely to increase upon completion of development due to increased number and size of cruise ships

22.4 Approach and Methodology

Baseline Data Collection

22.4.1 The assessment of the impacts of the proposed port expansion on the local economy and society, including employment, will be based on publicly available data such as ONS and NOMIS local statistics, and information provided by the client on the economic setting of the proposed development. Any revisions to the Economic Impact Report will be included within the baseline.

Assessment Method

22.4.2 The assessment will use data and assumptions on:

- Forecast of additional cruise passengers;
- Assumptions on percentage of cruise passengers going ashore during day call cruise ship visits, assumptions on their spend, assumptions on taxis or hire car spending, assumptions on turnaround passengers' onshore spending;
- Assumptions of the ratio of passengers to crew members, and percentage of the crew disembarking on day visits and/or spending a night ashore;
- Assumption of the amount of additional spending required to support an additional tourist sector job;
- Estimations of local and regional multiplier effects as regards the proportion of extra indirect and induced employment which is generated further up the supply chain within the area due to extra direct employment for port-related businesses; and
- Assumptions on the additional revenues and job creation related to sectors.

22.4.3 The chapter will provide a qualitative assessment of impact significance by considering net additional employment generated, additional visitor spend, net impact on the local and regional economy through assumptions on leakage, displacement and substitution effects.

22.4.4 Local employment will be assessed by using the number of direct construction jobs created and the total duration of the demolition and construction stage (in years), using standard construction industry GVA per employee values and net additional FTE jobs by area.

22.4.5 Impacts on port business will be assessed by using data on direct port revenues per year in comparison with assumed revenue from the proposed development.

22.4.6 Impacts to local and regional tourism will be assessed using forecasted cruise passenger and vessel numbers for Falmouth, including assumptions related to the percentage of cruise passengers going ashore, turnaround passengers (those staying overnight), and their level of spend ashore. Impacts associated with additional tourism employment through cruise visitors will be assessed based on forecasted additional spend by passengers and crew.

22.4.7 Any impacts to local and regional employment will be estimated using local and regional multipliers.

22.5 Preliminary Discussion of Mitigation and Enhancement Measures

22.5.1 Potential mitigation/enhancement measures that could be employed during all stages of the proposed development will be discussed further as part of the ES, but could include:

- Use of local suppliers and employment as first priority to support supply chain expenditure within Cornwall (estimated at 44%)

23. POPULATION AND HEALTH

23.1 Introduction

23.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to population and health. Issues relating to economic activity and employment are discussed in Section 22: Socioeconomics.

23.2 Site Information and Baseline Conditions

23.2.1 Cornwall is divided into 19 community network areas (CNA), where local priorities and strategies can be addressed and the wellbeing of the local area can be promoted. The application site lies within the Falmouth and Penryn CNA, which had an estimated population of 48,130 people in 2020, of which 48.2% were male and 51.8% were female. 63.9% of the population is of working age, with 22.1% of retirement age and 14.0% aged under 16. The large majority (94.4%) of the population is White British, with the next largest ethnic group White non-British (3.1%). In line with this, the large majority of the population was born in England (91.0%) and almost all households (97.2%) are comprised of residents who all speak English as their main language[98].

23.2.2 The area has a high seasonal tourist influx and there is a large student population[99]. This affects migration patterns in the CNA, with the largest proportion of people moving both into (193 people per 1,000 population) and out of (243 people per 1,000 population) the CNA aged between 15 and 24 years old. It also affects household composition in the CNA, with 3.4% of households comprising student households. The relatively high proportion of retirement age residents is reflected in the fact that 26.6% of households are pensioner households, while 16.3% are one-person households, 29.7% are married couples and 9.4% are cohabiting couples[100].

23.2.3 Based on the 2019 Indices of Multiple Deprivation, 5,107 people in the CNA (10.7%) live in the most deprived 20% of areas in England. The area scores particularly poorly in terms of deprivation relating to the living environment and barriers to housing and services (44.6% and 22.3% of the population living in the most deprived 20% of areas in England respectively), better in terms of deprivation relating to income and employment (14.1% and 10.7% of the population living in the most deprived 20% of areas in England respectively), and well in terms of deprivation relating to crime, health and education (0%, 6.6% and 7.2% of the population living in the most deprived 20% of areas in England respectively).

23.2.4 Total life expectancy in the CNA is higher for females (84 years) than males (80 years). These figures are the same as for the South West as a whole and slightly above the female figure (83 years) for England. Healthy life expectancy, an estimate of how many years people might live in 'full health', is lower for both males and females, at 65 and 67 years respectively. These figures are the same as for the South West as a whole, but above the figures for England (63.5 years for males and 64.8 years for females).

23.2.5 The standardised mortality ratio provides an indication of whether mortality rates are higher or lower than expected; a figure of more than 100 indicates there is a higher proportion of deaths than expected, while a figure below 100 indicates there is a lower proportion of deaths than expected. This suggests that deaths from coronary heart disease (117), circulatory disease (115)

98 OCSI, 2022, Local Insight profile for 'Falmouth and Penryn CNA' area
99 Cornwall Council, 2017, Falmouth & Penryn CNA Profile
100 OCSI, 2022, Local Insight profile for 'Falmouth and Penryn CNA' area

and stroke (115) in the CNA are relatively high, deaths from cancer are around average (102) and deaths from respiratory disease (94) are relatively low. 18.8% of the CNA's population lives with a limiting long-term illness, slightly above the figure for the South West (18.4%) and England (17.6%) as a whole.

23.2.6 People's lifestyles in the CNA are generally slightly healthier than the regional and national averages, with slightly lower levels of binge drinking (17.8% of people in the CNA, compared to 20.7% in the South West and 20.0% in England) and smoking (21.0% of people in the CNA, compared to 21.4% in the South West and 22.2% in England), lower levels of obesity for both children (16.4% in year 6 are obese in the CNA, compared to 17.1% in the South West and 20.4% in England) and adults (23.3% are obese in the CNA, compared to 24.7% in the South West and 24.1% in England), and higher levels of physical activity (72% of people in the CNA are classed as physically active, compared to 68% in the South West and 64% in England)[101].

23.2.7 There are four GP surgeries in the CNA: Penryn Surgery, Falmouth Health Centre, Trescobeas Surgery, and Westover Surgery. Together, they have a total of 29 full-time equivalent GPs and 47,763 patients. This equates to an average of 1,647 patients per full-time equivalent GP, which is within the Department of Health standard for GP provision of 1,800 patients per full-time equivalent GP[102].

23.3 Potential Impacts and Likely Effects

23.3.1 The following sensitive receptors have been identified:

- Population and demography;
- Health and wellbeing;
- Healthcare; and
- Public health and safety.

23.3.2 Table 23-1 and Table 23-2 present a summary of the scoping process, identifying which likely environmental effects, with respect to population and human health, will be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 23-1: Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Increased population and associated changes to demography during construction as a result of increased employment at the site	No	Local contractors and staff will be used during construction as far as possible, so no significant influx of population is predicted. Any increase in population would also be temporary when staff are present and is not likely to be significant
Effects on health and wellbeing of local residents as a result of increased emissions and dust generation during construction	No separate health assessment – potential secondary/ indirect health effects to be considered in	As set out in Section 18, there is the potential for increased dust generation and emissions from traffic and vessels during construction. This will be assessed in the ES and mitigation identified to prevent significant indirect health effects, which will be implemented through a CEMP

[101] OCSI, 2022, Local Insight profile for 'Falmouth and Penryn CNA' area.
[102] NHS Digital General Practice Workforce Interactive Dashboard, accessed 29.09.22.

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
	the air quality chapter	
Effects on health and wellbeing of local residents as a result of increased noise during demolition and construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the noise chapter	As set out in Section 16, there is the potential for increased noise during demolition and construction, including from increased traffic. This will be assessed in the ES and mitigation identified in the form of Best Practicable Means to prevent significant indirect health effects, which will be implemented through a CEMP
Effects on health and wellbeing of construction workers and local residents as a result of mobilisation of contamination or pollution incidents during construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the marine water and sediment quality chapter	As set out in Sections 6 and 7, there is the potential for contaminated sediments to be mobilised by dredging or construction works, which will be assessed in the ES and mitigation identified to prevent significant indirect health effects. Standard demolition and construction practices, such as appropriate PPE, will mitigate the potential for significant risks from other sources
Effects on health and wellbeing of local residents from increased employment during construction	No	While the proposals will lead to an increase in employment during construction, as set out in Section 22, this will be temporary and is therefore unlikely to lead to significant health and wellbeing benefits
Risks to public health and safety from collisions between construction vessels and commercial vessels or recreational craft during construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the Navigation Risk Assessment	As set out in Section 14, a navigation risk assessment will be undertaken to identify potential risks and associated mitigation requirements to ensure that there will be no significant increase in risks to public health and safety from marine accidents during construction
Risks to public health and safety from construction works	No	Access to the docks is restricted, so there will be no public access to the construction areas. Cruise vessels are contained and managed, so procedures will be in place to manage visitors if these coincide with construction
Risks to public health and safety from a major accident during construction	No	As set out in Section 24, appropriate consultation and design and the continued operation of Falmouth Petroleum Ltd's site in accordance with regulations and guidance means that no significant risks to public health and safety are predicted from a major accident during construction
Increased pressure on local healthcare services during construction	No	As it is envisaged that local contractors will be used where possible during construction, workers are already likely to be registered with a GP. As the construction works will not lead to significant adverse health effects, there is no potential for increased pressure on local healthcare services

Table 23-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Increased population and associated effects on demography post-construction	No	The proposed development does not include any residential elements, so will not lead to post-

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		construction changes in population or demography
Increased pressure on local healthcare services post-construction	No	As the proposed development will not increase the area's population or lead to significant health effects, there is no potential for increased pressure on local healthcare services post-construction. In addition, cruise vessels provide their own onboard health and medical services, so increased passenger numbers will not increase pressure on local healthcare services
Effects on health and wellbeing of local residents as a result of increased traffic and shipping emissions generation post-construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the air quality chapter	As set out in Section 18, the good baseline air quality in the area means that no significant health effects are envisaged due to increased emissions from traffic and vessels post-construction
Effects on health and wellbeing of local residents as a result of increased noise from traffic, new fixed plant and new dock operations post-construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the noise chapter	As set out in Section 16, there is the potential for increased noise from road traffic, new fixed plant installations and new operational noise sources. This will be assessed in the ES and mitigation identified to prevent significant indirect health effects, including through port management procedures. In addition, the proposed development will allow noisier cargo operations will be moved further along the dock, away from sensitive residential receptors
Effects on health and wellbeing of local residents from pollution incidents post-construction	No	As set out in Section 6, continuing management procedures currently in place at Falmouth Harbour will mitigate this risk
Effects on health and wellbeing of local residents from increased employment post-construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the socio-economics chapter	As set out in Section 22, employment is likely to increase post-construction due to the increased number and size of cruise ships and associated increase in tourism and employment at the docks, which has the potential to lead to improved health and wellbeing through reduced deprivation
Risks to public health and safety from collisions between commercial vessels and / or recreational craft post-construction	No separate health assessment – potential secondary/ indirect health effects to be considered in the navigation and recreation chapter	As set out in Section 14, a navigation risk assessment will be undertaken to identify potential risks and associated mitigation requirements to ensure that there will be no significant increase in risks to public health and safety from marine accidents post-construction
Risks to public health and safety from a major accident post-construction	No	As set out in Section 24, appropriate consultation and design and the continued operation of Falmouth Petroleum Ltd's site in accordance with regulations and guidance means that no significant risks to public health and safety are predicted from a major accident post-construction

23.4 Approach and Methodology

23.4.1 As set out in Table 23-1 and Table 23-2, a specific population and health ES chapter is proposed to be scoped out of the EIA. However, several assessments that are proposed to be scoped into the EIA will consider the proposed development's potential secondary or indirect effects on health and wellbeing. These include the following chapters and assessments:

- Air quality;
- Noise and Vibration;
- Socioeconomics; and
- Water quality and sediment quality.

23.4.2 In addition, the following standalone assessments to be submitted in support of the application for consent will also consider the proposed development's potential secondary or indirect effects on health and wellbeing:

- Navigation Risk Assessment

23.4.3 The potential for secondary or indirect effects on health and wellbeing from major accidents and disasters was also considered as part of the scoping exercise, but no further assessment is required.

23.5 Preliminary Discussion of Mitigation and Enhancement Measures

23.5.1 Preliminary information on mitigation relating to effects that will be addressed elsewhere in the ES can be found in the relevant sections of this report, as discussed above. As set out within Section 23.3, no likely significant effects are anticipated and therefore population and health will be scoped out of the ES.

24. MAJOR ACCIDENTS AND DISASTERS

24.1 Introduction

24.1.1 This section summarises the potential environmental impacts and likely effects that are at this stage anticipated to arise in connection with all stages of the proposed development relating to Major Accidents and Disasters.

24.1.2 The 2017 EIA Regulations state that "…a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned" should be provided within the ES. There is no recognised guidance on the assessment of major accidents and disasters. However, IEMA provides guidance[103] on the approach to Major Accidents and Disasters assessments.

24.1.3 The vulnerability of the proposed development to relevant major accidents is considered within this chapter. Major accidents are events (accidental or deliberate) that threaten human health, welfare and/or the environment beyond reasonable management. These events can be caused by both natural and man-made hazards. Natural hazards are categorised as geophysical, hydrological, climatological, meteorological, and biological. In addition to the assessment of vulnerability, the potential for the proposed development to introduce a new risk source, or to increase the risk of surrounding infrastructure to a major accident is also considered.

24.1.4 All demolition, construction and completed development activities will be subject to stringent controls and regulatory oversight under existing safety and environmental legislation. It should be noted that major accidents as assessed in this chapter are considered to be low likelihood, high consequence events.

24.2 Site Information and Baseline Conditions

24.2.1 The site is not located within a geographical region that has historically been subject to natural disasters.

24.2.2 Falmouth Petroleum Limited[104] ('Falmouth') operate a fuel storage and distribution centre, which is classified as an upper tier Control of Major Accident and Hazard (COMAH) establishment. The site is located at 'The Docks', TR11 4NR within the red line boundary for the site, Figure 2-1. Hazards associated with Falmouth Petroleum Limited are considered to be man-made, through the accidental release of dangerous substances, explosions and fire[105]. Bunkering storage facilities on site are operated by World Fuels and are operated under the COMAH regulations.

[103] IEMA, 2020. Major Accidents and Disasters in EIA: A Primer, online. Available at: https://www.iema.net/document-download/48915 [Accessed 05/10/2022]
[104] HSE, 2021. COMAH UPPER and LOWER Tier Establishment List July 2021. Available at: https://www.whatdotheyknow.com/cy/request/775306/response/1839705/attach/html/2/COMAH%20UPPER%20and%20LOWER%20Tier%20Establishment%20List%20July%202021.pdf.html [Accessed 02/09/2022]
[105] HSE, 2022. Public Information on Falmouth. Available at: https://notifications.hse.gov.uk/COMAH2015/PublicInformation.aspx?piid=3109 [Accessed 02/09/2022]

Figure 24-1: Upper Tier COMAH Sites in South West Cornwall

24.2.3 Guidance on the Health and Safety Executive (HSE) website shows that the proposed development site lies within the explosive safeguarding zone of this major hazard site and is therefore within the distance whereby consultation with HSE is required[106]. Consultation will be undertaken outside of the EIA process. The site is also understood to store ammonium nitrate under appropriate conditions to comply with COMAH and Dangerous Substances Regulations 1990

24.3 Potential Impacts and Likely Effects

24.3.1 The following sensitive receptors have been identified:

- All living receptors and infrastructure located within the site and surrounding area during the demolition and construction stage; and
- All living receptors and infrastructure located within the site and surrounding area during the completed development stage.

24.3.2 Table 1 in Appendix 4J serves as a screening exercise for major accidents and disasters, identifying any likely environmental effects, with respect to all types of major accidents and disasters that should be taken forward into the scoping stage to determine if these effects should be assessed in the EIA (i.e., considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

24.3.3 Table 24-1 and Table 24-2 present a summary of the scoping process, identifying which likely socioeconomic effects, with respect to the proposed development, will be assessed in the EIA (i.e.,

[106] HSE, 2022. HSE's Planning Advice Web App. Available at: https://www.hse.gov.uk/landuseplanning/planning-advice-web-app.htm [Accessed 08/09/2022]

considered potentially significant and therefore 'scoped in') and those which will not be assessed further (i.e., 'scoped out'), along with a justification for this decision.

Table 24-1 Potential Demolition and Construction Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Water Contamination and Release of Contaminants	No	The site has protocols in place to address water contamination events and all users of the site adhere to these procedures. The demolition and construction stages would be implemented under an appropriate CEMP to manage any risks associated with the release of contaminants. GI works and asbestos surveys on buildings and structures proposed to be demolished (if required) would record the potential presence of any contaminants and identify appropriate ways to remove/ manage them before demolition and construction works begin. Falmouth Petroleum and associated bunkering storage facilities on site are operated by World Fuels and are operated under the COMAH regulations and risks during the construction stage are managed by these regulations. These are considered sufficient to manage the risks of contaminant release.

Table 24-2: Potential Completed Development Effects

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
Severe Weather – Storms	No	The proposed development is considered to be resilient to storms through the implementation of design standards with an inclusion of climate change allowances that accommodate for greater storm events in the future. Strong winds associated with storm events will be factored into the design of the proposed development in respect of structural integrity and appropriateness of any above deck features.
Floods	No	The proposed development is required to be water compatible and therefore resilient to flooding through the implementation of design standards with an inclusion of climate change allowances that accommodate for greater flooding in the future. Flood risk will be considered within the supporting FRA, where assessment methodologies and best-practice mitigation measures will be outlined.
Water Contamination and Release of Contaminants	No	The site has protocols in place to address water contamination events and all users of the site adhere to these procedures. The development and its operations are not considered to be vulnerable to water contamination. Falmouth Petroleum and associated bunkering storage facilities on site are operated by World Fuels and are operated under the COMAH regulations. These are considered sufficient to manage the risks of contaminant release.
Transport Accidents (Marine and Terrestrial)	No	Marine transport accidents are managed through the implementation of safety protocols as required by the port under their powers as Harbour Authority. Safety protocols are well-established and are considered effective to be resilient to transport accidents. Navigation risks during both the demolition and construction stage and the completed development stage will be addressed within the ES and supporting assessments. The proposed development is also considered to improve major marine incident response times through increased capacity at the site. Terrestrial transport accidents associated with other road networks are not considered to affect the proposed development.
Fire Risks and Explosives	No	The site operates under all required Fire Safety and HSE requirements, and the adjacent Falmouth Petroleum is also considered to operate under these regulations to demonstrate compliance with the relevant UK laws and COMAH Regulations. Urban fires will be mitigated through appropriate design of any buildings in accordance with Building Regulations and relevant safety guidance, in addition to the established 999 emergency response procedures in place in Falmouth and Cornwall. These measures will remain in place for the proposed

Potential Effect	To be Assessed in the EIA (Yes/No)	Reason
		development and are considered to provide resilience to the threat of fire. FDEC also operate under an explosive licence and deemed consent for ammonium nitrate storage.

24.4 Approach and Methodology

24.4.1 It is considered that the majority of major natural disasters, such as epidemics, earthquakes, volcanic eruptions and droughts are not of relevance to the site or proposed development; however, vulnerability to flood risk and storm events and disasters related to navigation issues are considered to be relevant.

24.4.2 No additional effects associated with major accidents and disasters have been identified that would not be addressed through supporting assessments as part of the EIA. Therefore, no further assessment with regards to major accidents and disasters is considered to be required as part of the proposed EIA.

24.5 Preliminary Discussion of Mitigation and Enhancement Measures

24.5.1 None considered to be required as part of this technical assessment due to consideration of the mitigation and enhancement measures in place for other technical chapters to address specific issues.

25. SUMMARY AND CONCLUSIONS

25.1.1 The potential significant environmental effects of the application have been identified as part of this scoping exercise, and it is proposed that these be included in the EIA. The scoping assessment has also identified effects that are deemed not likely to be significant and therefore "scoped out" of the EIA, as outlined in the chapters above.

25.1.2 A number of technical disciplines have been scoped out of the EIA for the proposed development on the basis that supporting technical assessments will be undertaken that would sufficiently address the potential effects identified. These are:

- **Flood Risk** – Changes to wave conditions during the operational life of the scheme will be covered within a FRA;
- **Terrestrial Ecology and Ornithology** – no significant effects identified, but terrestrial ecology to be covered within an EcIA to support planning should this be required. Designated sites to be assessed within an HRA required to determine potential impacts to the SAC and SPA; and
- **Navigation and Recreation** - Navigational Risk to all identified sensitive receptors during all stages of the proposed development will be covered within a NRA.

25.1.3 A number of technical disciplines have been scoped out of the EIA for the proposed development on the basis that no significant effects are considered as a result of the demolition, construction and completed development stages. These are:

- **Ground conditions –** no potential significant effects identified at all stages of the proposed development;
- **Major Accidents and Disasters -** no potential significant effects identified at all stages of the proposed development;
- **Population and Health** – potential effects on population and health are considered to be addressed within other chapters or assessments, such as Air Quality, NRA, Noise & Vibration and Socioeconomics.

25.1.4 Table 25-1 summarises the topics scoped in, the topics scoped out on the basis of a standalone assessment, and the topics scoped out on the basis of no significant effects considered likely.

Table 25-1: Scoping Summary

Scoped in Topics	Scoped out Topics*	Scoped out Topics**
Coastal Processes and Sediment Regime	Flood Risk	Ground conditions
Marine Water and Sediment Quality	Terrestrial Ecology and Ornithology	Population and Health
Marine Ecology	Navigation and Recreation	Major Accidents and Disasters
Commercial Finfisheries and Shellfisheries		
Marine Archaeology		
Heritage		
Transport		

Scoped in Topics	Scoped out Topics*	Scoped out Topics**
Noise and Vibration		
Underwater Noise		
Air Quality		
Climate Change		
Material Resources and Waste		
Landscape, Seascape and Visual Amenity		
Socioeconomics		

Notes
* on the basis of a standalone assessment appended to ES
** on the basis on no significant effects considered likely

25.1.5 Scoped in effects are provided in Table 25-2 and will form the technical scope of the EIA, and an assessment undertaken by competent experts will be carried out. Details regarding the basis for these decisions and the methodology for those topics scoped in are provided in Sections 5-24.

Table 25-2: Summary of Potential Effects Scoped In

Scoped in Topics	Potential Effects Scoped in
Coastal Processes and Sediment Regime	Demolition and Construction: • Increased suspended sediment concentration; • Release and dispersion of contaminants into the water column; • Increased fine sediment deposition due to sediment release; and • Deposition of contaminated fine sediment.
	Completed Development: • Changes to tidal currents; • Changes to wave conditions; • Changes to patterns of sediment transport; • Changes to patterns of erosion and accretion; • Scour close to structures; • Increased suspended sediment concentration during maintenance dredging; and • Increased fine sediment deposition during maintenance dredging.
Marine Water and Sediment Quality	Demolition and Construction: • Formation of pathways between contaminated sediments or surface waters and the underlying Secondary A aquifer • Mobilisation of contaminated sediments during capital dredging and construction works (including demolition/removal of some of the existing marine structures) potentially causing adverse effects on human and ecological receptors in the vicinity, but also removing source of contamination from the site • Mobilisation of contaminated sediments during capital dredging and construction works (including demolition/removal of some of the existing marine structures) potentially causing adverse effects to the water quality in the River Fal in the vicinity of the site • Release, dispersion and fate of material placed at disposal site (at sea)

Scoped in Topics	Potential Effects Scoped in
	Completed Development: • Increased suspended sediment concentration in water column during maintenance dredging, and subsequent deposition on nearby habitats
Marine Ecology	Demolition and Construction: • Propeller wash and wake wash resulting in disturbance to benthic habitats • Shading and overshadowing • Noise and disturbance from vessel movements, piling and dredging • Permanent and temporary loss and disturbance to habitats within the vicinity of piling resulting from scour or subsequent sediment mobilisation • Increased suspended sediment concentrations, sediment mobilisation and potential for smothering, caused by dredging operations
	Completed Development: • Vessel strike causing injury to marine mammals
Commercial Finfisheries and Shellfisheries	Demolition and Construction: • Temporary and permanent exclusion of fishermen/fishing effort from fisheries/harvesting areas in the vicinity of the site • Temporary and permanent displacement of stock away from the site • Temporary and permanent depletion of stock
	Completed Development: • Permanent displacement of fishing effort
Marine Archaeology	Demolition and Construction; • Physical disturbance to the seabed and sub-seabed; • Physical disturbance activities causing indirect changes to hydrodynamic and sedimentary regimes leading to sediment reduction on the seabed; • Physical disturbance activities causing indirect changes to hydrodynamic and sedimentary regimes leading to sediment accretion on the seabed; • Temporary change to the setting of a heritage receptor; and • Temporary change to the character of the historic seascape.
	Completed Development: • Permanent change to the setting of a heritage receptor as a result of the dredging, demolition, and construction stages; and • Permanent change to the character of the historic seascape.
Heritage	Demolition and Construction: • Partial truncation or complete removal of known and as yet unknown archaeological remains.
	Completed Development: • Harm to designated heritage assets by way of a change in their setting.
Transport	Demolition and Construction: • Severance; • Driver delay; • Pedestrian and Cyclist Delay; and • Accidents and safety on local highway network.
	Completed Development:

Scoped in Topics	Potential Effects Scoped in
	• Severance; • Driver delay on local highway network; • Accidents and safety on local highway network; and • Change in public transport trips.
Noise and Vibration	Demolition and Construction: • Effects due to demolition and construction noise • Effects due to changes in road traffic noise levels during demolition and construction
	Completed Development: • Effects due to changes in road traffic noise during completed development • Effects due to noise from new fixed plant installations
Underwater Noise	Demolition and Construction: • Significant but temporary increase to underwater noise may impact marine mammals and fish. This is most relevant to underwater noise generated by piling activities and in removal of rock substrate to deepen new berths but will also include some generation of underwater noise by vessels required during the construction process.
	Completed Development: • Potential increase to underwater noise generated by maintenance dredging activities that will be required to maintain depth at the berths and manoeuvring areas; and • Potential increases to underwater noise generated by increased vessel movements due to increased capacity at the port.
Air Quality	Demolition and Construction: • Dust deposition and elevated PM_{10} concentrations; • Significant increase NO_2, PM_{10} and $PM_{2.5}$ concentrations from road traffic and vessel emissions; • Significant increase in NO_x concentrations leading to nitrogen and acid deposition; and • Increase in odour from dredging.
	Completed Development: • Significant increase NO_2, PM_{10} and $PM_{2.5}$ concentrations from road traffic and vessel emissions; and • Significant increase in NO_x concentrations leading to nitrogen and acid deposition.
Climate Change	Demolition and Construction: • GHG emissions associated with demolition of the existing structures onsite and construction of the proposed
	Completed Development: • Additive effect that climate and climate change may have on impacts identified by other technical disciplines as a result of the proposed development. • GHG emissions associated with the operation of the proposed development. This includes emissions from unregulated energy demands (including plug-in systems, ventilation, air conditioning and lighting) and regulated energy demands, including heating, cooling, domestic hot water, auxiliary power and lighting.

Scoped in Topics	Potential Effects Scoped in
Material Resources and Waste	Demolition and Construction: • Depletion of Landfill Void

Landscape, Seascape and Visual Amenity	Demolition and Construction:
	• Potential contribution to temporary effects for landscape, seascape, and visual receptors due to the following proposed development elements:
	  ○ Extension to Queen's Wharf
	  ○ Northern Wharf suspended deck
	  ○ Removal of Northern Arm
	  ○ New Western Wharf
	  ○ Pocket dredging

	Completed Development:
	• Potential contribution to permanent or long-term effects for landscape, seascape, and visual receptors due to the following proposed development elements:
	  ○ Extension to Queen's Wharf
	  ○ Northern Wharf suspended deck
	  ○ Removal of Northern Arm
	  ○ New Western Wharf

Socioeconomics	Demolition and Construction: • Local employment through construction (direct construction jobs created, net additional FTE jobs by area) • Indirect impact of construction works in the local economy
	Completed Development: • Additional direct revenue to port-based businesses, related to the expansion of cargo activity • Additional direct revenue to port-based business related to FLOW • Additional direct revenue to port-based business from cruise ships • Additional spend by cruise passengers and crew in terms of local and regional tourism • Additional tourism employment through cruise visitors • Additional employment by A&P Falmouth and other port-related businesses

25.1.6 Following submission of this Scoping Report, the project design, planning and EIA will be progressed, including:

- scoping consultation feedback which would be used to refine the scope of surveys and assessments, and to inform the ES;
- continued data collation, and where applicable field surveys;
- continued stakeholder engagement;
- ongoing design development; and
- preparation of the ES, which will be submitted with the application for development consent.

25.1.7 The final ES would be expected to include the following:

- Non Technical Summary: Summarising the main elements of the Project and the significant environmental effects identified through the EIA process. It would be written in plain English for a non technical audience.
- Volume 1 Main Text: The Main Text would detail the findings of the EIA. The ES would include a summary of the Scoping Opinion and consultation feedback. The proposed layout of the ES is provided in Appendix 3 of this report.
- Volume 2 Appendices: All technical documents referred to within Volume 1 would be reproduced here along with accompanying reports or documents to support Volume 1.

25.2 Proposed Content and Format of Environmental Statement

25.2.1 The specified information to be included in the ES of the proposed development will comply with the relevant legislation and EIA Regulations. A summary of the proposed structure of the ES is provided in Figure 4-1.

APPENDIX 1
RANGE AND SCALE OF EFFECTS

Table 1: Range of Effects

Effect	Example
Adverse	Detrimental or negative effect to an environmental resource or receptor
Neutral	An effect that on balance, is neither beneficial nor adverse to an environmental resource or receptor OR an effect that is equally beneficial and adverse to an environmental resource or receptor[107]
Beneficial	Advantageous or positive effect to an environmental resource or receptor.
Direct	Direct effects are those which arise as a direct consequence of a project action, e.g., the loss of habitat or the run-off of surface water to a watercourse
Indirect (secondary)	Indirect effects include, for example, the decline in the abundance of a species as a result of the loss of habitat or the damage to aquatic vegetation as a result of water pollution. Other common examples include the effect on air quality and ambient noise as a result of increased traffic flows
Cumulative	The combined effects of impacts
Intra	Effect of the project in combination of other reasonably foreseeable projects (refer to Cumulative Effects section later in this chapter)
Inter	Effect of the project in combination with each other on the same receptor (refer to Cumulative Effects section later in this chapter)
Long term	10 years +
Medium term	5-10 years
Short Term	up to 5 years
Reversible	Capable of being reversed so that the previous state or situation is restored
Irreversible	Permanent

Table 2: Scale of Effects Matrix

Magnitude of Impact	Sensitivity/Value of Receptor		
	Low	Medium	High
Unknown	-	-	-
Low	None	Negligible	Minor
Medium	None – Negligible	Minor	Moderate
High	Minor	Moderate	Major

107 In respect of the TVBHIA it is possible for Neutral residual effects to be classed as 'significant' for situations in which the 'net equation' of beneficial and adverse impacts considered together results in an overall effect which is neither beneficial or adverse on balance (e.g. due to their guidance, a townscape and visual impact assessment can result in a 'moderate neutral' effect, which would be classed as 'significant').

APPENDIX 2
PROPOSED CUMULATIVE SCHEMES

None identified.

APPENDIX 3
CONTENT OF ENVIRONMENTAL STATEMENT

Section	Content Summary
Non-Technical Summary (NTS)	A summary of the information provided in the ES.
Chapter 1 Introduction	The purpose and layout of the ES, the planning context, and the relevant experience and or qualifications of the experts who have prepared the ES.
Chapter 2 Process and Methodology	The legislative framework, provides details of scoping outcomes, outlines the assessment methodology, and details of the cumulative schemes that will be considered;
Chapter 3 Alternatives	Provides a description of the reasonable alternatives studied by the applicant as relevant to the proposed development (e.g., implementing the consented development), and the reasons for the selection of the chosen option, including a comparison of the environmental effects along with the reasons for the selection of the preferred option. Where applicable it will detail the evolution of the proposed development.
Chapter 4 Project Description	A description of the proposed development containing information on the physical characteristics and land use requirements of the proposed development during the demolition and construction works and the completed development and the main characteristics of the operational stage of the proposed development including energy demand, nature and quantity of the materials and natural resources used (water, land, soil and biodiversity).
Chapter 5: Demolition and Construction	The demolition and construction work of the proposed development and the key activities that would be undertaken during the works. Management controls that form part of the development proposals that would be implemented to avoid, minimise and where not possible, mitigate the magnitude of likely significant environmental effects.
Topic Chapters	Separate Chapters will be provided for each of the scoped in topics. To include: relevant aspects of the baseline and an outline of the likely evolution thereof without the implementation; factors of the environment likely to be significantly affected by the proposed development; the likely significant effects of the proposed development; mitigation; and residual effects.
Cumulative Effects	The following types of cumulative effects will be considered: Intra-Project effects of different types of impact from the proposed development on particular receptors at or surrounding the site. Potential impact interactions include the combined effects of noise, dust and visual impacts during construction of the proposed development on a particular sensitive receptor; and Inter-Project effects which are combined effects generated from the proposed development with other existing and/or approved developments. These other developments may generate their own individually insignificant effects but when considered together could amount to a significant cumulative effect, for example, combined townscape and visual impacts from two or more (existing and/or approved) developments.

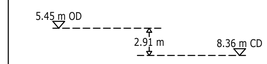
Section	Content Summary
Residual Effects	A summary of any significant residual effects, subsequent to implementation of mitigation.

APPENDIX 4
SUPPORTING APPENDICES

APPENDIX 4A: PROPOSED DEVELOPMENT CONCEPT DESIGN DRAWINGS, RAMBOLL 2022

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

KEY :-

- EXISTING LANDSIDE STRUCTURE TO BE DEMOLISHED
- OUTLINES OF PROPOSED NEW WHARF STRUCTURES
- EXISTING WHARF STRUCTURE TO BE DEMOLISHED
- PROPOSED NEW WHARF STRUCTURE

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	AP	GW	GW

PRELIMINARY

A&P FALMOUTH PORT EXPANSION

RAMBOLL

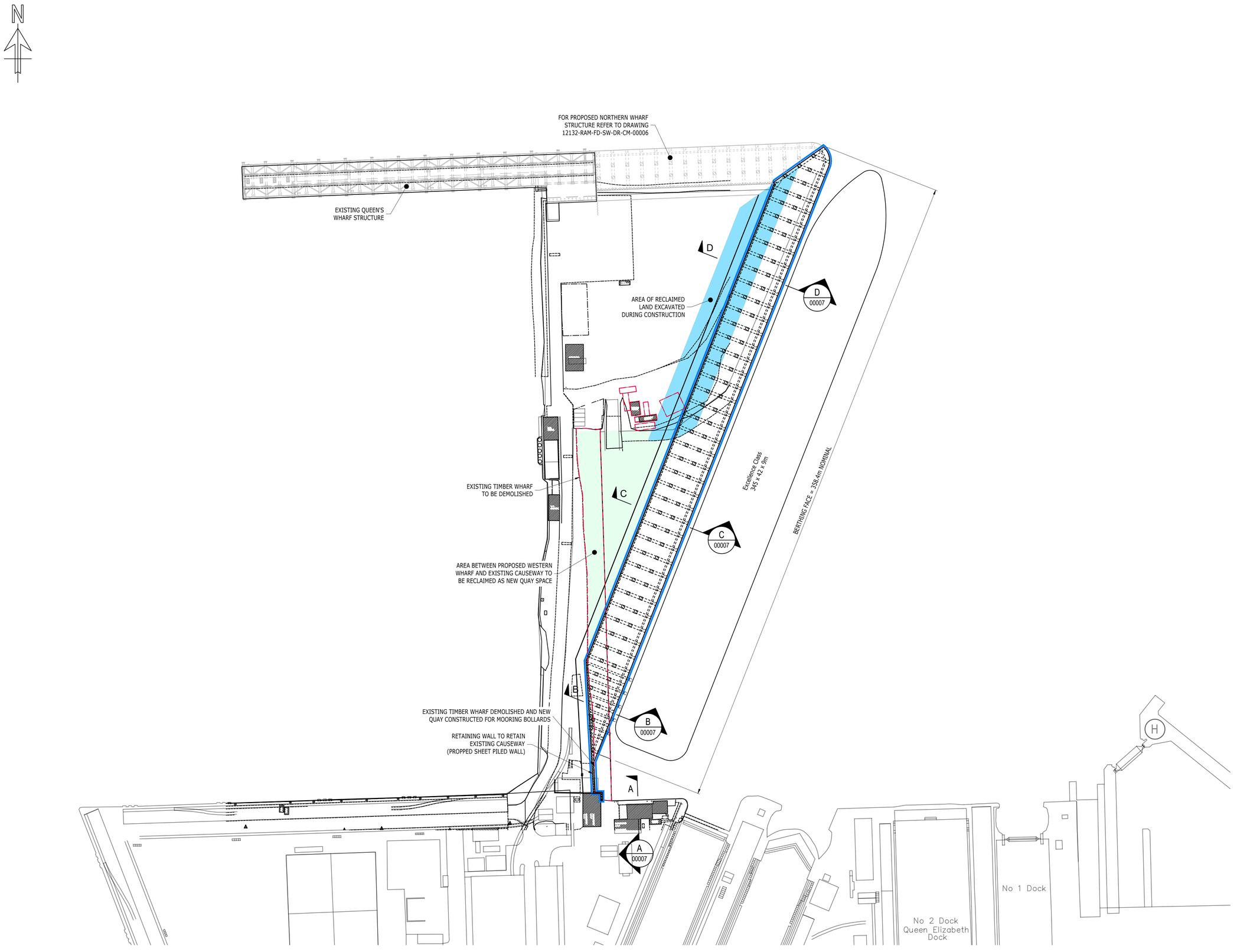
tel 023 8081 7500 southampton@ramboll.co.uk
www.ramboll.co.uk

CONCEPT DESIGN GENERAL ARRANGEMENT BERTH LAYOUT

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1000	AP	JULY 2022

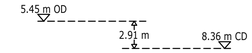
Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00002	PR01

13/12/2022 13:35:55



Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

KEY :-

EXISTING LANDSIDE STRUCTURE TO BE DEMOLISHED

OUTLINE OF PROPOSED NEW WESTERN WHARF STRUCTURE

Rev	Description	Date	By Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF AP	GW

PRELIMINARY

A&P FALMOUTH PORT EXPANSION

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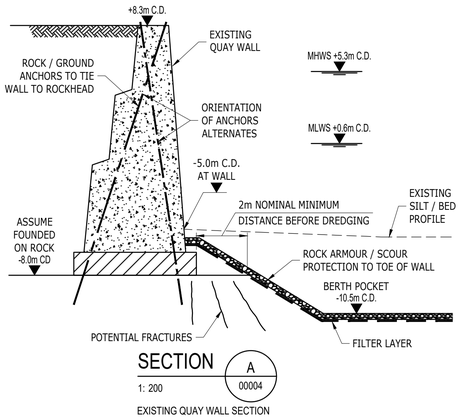
CONCEPT DESIGN GENERAL ARRANGEMENT WESTERN WHARF

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1000	AP	JULY 2022

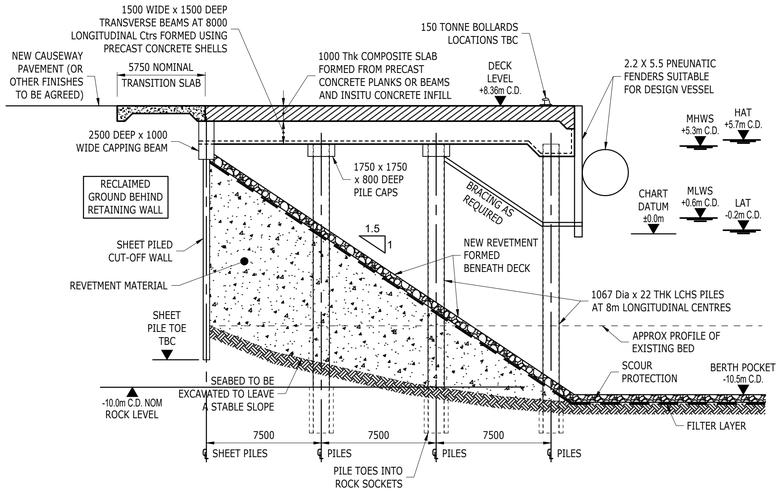
Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00003	PR01

13/12/2022 13:38:04

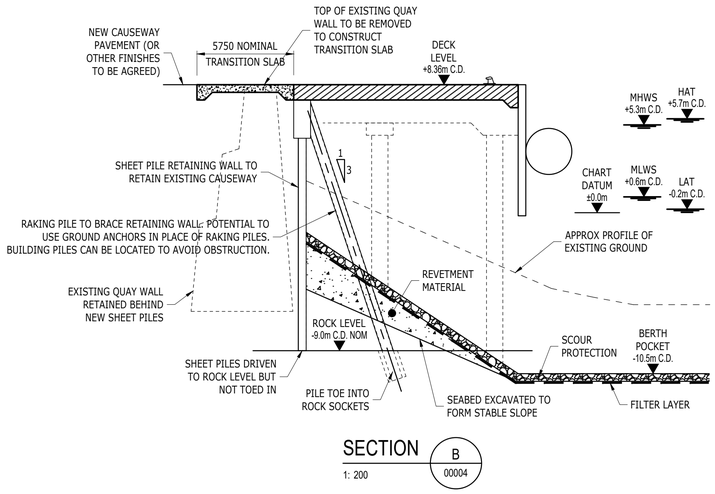


SECTION A
1: 200
00004

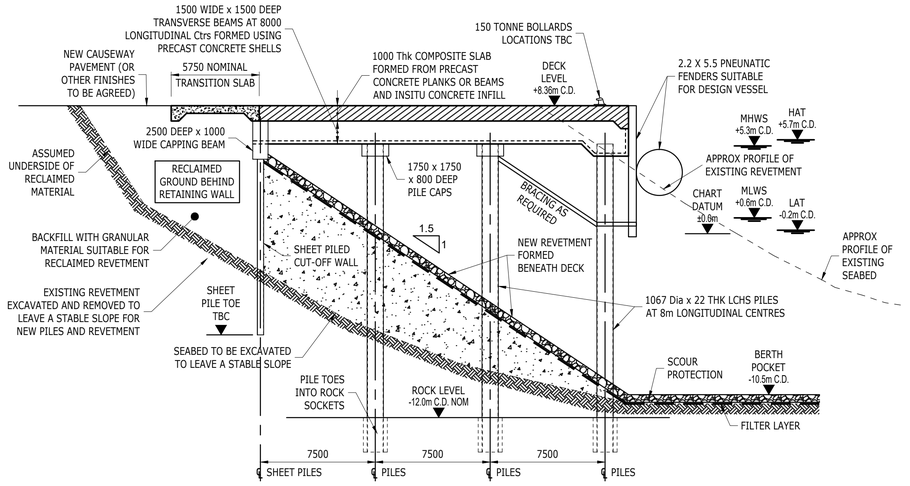
EXISTING QUAY WALL SECTION



SECTION C
1: 200
00004



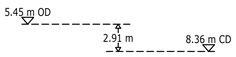
SECTION B
1: 200
00004



SECTION D
1: 200
00004

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

PRELIMINARY

A&P FALMOUTH PORT EXPANSION

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CONCEPT DESIGN SECTIONS WESTERN WHARF

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:200	SPF	AUG 2022

Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00004	PR01

13/12/2022 13:38:40

50m NOMINAL EXTENSION

Notes

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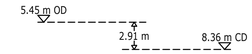
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

KEY :-

OUTLINE OF PROPOSED NEW QUEENS WHARF STRUCTURE

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

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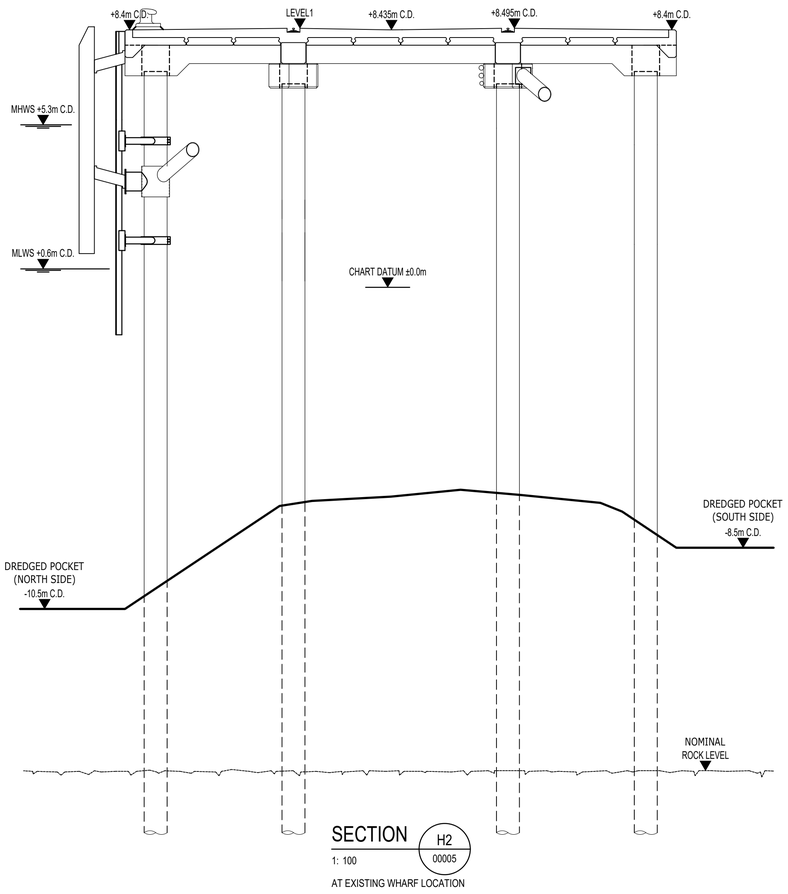
CONCEPT DESIGN
GENERAL ARRANGEMENT
QUEENS WHARF EXTENSION

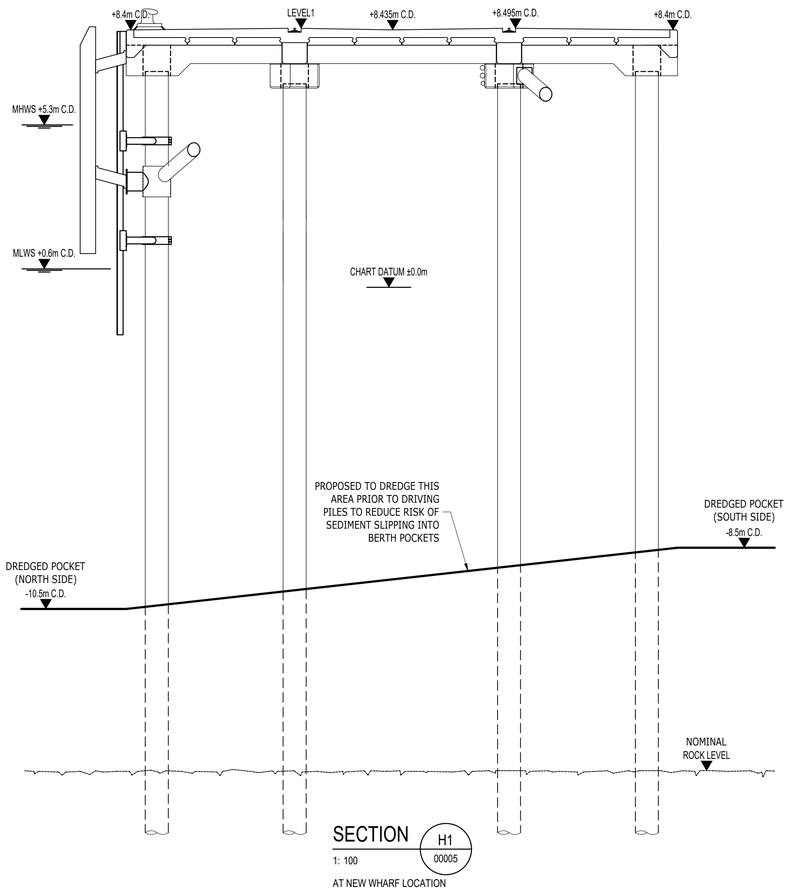
Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:250	SF	JULY 2022

Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00005	PR01

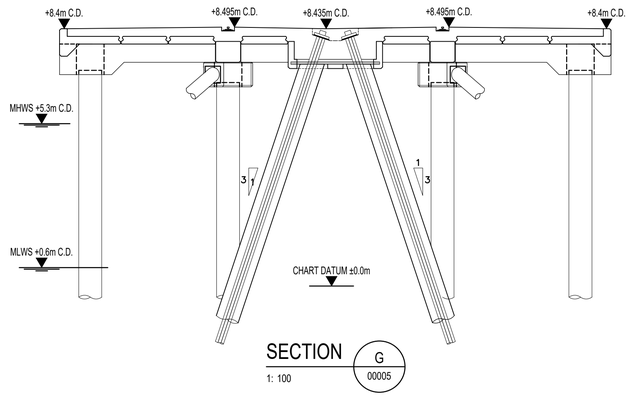
13/12/2022 13:43:12



SECTION H2 / 00005
1: 100
AT EXISTING WHARF LOCATION



SECTION H1 / 00005
1: 100
AT NEW WHARF LOCATION



SECTION G / 00005
1: 100

Notes

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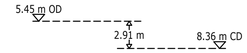
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

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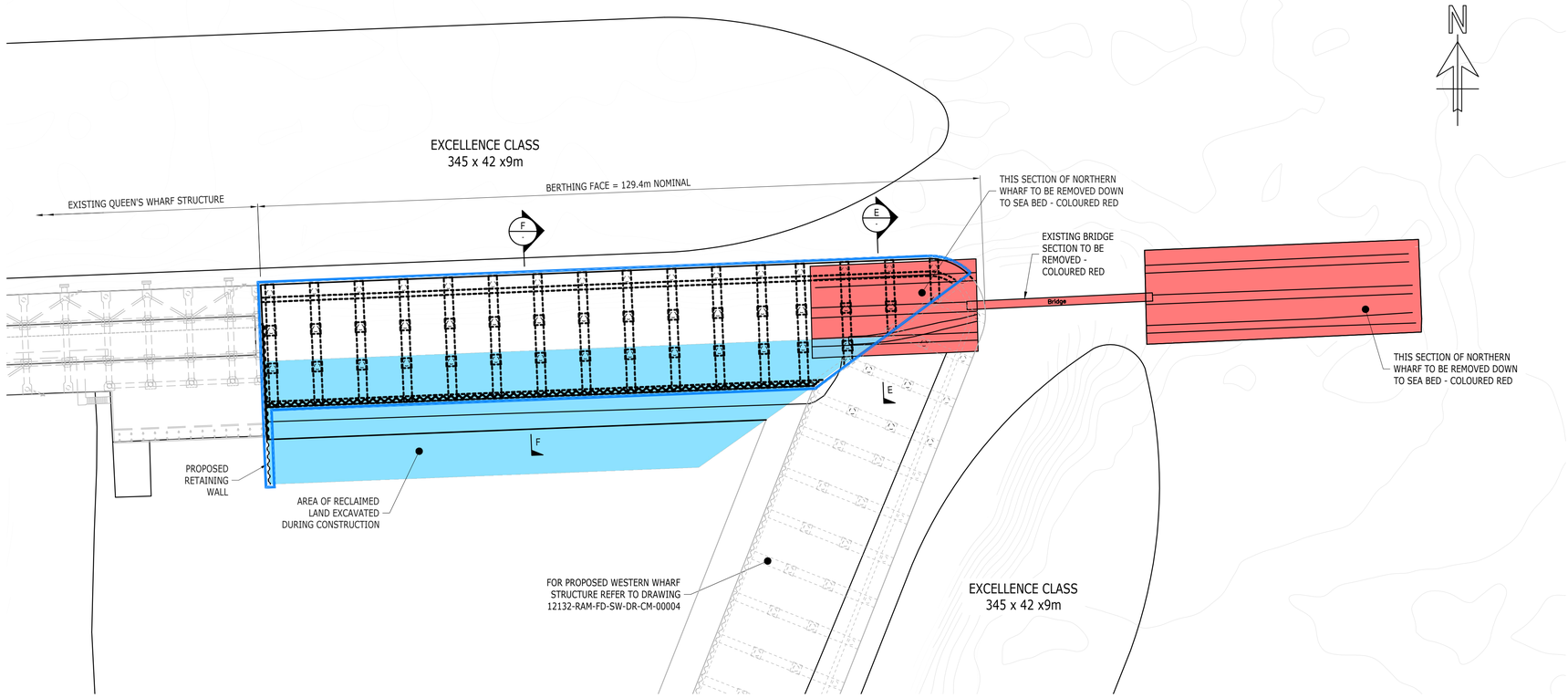
CONCEPT DESIGN SECTIONS QUEENS WHARF EXTENSION

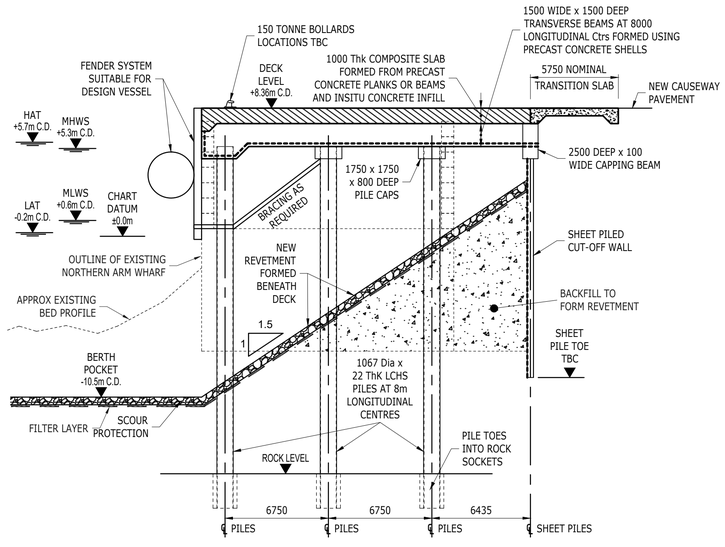
Project No:	Scale (@A1):	Drawn:	Date:
1620012132	AS NOTED	SF	JULY 2022

Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00006	PR01

13/12/2022 13:42:41



PLAN
1: 500

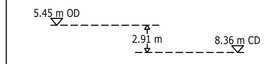


SECTION F
1: 200

TYPICAL NORTHERN WHARF SECTION

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

KEY :-

OUTLINE OF PROPOSED NEW NORTHERN WHARF STRUCTURE

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

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CONCEPT DESIGN GENERAL ARRANGEMENT NORTHERN WHARF INFILL

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	AS NOTED	SF	JULY 2022

Drawing No: 12132-RAM-FD-EA-DR-CM-00007

Rev: PR01

13/12/2022 13:45:00

Notes

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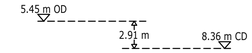
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.
4. ALL CO-ORDINATES ARE IN METERS U.N.O.
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

KEY :-

- EXISTING LANDSIDE STRUCTURES TO BE DEMOLISHED
- EXISTING LANDSIDE STRUCTURES TO BE RETAINED
- OUTLINES OF PROPOSED NEW WHARF STRUCTURE
- PROPOSED NEW WHARF STRUCTURE

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF AP		GW

PRELIMINARY

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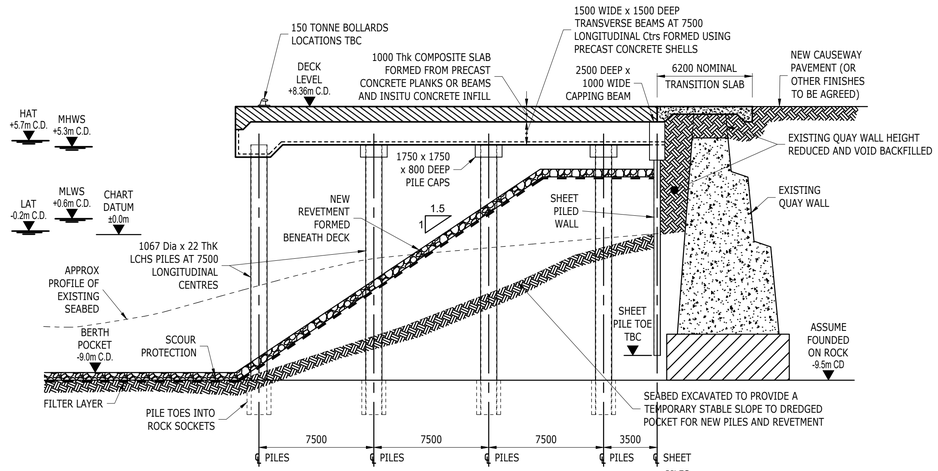
CONCEPT DESIGN GENERAL ARRANGEMENT FLOW WHARF

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1000	SPF	SEPT 2022

Drawing No: 12132-RAM-FD-EA-DR-CM-00008 Rev: PR01

13/12/2022 13:47:46



SECTION A 00010

1: 200

TYPICAL WHARF SECTION

Notes

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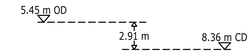
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



TIDAL LEVELS

TIDAL LEVEL DESCRIPTION	ABBREVIATION	LEVEL
HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

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PORT EXPANSION

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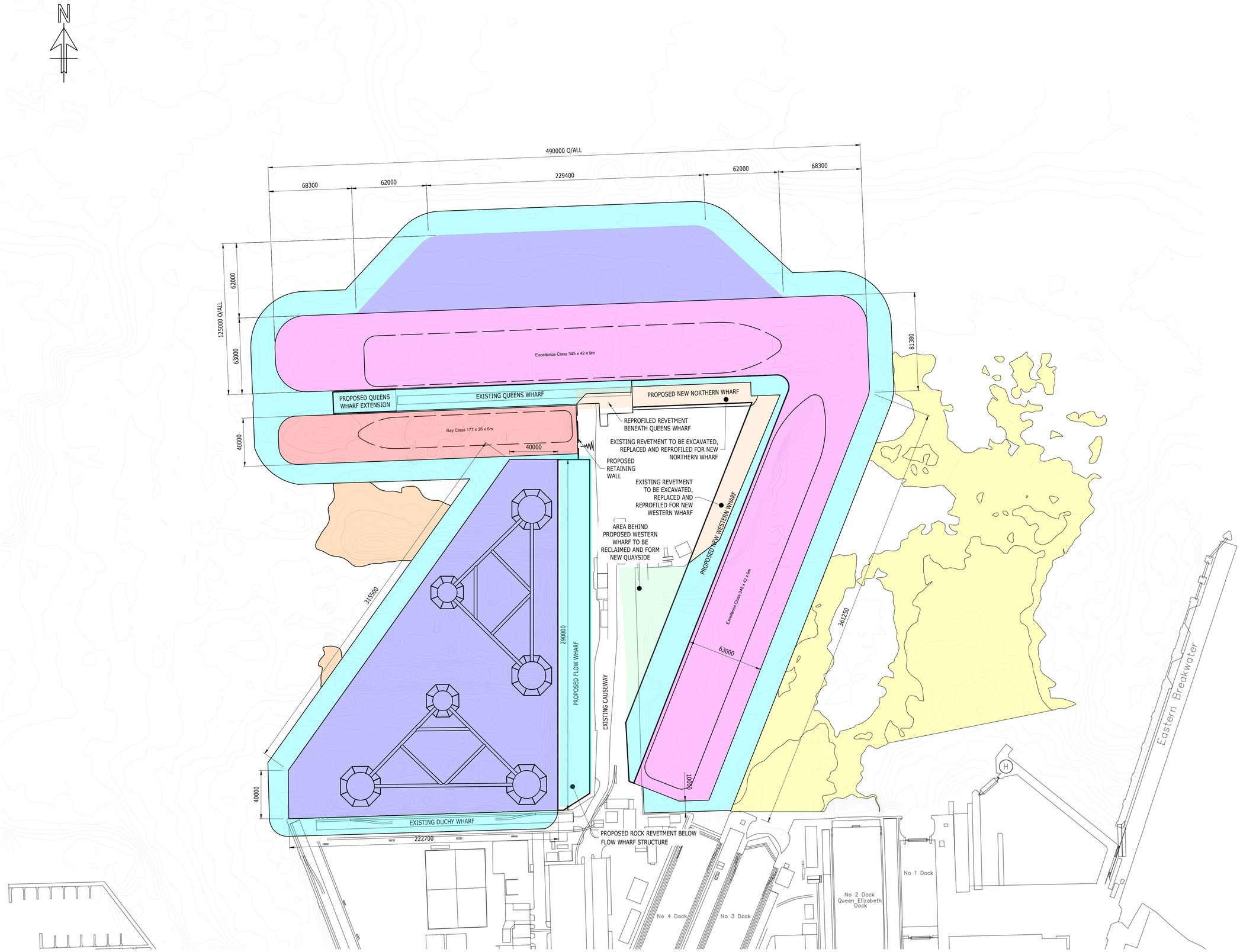
CONCEPT DESIGN SECTIONS FLOW WHARF

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:200	SPF	SEPT 2022

Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00009	PR01

13/12/2022 13:49:31



Notes

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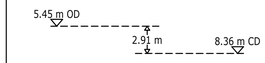
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
MEAN SEA LEVEL	MSL	+3.00m C.D.
MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

Dredge to -10.5m CD:
55,503m^2
229,847m^3

Dredge to -10.5m CD for FLO W:
59,960m^2
223,745m^3

Dredge to -10.5m CD for Bay Class:
9,810m^2
32,945m^3

Graded sides:
55,045m^2
122,506m^3

Remove obstructions from demolished timber jetty -6.0m CD:
5,501m^2
6,051m^3

Surface skim to maintain -5.5m CD:
46,653m^2
26,646m^3

- The port layout is under development and there are a number of known issues.
- The dredge area shown is based on the concept design in progress.
- Volumes shown are approximate and are based on an average depth to each contour area.
- Dredge depths noted are to the clear draught of the design vessel + 1m underkeel clearance + 300mm siltation allowance.
- Scour protection required at additional depth.

Rev	Description	Date	By	Chk	App
PR02	DREDGE DEPTH REVISED	20/04 2023	SPF	AP	GW
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

PRELIMINARY

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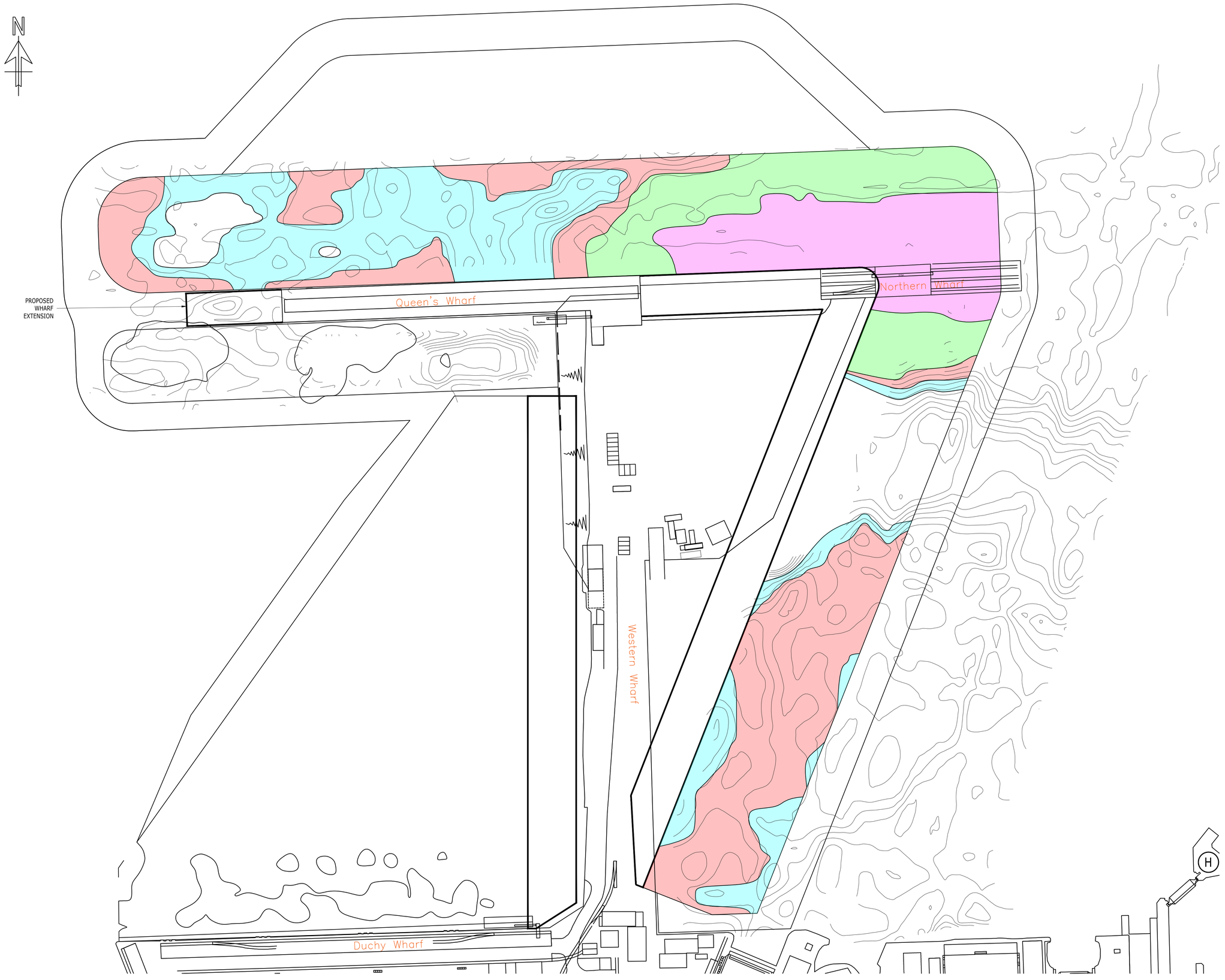
CONCEPT DESIGN GENERAL ARRANGEMENT DREDGE PLAN

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1500	SPF	SEPT 2022

Drawing No:	Rev:
12132-RAM-FD-EA-DR-CM-00010	PR02

20/04/2023 07:49:39



Notes

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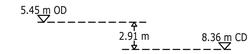
5. ALL LEVELS ARE IN METRES ABOVE CHART DATUM U.N.O.
6. FOR THE RELATIONSHIP BETWEEN THE CHART DATUM AND ORDNANCE DATUM REFER TO THE DIAGRAM BELOW:



HIGHEST ASTRONOMICAL TIDE	HAT	+5.70m C.D.
MEAN HIGH WATER SPRINGS	MHWS	+5.10m C.D.
MEAN HIGH WATER NEAPS	MHWN	+4.10m C.D.
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MEAN LOW WATER NEAPS	MLWN	+1.80m C.D.
MEAN LOW WATER SPRINGS	MLWS	+0.50m C.D.
LOWEST ASTRONOMICAL TIDE	LAT	-0.20m C.D.

7. ROCKHEAD LEVELS AND CONTOURS SHOWN BASED ON SHORELINE SURVEYS LTD DRAWING - J2103 02/02.

DEPTH OF ROCK TO BE REMOVED = 4m TO 3m

DEPTH OF ROCK TO BE REMOVED = 3m TO 2m

DEPTH OF ROCK TO BE REMOVED = 2m TO 1m

DEPTH OF ROCK TO BE REMOVED = 1m TO 0m

Rev	Description	Date	By	Chk	App
PR01	PRELIMINARY ISSUE	14/12 2022	SPF	AP	GW

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CONCEPT DESIGN GENERAL ARRANGEMENT DEPTHS OF ROCKHEAD TO BE DREDGED

Project No:	Scale (@A1):	Drawn:	Date:
1620012132	1:1000	SPF	SEPT 2022

Drawing No: 12132-RAM-FD-EA-DR-CM-00011

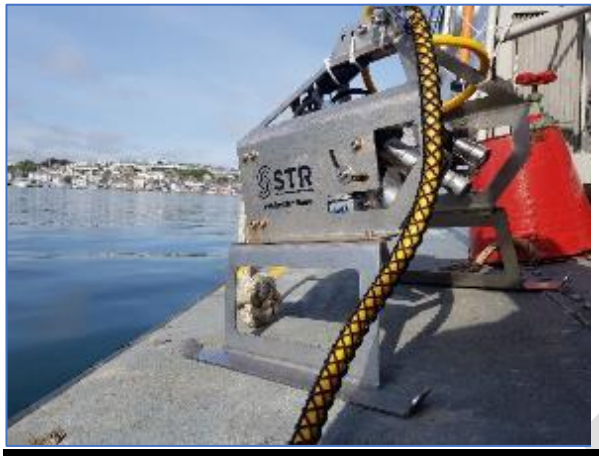
Rev: PR01

13/12/2022 13:55:50

APPENDIX 4B: DROP-DOWN VIDEO SURVEY REPORT FOR THE PORT OF FALMOUTH, CORNWALL, CARCINUS 2022

Falmouth Docks & Engineering Company

Drop-Down Video (DDV) Survey Report for the Port of Falmouth, Cornwall



Carcinus Reference: J0654/22/05/23

23 June 2022

Version 2.0

Carcinus Ltd – Document Control Sheet

Client	Ramboll UK Ltd. On behalf of Falmouth Dock & Engineering Company
Project Title	Falmouth DDV Survey
Document Title	Drop-Down Video (DDV) Survey Report for the Port of Falmouth, Cornwall
Document Number	J0654/22/05/23
Revision	2.0
Date	23 June 2022

Revisions

Revision No.	Date	Comment
0.1	**20 June 2022**	**Internal Draft**
1.0	**21 June 2022**	**External Draft**
2.0	**23 June 2022**	**Final Draft**

Document QA and Approval

	Name	Role	Date
Author	Joshua Baker	Marine and Freshwater Ecologist	23 June 2022
Checked	Matthew Crabb	Director	23 June 2022
Approved	Matthew Crabb	Director	23 June 2022

This report was produced by Carcinus Ltd on behalf of Ramboll UK Ltd. for the purposes of providing a Drop-Down Video survey report to support ongoing consultations with regulators with respect to the planning of subsequent intrusive and more selective sampling. Every effort has been made to ensure the information contained within is as complete and valid as possible at the time of writing. It should be noted that additional information may have existed at the time of publication of this report that was not available, not identified or has subsequently been published after the date of this report.

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1 Introduction

Ramboll UK Ltd commissioned Carcinus Ltd (Carcinus) on behalf of Falmouth Docks & Engineering Company (the 'Client) to undertake a high-level Drop-Down Video (DDV) survey in the vicinity of the Port of Falmouth and approach channels (the survey area).

The client is exploring proposals to develop the Port of Falmouth, which would include dredging around the Queen's Jetty and the Western Wharf. These works would require a Marine Licence from the Marine Management Organisation (MMO) and planning permission under the Town and Country Planning Act, both of which would be supported by an Environmental Impact Assessment (EIA). The client has entered into discussions with Natural England with regard to agreeing a scope for benthic surveys to inform these assessments/licences, and the survey reported on in this document was designed to confirm the presence/absence of maerl (typically *Phymatolithon calcareum* or *Lithothamnion glaciale*) habitat and other habitats / biotopes in the survey area to facilitate planning of these future surveys.

Accordingly, this document presents the survey methods used, the data collected and gives a characterisation of the benthic environment within the survey area in terms of the seabed habitats and associated biological epibenthic communities. No infauna sampling was undertaken during this initial survey.

1.1 Objectives

The specific objectives of this report are as follows:

- Provide detail of the survey operations associated with the data collection phase of the study;
- Outline the methods and procedures used to analyse the data;
- Detail the results of the study, including assigning biotopes to the surveyed areas, where possible; and
- Summarise the benthic habitats of the area with specific reference the distribution of maerl habitats in the vicinity of the proposed development.

2 Methodology

2.1 Survey Strategy

The survey strategy was designed by Carcinus in agreement with Ramboll. The Health, Safety and Environmental (HSE) aspects of the works were also considered and planned. As part of this process, a detailed Project Execution Plan was complied, which included emergency planning, consideration of environmental conditions and project specific tasks.

Prior to this survey, an acoustic survey of the Port and surrounding area was undertaken by Shoreline Surveys Ltd., which generated bathymetric, side scan sonar (SSS) and multibeam backscatter data. Sampling transects were positioned throughout the survey array so as to cover habitat boundaries visible in the multibeam backscatter data, and, where no visible boundaries occurred, provide representative coverage of the survey area.

2.2 Vessel Specifications and Positioning

All survey operations were undertaken on board the vessel 'Ship Triton', details of which are provided in Table 2.1. The vessel is a Port Tender used by A&P Falmouth for various port operations but operates under the MECAL Cat 2 (60 nm from a Safe Haven). Mobilisation and demobilisation took place from the Port of Falmouth.

Table 2.1 Survey vessel Triton and summary of technical specifications.

MV Triton	Technical Specification	
	Overall length:	14.3 m
	Beam:	4.5 m
	Max Draught:	1.4 m
	Maximum Speed	16 knts

Site positioning was achieved using a differential GPS / GNSS system providing positional information to a computer running Trimble HYDROPro™ Navigation. No positional offsets were applied to the GNSS system antenna as the antenna was situated <1 m from the deployment location of the survey equipment. Positional information was applied to the video overlay for the DDV system. All information was logged and appropriately stored in redundant storage and secured offsite after survey operations each day. All coordinates were recorded in Latitude/Longitude (WGS 1984).

2.3 Sampling Techniques

A summary of the technique used to capture seabed imagery is summarised below.

DROP-DOWN VIDEO	
Equipment	Equipment used to capture digital video and stills of the seabed consisted of the following apparatus: • STR Seaspyder Nano drop camera system featuring: - 1/2.5" Aptina 5 Megapixel CMOS Sensor - Real time video - LED lamps - Dual lasers for scale - Surface control unit and processor for recording and viewing live feed and • HYDROpro™ Navigation software for recording positions and vessel and equipment tracks – accounting for positional offsets; and • Differential (d)GNSS for positional accuracy to < 50 cm
Deployment and recovery	All DDV operations were undertaken in accordance with our in-house standard operating procedures. The deployment and recovery procedures for the apparatus are outlined below: • As part of the mobilisation process the system was fully tested on deck and in the water to ensure correct functionality;

	• Prior to deployment, the distance between the lasers was measured to the nearest millimetre (see below) and the text overlay updated to reflect date, time, position and station; • The vessel orientated into the most appropriate direction to enable low survey speeds coupled with vessel manoeuvrability; • Once the vessel was approximately 25 m from the SOL the DDV was powered up and deployed from the side of the vessel to give enough run-in to ensure the entire transect was recorded; • The tether was paid out until the operator could see the seabed via the live feed on the surface. The tether was then continually adjusted to account for changes in the bathymetry; • Once at depth, recording / positional fixing began as the vessel moved along the transect; and • At the end of the transect the recording was stopped, the system powered down and recovered to deck. **Laser measurements:** • 10 cm
Sample acceptance criteria	Data was live streamed to the vessel allowing the on board Carcinus ecology team to assess the quality of the footage in real time. Upon completion of each transect the video footage was reviewed and backed up on to triplicate redundant data storage. It would have been necessary to repeat the transect should there have been a problem with the data e.g. file corruption.
Data collection method	The general method for the delivery of DDV surveying was based on JNCC Procedural Guideline No. 3-5 Identifying biotopes using video recordings (Holt & Sanderson, 2001) Transects were orientated to run in whichever direction provided best coverage over the identified habitat boundary. The SOL and orientation was constrained by the safe operation of the vessel in relation to tidal flow, windage, water depth and room to manoeuvre. The DDV system was deployed with the camera mounted at 45° to produce an oblique image of the seabed. This gave depth to the image to assess the dimensions of the seabed features. Scale was determined by the in-shot dual lasers. The position and depth of the DDV system was monitored in real-time via the output from the dGNSS augmented by the live camera feed. Continuous video recording was made as the DDV system was 'flown' along the transect with the video being geo-referenced.

2.4 Data Analysis

Digital video data were reviewed using an office-based editing suite to provide qualitative assessments of the habitats and epibenthic communities present. Representative static images were selected from each transect to derive information on species composition and sediment types. Indicative stills have been included within the report and are presented in full in the zip file provided with this report.

3 Survey Operations

Survey operations took place on 04 and 05 May 2022. A summary of operations across both survey days is presented in Table 3.1.

Table 3.1 Summary of survey operations.

Date/Time (BST)	Activity
04/05/2022 10:00	Mobilise all equipment to vessel
04/05/2022 11:24 ↓ 04/05/2022 16:36	Conduct survey operations (day 1 of 2): DDV1, DDV2, DDV3, DDV9, DDV4, DDV5, DDV7, DDV7a, DDV13, DDV15, DDV17, DDV27, DDV28, DDV30, DDV23, DDV25, DDV21, DDV24
04/05/2022 17:00	Disembark vessel
05/05/2022 09:00	Embark vessel
05/05/2022 09:36 ↓ 05/05/2022 10:58	Conduct survey operations (day 2 of 2): DDV11, DDV29, DDV20, DDV18, DDV19, DDV26
05/05/2022 11:30	Demobilise all equipment from vessel

There were no accidents or near misses to report with all survey activities adhering to the health and safety plan and accompanying risk assessments, provided in the Carcinus referenced document: J0654/22/04/29 Ramboll Falmouth DDV Survey HSE Plan.

The start/end coordinates and geographical positions of each transect are presented in Table 3.2 and Figure 3.1 respectively. Due to operational constraints on site, and the apparent homogeneity of seabed habitats in the near vicinity, 6 no. of the planned transects (DDV6, DDV8, DDV10, DDV12, DDV14 and DDV16) were not surveyed. The heading followed for each transect was chosen based on wind, wave, tide and other environmental conditions during survey operations.

Table 3.2 Target vs. Actual starting and finishing for each DDV Transect.

Transect No.	Planned				Actual			
	Start		End		Start		End	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
DDV_1	50.15914	-5.06298	50.159187	-5.061568	50.159014	-5.063424	50.158931	-5.061611
DDV_2	50.15853	-5.063193	50.158141	-5.062005	50.158587	-5.063112	50.158082	-5.061601
DDV_3	50.15659	-5.063027	50.156657	-5.061659	50.156634	-5.063064	50.156129	-5.061204
DDV_4	50.15557	-5.062933	50.155554	-5.061532	50.155769	-5.063402	50.154992	-5.062107
DDV_5	50.15492	-5.062626	50.15495	-5.061241	50.154820	-5.062414	50.154792	-5.061031
DDV_6	50.15356	-5.061558	50.15446	-5.061378	Decision taken not to complete			
DDV_7	50.15307	-5.060659	50.153965	-5.060716	50.152928	-5.061063	50.152777	-5.061070
DDV_7a					50.153216	-5.060835	50.154004	-5.060404
DDV_8	50.15433	-5.060586	50.154364	-5.05923	Decision taken not to complete			
DDV_9	50.15629	-5.060501	50.155773	-5.059362	50.156695	-5.060413	50.155989	-5.059028
DDV_10	50.15813	-5.058728	50.159008	-5.058798	Decision taken not to complete			
DDV_11	50.15813	-5.055956	50.159027	-5.056041	50.158094	-5.055811	50.159247	-5.055201
DDV_12	50.15893	-5.051806	50.159253	-5.050524	Decision taken not to complete			
DDV_13	50.15557	-5.05463	50.155529	-5.053241	50.155617	-5.054597	50.155598	-5.053355
DDV_14	50.15472	-5.054842	50.154982	-5.053515	Decision taken not to complete			
DDV_15	50.15469	-5.05204	50.155532	-5.052443	50.154730	-5.051917	50.155516	-5.051544
DDV_16	50.15516	-5.050404	50.155897	-5.051221	Decision taken not to complete			
DDV_17	50.15621	-5.049868	50.156231	-5.048441	50.156208	-5.049832	50.156116	-5.048374
DDV_18	50.1612	-5.04086	50.161225	-5.039461	50.161390	-5.040654	50.160919	-5.039408
DDV_19	50.15974	-5.039521	50.160308	-5.038423	50.159543	-5.039483	50.159858	-5.038350
DDV_20	50.15894	-5.041948	50.158512	-5.040703	50.159060	-5.041529	50.158121	-5.041718
DDV_21	50.15785	-5.038505	50.158444	-5.037478	50.158688	-5.037812	50.158075	-5.039009

Transect No.	Planned				Actual			
	Start		End		Start		End	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
DDV_22	50.15619	-5.035067	50.156213	-5.033668	Decision taken not to complete			
DDV_23	50.15504	-5.036828	50.154459	-5.035741	50.154292	-5.035368	50.155305	-5.036139
DDV_24	50.16086	-5.036245	50.160914	-5.034848	50.16085	-5.034709	50.160861	-5.036374
DDV_25	50.15772	-5.033694	50.157761	-5.032282	50.158232	-5.032160	50.158641	-5.033759
DDV_26	50.15834	-5.035525	50.159197	-5.035146	50.158053	-5.035806	50.158354	-5.035281
DDV_27	50.15827	-5.049663	50.157628	-5.04867	50.158604	-5.049511	50.158342	-5.047410
DDV_28	50.15737	-5.046064	50.156724	-5.045084	50.157286	-5.046378	50.158085	-5.044692
DDV_29	50.15926	-5.045722	50.158631	-5.044757	50.159277	-5.045710	50.158125	-5.044838
DDV_30	50.15704	-5.042486	50.157054	-5.041073	50.156671	-5.041363	50.156556	-5.042776

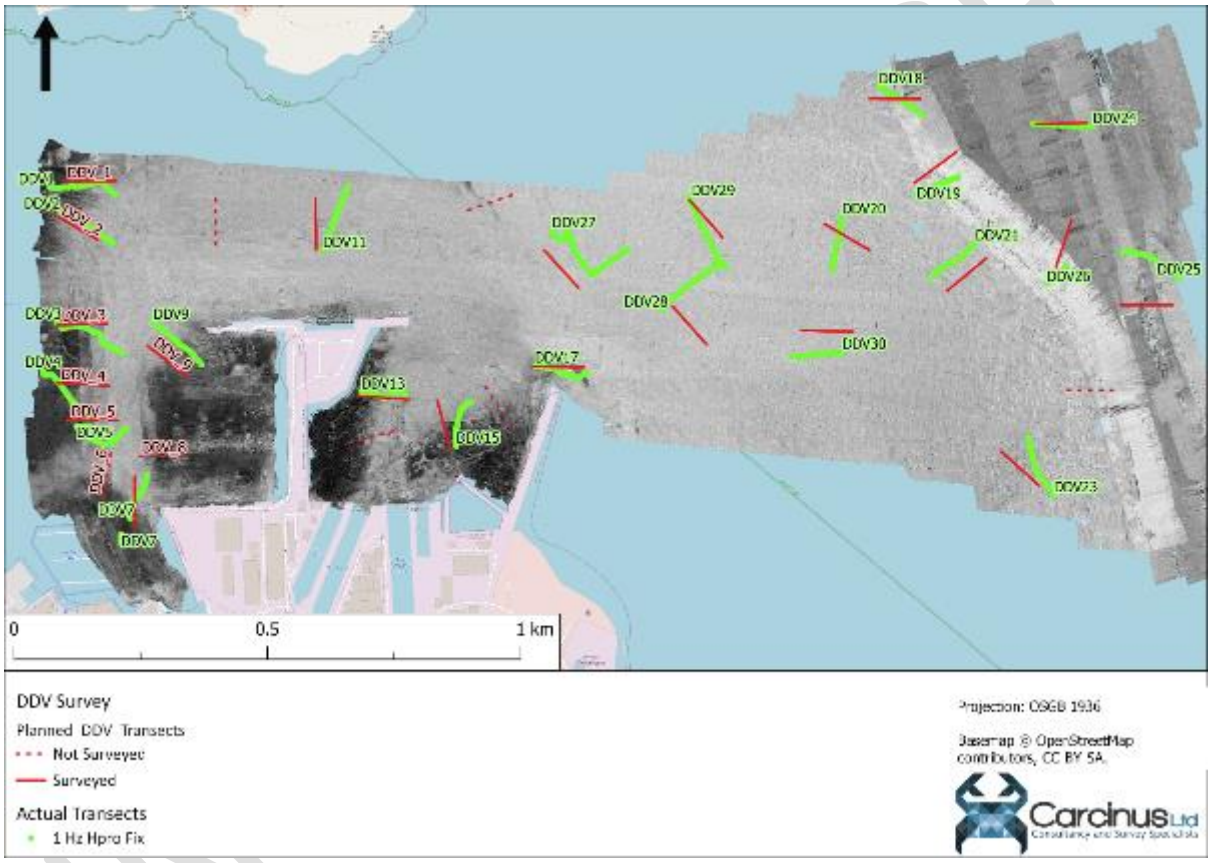


Figure 3.1 Planned vs. Actual DDV transects, overlaid on multibeam backscatter imagery.

4 Results

4.1 Biotopes

The results of the stills and video analysis are provided in a .zip file that accompanies this report. The distribution of biotopes along each of the transects is presented in Figure 4.1. A summary of each of the DDV transects, including notable species identified is presented in Table 4.1.

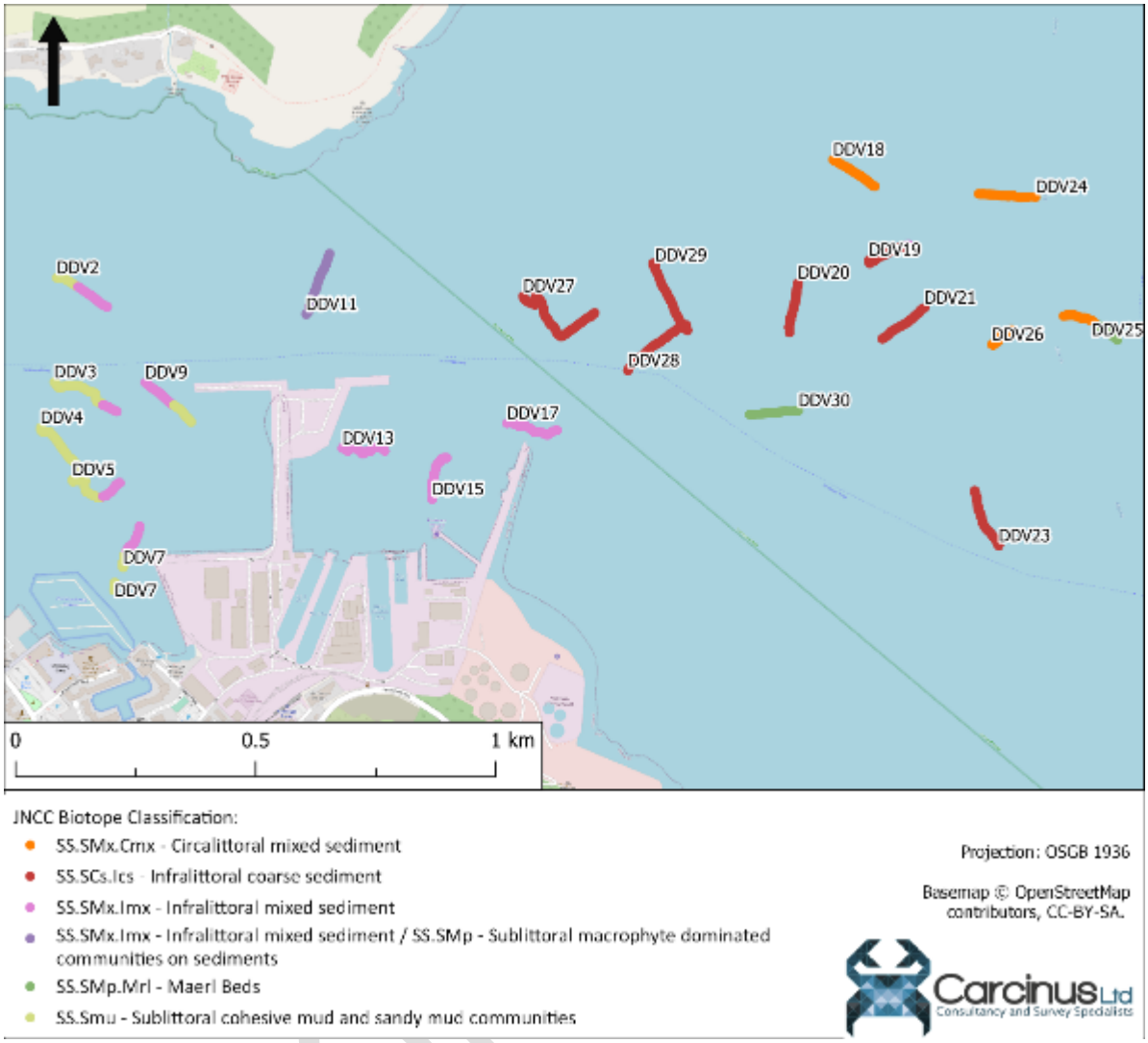


Figure 4.1 Biotopes along DDV transects surveyed within the Port of Falmouth and surrounding areas.

Table 4.1 Summary of findings of each DDV transect.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV1	SS.Smu Sublittoral cohesive mud and sandy mud communities / SS.SMx.Imx Infralittoral mixed sediment	Suberitidae; *Myxicola infundibulum*; Decapoda: Brachyura; *Sabella pavonina*; (suspected) *Cerianthys lloydii*	Sediment at start of transect consisted of lumpy soft mud. Some algae seen. Mixed sediment seen later on in transect, with evidence that silt-laden hard substrata became visible at the surface. Anoxic subsurface evident. Mud still very prevalent in mixed sediments.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV2	SS.Smu Sublittoral cohesive mud and sandy mud communities / SS.SMx.Imx Infralittoral mixed sediment	Branched orange sponge; *M. infundibulum*; *S. pavonina*, dead maerl (50.158093°N, 5.061659°W)	Soft mud and silt from start of transect. Surface scrapes indicate anoxic subsurface. Increased algal presence in second half of transect coincides with transition to mixed sediment. Some anthropogenic debris.
DDV3	SS.Smu Sublittoral cohesive mud and sandy mud communities / SS.SMx.Imx Infralittoral mixed sediment	*S. pavonina*; *M. infundibulum*; saccharina, teleostei, *Marthasterias glacialis*	High algal coverage at start of transect above soft mud. Anoxic subsurface. S. pavonina dominant fauna. Some anthropogenic debris and flecks of shell debris.
DDV4	SS.Smu Sublittoral cohesive mud and sandy mud communities	*S. pavonina*; *Calliactis parasitica*; *M. infundibulum*	Silty, with green algae at start of transect. Many *S. pavonina* at start of transect. Absence of algae later on in transect. Anoxic subsurface. Very occasional shell fragments.
DDV5	SS.Smu Sublittoral cohesive mud and sandy mud communities / SS.SMx.Imx Infralittoral mixed sediment	*S. pavonina*; *Saccharina latissima*; *M. infundibulum*; Paguridae; Teleostei; Scallop; Dead maerl (50.154595°N, 5.061342°W)	Soft mud and silt with limited algal cover. Shell fragments. Anoxic subsurface. Increasingly mixed sediment along transect. No clear zonation until mid-point of transect.
DDV7	SS.Smu Sublittoral cohesive mud and sandy mud communities	*S. pavonina*	Soft mud, silt, visible from the start with only limited algal cover. Surface scrapes reveal dark anoxic subsurface.
DDV7a	SS.Smu Sublittoral cohesive mud and sandy mud communities / SS.SMx.Imx Infralittoral mixed sediment	*S. pavonina*; Scallop; Subertidae; Sea Squirt; *M. glacialis*; *S. latissima*; *M. infundibulum*; orange sponge	Soft mud, silt, visible from the start with only limited algal cover. Surface scrapes reveal dark anoxic subsurface. Transition to mixed sediment midway through. Occasional patch of coarser sediment but within mixed sediment area. Fair numbers of sea squirt in the second half of the transect.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV9	SS.SMx.Imx Infralittoral mixed sediment / SS.Smu Sublittoral cohesive mud and sandy mud communities	*S. latissima*; *M. infundibulum*; Scorpaenidae; *S. pavonina*; Scallops; dead maerl; ***Styela clava***; Inachidae	The sedimentary habitat changes / transitions from fairly coarse mixed shelly muddy-sand / sandy-mud to less coarse more muddy-sand / sandy-mud with a more homogenous smoother surface. From this transition on we see more sea squirts and less shell debris at the surface. Throughout the transect but less so towards the end one of the most numerous / conspicuous species seen was the sabellid polychaete, *M. infundibulum*. There is a transition in the latter part of the transect. Here there are few macrofauna or fish to be seen. No coarse sediment is visible.
DDV11	SS.SMx.Imx Infralittoral mixed sediment / SS.SMp Sublittoral macrophyte-dominated communities on sediments	Sea squirts; dead maerl (50.158094°N, 5.055811°W); *S. pavonina*; *M. infundibulum*; *S. latissima*; *Lanice conchilega*; Live maerl (50.159234°N, 5.055210°W*); Necora puber*	Sediment well covered with green, brown and red algae throughout. Small patches of mud-sand / sand-mud visible between the coarser fraction composed of dead maerl. Numerous sea squirts with *Sabella* and *Myxicola* (the algal cover obscured much of the seabed). Some small examples of live maerl seen in the northern end.
DDV13	SS.SMx.Imx Infralittoral mixed sediment	*S. latissima*; dead maerl (50.155619°N, 5.054592°W); *M. infundibulum*; *S. pavonina*; Gobidae; Suberitidae; Sea squirt; Anemone; *N. puber*; scallop; scorpaenidae; *Cancer pagarus*	Sediment largely well covered with fine filamentous green algae, though not continual as for DDV11 (these algae covered areas with a 'lumpy' appearance). Large patches of bear sediment also seen. Clumps of Laminaria also seen (probably unattached). Dead maerl present but less than previously seen for DDV11 and more fragmented. Fairly continual scattering of dead scallop shells. Towards the end of the transect the sediment includes stones (gravel, pebble, some cobble). Then what appears to be clay appears (possibly evident earlier in the transect but hard to distinguish). The clay at the end of the transect is clearly bored.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV15	SS.SMx.Imx Infralittoral mixed sediment	*S. latissima*; Scallop; Dead maerl (50.154848°N, 5.051917°W); Anemone, *M. infundibulum*; *S. pavonina*; *Sabella spallanzanii*; Paguridae.	Numbers of live scallop at the start and a large clump of Saccharina / Laminariaceae (probably unattached; two further clumps observed). Live scallop seen throughout. Fair numbers of the unidentified small sabellid, dark fan, tube almost flush with sediment.
DDV17	SS.SMx.Imx Infralittoral mixed sediment	Gobiidae; *S. pavonina*; Sabellidae; Brachyura; Scallop	Seabed obscured by algae at start of transect. Some epifauna attached but variety of algal species suggests that most, if not all is unattached. Some anthropogenic debris (pipe/cable visible). Seabed muddy-sand later in transect, relatively bare in terms of faunal life
DDV18	SS.SMx.CMx Circalittoral mixed sediment	*C. lloydii*; *M. glacialis*; Brachyura; *M. infundibulum*; Scallop; Anemone; Orange sponge; *Goneplax rhomboides*; Elasmobranchii; Sea squirts; *N. puber*	Mixed sediment. Cerianthus lloydii very evident across the transect, sometimes up to 3 or 4 in a single frame. Possibly, this is the biotope 'SS.SMx.CMx.ClloMx Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment'. There is a lot of dead maerl seen at the start of the transect but by halfway through the transect as the depth increases it is much reduced as the amount of shell and mud increases. Scallops, and a range of crabs very evident and sea squirts common in the second half of the transect.
DDV19	SS.SCS.ICS Infralittoral coarse sediment / SS.SMx.Imx Infralittoral mixed sediment	*Spriobranchus* spp. (tubes); Scallop; *M. glacialis*; Gobiidae; *S. latissima*; *C. lloydii*	Coarse sediment formed into sediment waves, dead maerl across the peaks (50.159496°N, 5.039451°W). Spiny starfish frequently seen, some feeding. Many verenids amongst dead shells. Keel worms abundant in places. Depth increase in second half accompanied by shells covered in silt with dead maerl largely not evident. Fair numbers of scallop seen.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV20	SS.SCS.ICS Infralittoral coarse sediment	Dead maerl (50.159060°N, 5.041529°W); Brachyura; Orange sponge; Live maerl (50.158152°N, 5.041723°W)	Sediment waves clear with troughs filled with shell debris and peaks of largely bare dead maerl. Occasional small fragments of live maerl.
DDV21	SS.SCS.ICS Infralittoral coarse sediment	Dead maerl (50.158688°N, 5.037812°W); Live maerl (50.158684°N, 5.037828°W); Brachyura; *M. glacialis*; Anemone; Live maerl (50.158376°N, 5.038365°W); *Hyas* spp.	The sediment is coarse with a mixture of dead maerl, shell and gravel as well as a small amount of live maerl. Sediment waves are evident as on other outer transects but the accumulation of shells in the troughs is less evident during the first half of the transect (in places aggregations of shell material are seen). The spiny starfish, *M. glacialis*, is seen with some frequency. Midway through the transect an occasional larger piece of maerl is seen in the troughs. Towards the end of the transect the sediment wave feature is replaced by a bank of shells for a short distance before the sediment waves return as the transect ends.
DDV23	SS.SCs.Ics Infralittoral coarse sediment	Dead maerl (50.154292°N, 5.035368°W); *S. latissima*; Gobiidae; Scallop; *M. glacialis*; *Spirobranchus* spp.; Anemone	Coarse sediment waves from the start of the transect with shell debris collected in the troughs and peaks composed of dead maerl. Gradual loss of sediment waves such that by about halfway through the transect the waves are no longer discernible. This is then followed by an increase in pebble / cobble and Laminariaceae. There is a large patch of Laminariaceae, but from this point onwards they are very much in evidence reflecting the increase in the availability of larger hard substrata attachment points [pebble and cobbles] in the dead maerl and shell debris matrix. Another large patch of Laminariaceae in again encountered toward the end of the transect.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV24	SS.SMx.CMx Circalittoral mixed sediment	*M. glacialis*; Scallop; Teleostei; Brachyura; Bivalve siphons; *L. conchilega*; Burrowing anemone; *Spirobranchus* spp.	Depth, darkness and speed of travel meant that first clear view of sediment was almost halfway through the video. Sediment appears mixed/coarse, main fauna evident spiny starfish and scallops.
DDV25	SS.SMx.Mrl Maerl Beds / SS.SMx.CMx Circalittoral mixed sediment	Live maerl & dead maerl (throughout transect); Scallop; Inachidae	Seabed appears largely obscured by algal cover at the start of the transect but the camera then reveals a dense bed of live maerl. This dense bed has the occasional bare patch within it where live maerl does not dominate. Then, as the depth increases, a transition to circalittoral mixed sediment occurs where bare patches / dead maerl dominate and the live maerl fraction decreases greatly or is absent.
DDV26	SS.SMx.CMx Circalittoral mixed sediment	*M. glacialis*; *S. latissima*; Brachyura; Scallops; Elasmobranchi	Initially a lot of dead maerl present but this changes to a heavy cover of shell material which often obscures the view of the underlying mud and it is this which defines the remainder of the transect.
DDV27	SS.SCS.ICS Infralittoral coarse sediment	Dead and some live maerl (50.158604°N, 5.049511°W); Scallop; Brachyura; Sabellidae; Anemone; *L. conchilega*	Coarse sediment at start of transect, composed of dead maerl, shell, gravel, limited live maerl. Sediment waves throughout with troughs and peaks of maerl debris. Scallops seen throughout. Live maerl in second half of transect.

Transect No.	JNCC Biotopes Identified	Notable Species Identified	Brief Summary
DDV28	SS.SCS.ICS Infralittoral coarse sediment	Dead maerl (50.157286°N, 5.046378°W); starfish, sabellidae; live maerl (50.157286°N, 5.046378°W); Scallops; sea squirts; Laminariaceae; *S. latissima*; *M. glacialis*; Anemone; *Maja brachydactyla*.	Coarse sediment from the start with live maerl, dead maerl and shell forming a mosaic (some soft sediment seen initially but not characteristic of the transect in general which was coarse sediment dominated). The live maerl is sporadic but continual [i.e., not a carpet] and associated with the aggregations of shell in the troughs of the sediment waves as seen in Transect 27. A number of *M. glacialis* seen, presumably feeding on the abundant bivalves present (but not seen). *S. latissima* present throughout draping the waves sporadically. Small fish seen occasionally.
DDV29	SS.SCS.ICS Infralittoral coarse sediment	Dead maerl (50.159277°N, 5.045710°W); Orange sponge; *Raja montagui*; Brachyura; *M. brachydactyla*; *M. glacalis*; Scallop; Live maerl (50.158342°N, 5.045001°W); Porifera	At the start of the transect the sediment waves are short and shell debris is gathered in the troughs with the peaks largely composed of dead maerl fragment. No live maerl seen. Later small pieces of live maerl occur more so in the second half of the transect where a few more developed, larger pieces are seen most notably in the troughs of the sediment waves (particularly in the final third of the transect).
DDV30	SS.SMp.Mrl Maerl beds	*M. glacialis*; Live & dead maerl (50.156671°N, 5.041363°W); Saccharina latissima; Anemone; *Gibbula* spp; *L. conhilega*	Coarse sediment with live maerl not constrained to troughs but distributed across the visible area as sediment waves not present. Occasional dead maerl patches evident mosaicking with areas where live maerl dominates. Overall, strong presence of live maerl throughout the transect. *M. glacialis*, as at other maerl sites, encountered with some regularity sometimes next to small excavation pits most likely where a bivalve was dug out and consumed. Maerl beds typically have 30% or more cover (Hall-Spencer et al., 2010).

Transects nearest to the Port berths and jetties consisted of predominantly SS.SMu – Sublittoral cohesive mud and sandy mud communities (JNCC, 2022d) and SS.SMx.IMx – Infralittoral mixed sediment (JNCC, 2022b) (Figure 4.1), with generally mixed (more coarse) sediments occurring further from the port structures. Transects in the approach channel were generally characterised as SS.SCs.ICs – Infralittoral coarse sediment (JNCC, 2022a). A single transect (DDV30), located in the main approach channel, was characterised as SS.SMp.Mrl – Maerl Beds (JNCC, 2022c) along its entire length. The presence of this key habitat type throughout the survey area is discussed more fully in the next section.

4.2 Maerl Distribution

Whilst only one of the transects within the survey area was characterised as being a maerl bed (DDV30), dead maerl was recorded on 11 of the 24 transects and live maerl on 6 of the 24 transects. The positions of live and dead maerl recordings within the survey area are presented in Figure 4.2 and reference images are presented in Table 4.2.

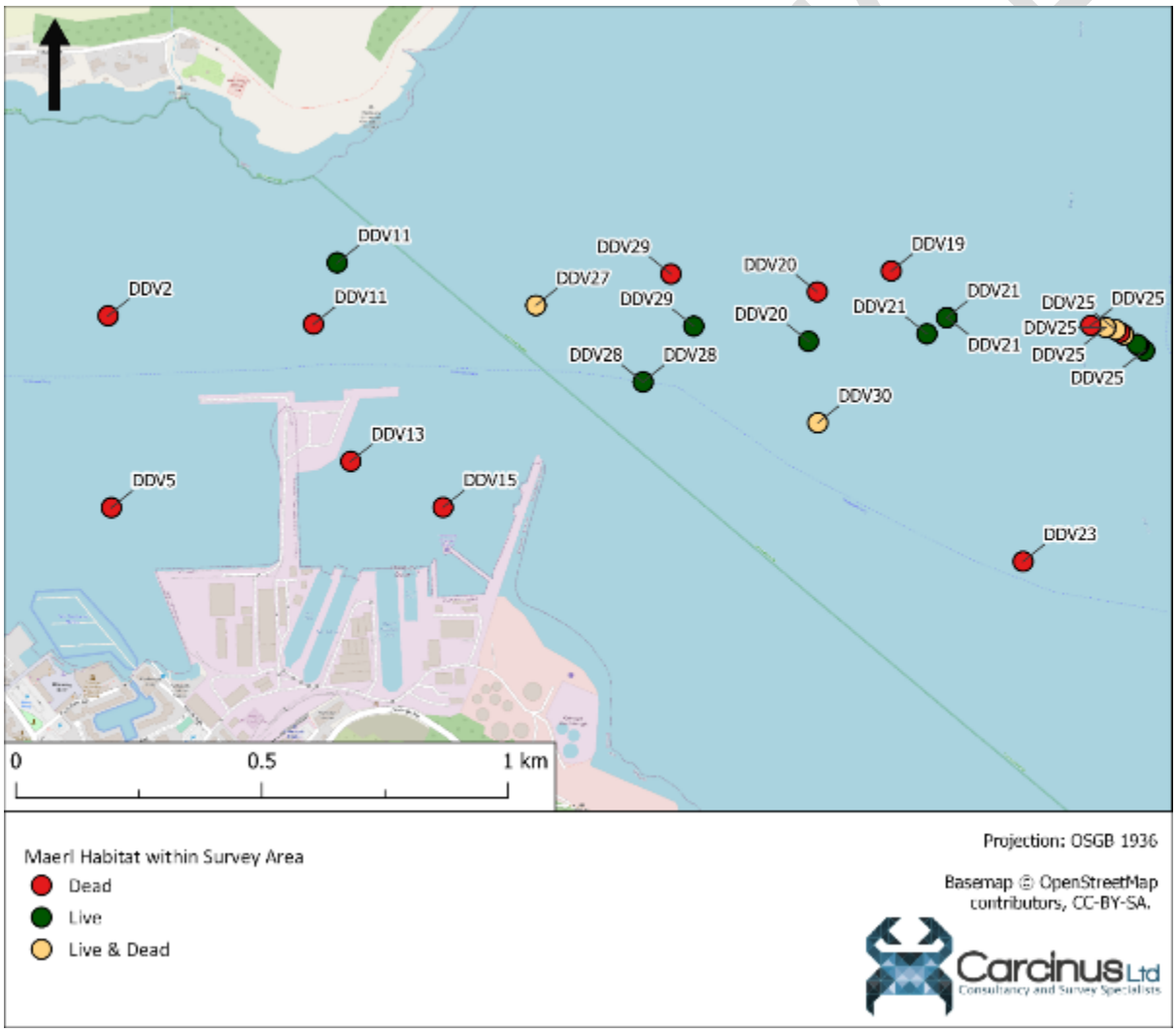
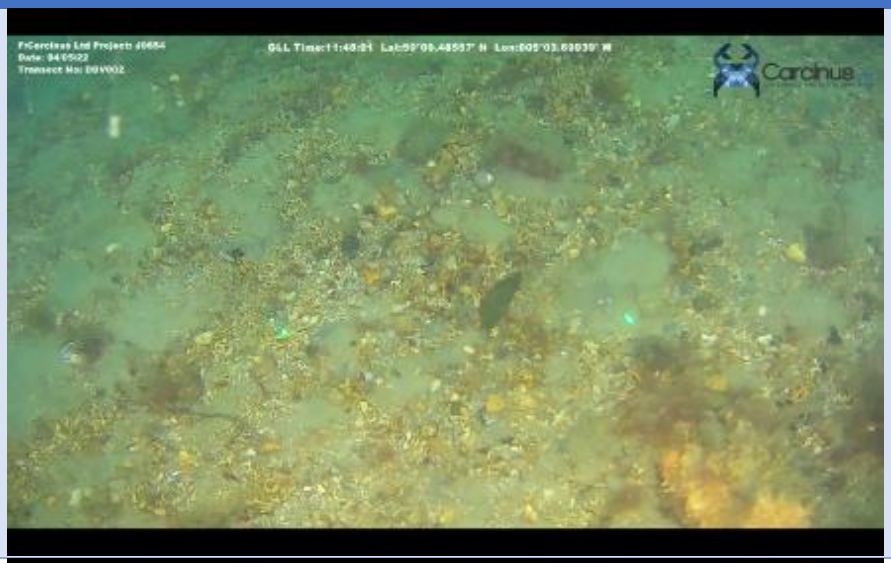
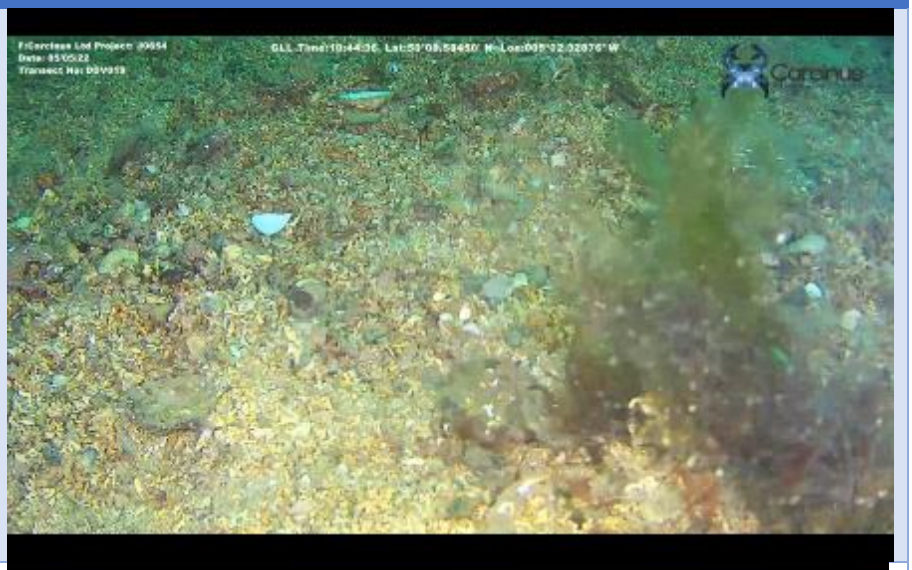


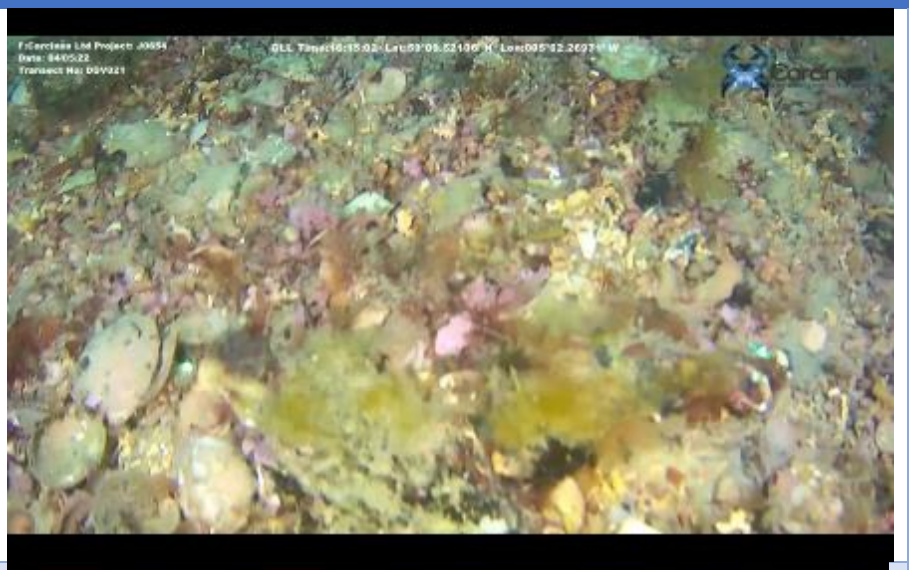
Figure 4.2 Locations of Maerl (both alive and dead) along DDV transects.

Table 4.2 Maerl along DDV transects.

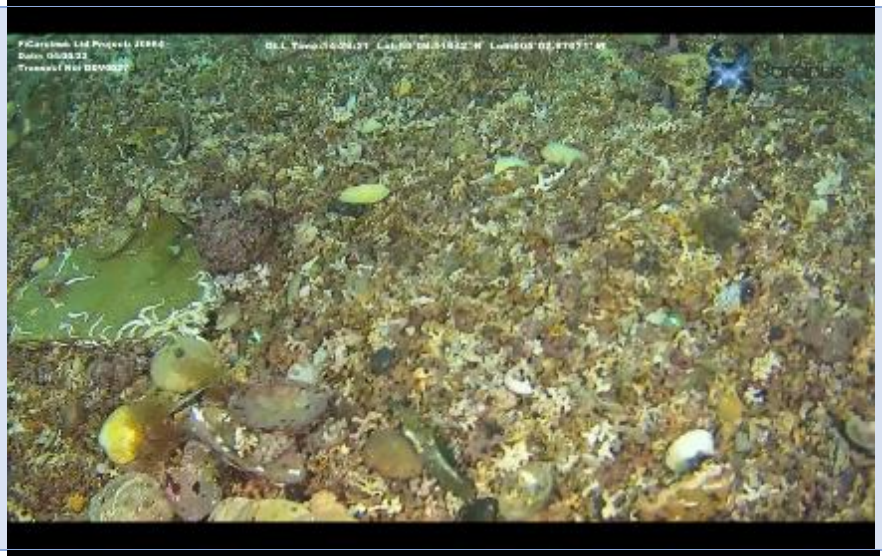
Transect No.	Maerl Dead / Alive	Reference Image
DDV2	Dead	
DDV5	Dead	
DDV11	Dead	

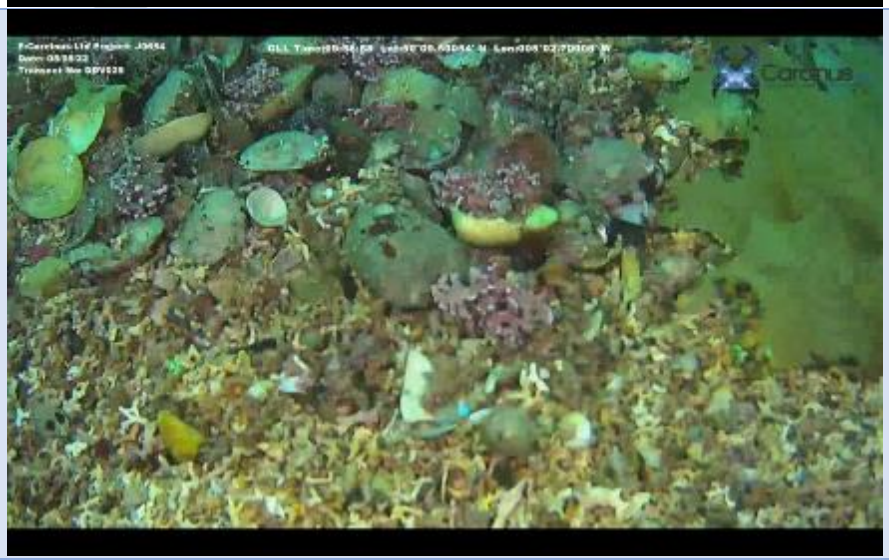
Transect No.	Maerl Dead / Alive	Reference Image
DDV11	Live	
DDV13	Dead	
DDV15	Dead	

Transect No.	Maerl Dead / Alive	Reference Image
DDV19	Dead	
DDV20	Dead	
DDV20	Live	

Transect No.	Maerl Dead / Alive	Reference Image
DDV21	Dead	
DDV21	Live and dead	
DDV21	Live	

Transect No.	Maerl Dead / Alive	Reference Image
DDV23	Dead	
DDV25	Live	
DDV25	Dead	

Transect No.	Maerl Dead / Alive	Reference Image
DDV25	Live & Dead	
DDV27	Live & Dead	
DDV28	Dead	

Transect No.	Maerl Dead / Alive	Reference Image
DDV28	Live and dead	
DDV29	Dead	
DDV29	Live	

Transect No.	Maerl Dead / Alive	Reference Image
DDV30	Live	
DDV30	Live & Dead	

4.3 Notable Flora and Fauna

Sabellid worms such as *Myxicola infundibulum* and *Sabella* spp. were very common across the survey area, being recorded along virtually all transects. Decapods of the infraorder Brachyura ('true crabs') were also very common. Various teleost fish, A variety of green (such as *Ulva* spp.), red and brown algal species were recorded throughout the transects. The leathery sea squirt *Styela clava* was noted in DDV9, near the port jetty. It was first recorded in the UK in Plymouth in 1953, but has since been recorded in various ports throughout Europe (Neish, 2007).

5 References

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Neish, A. H. (2007). *Styela clava: Leathery sea squirt*. Marine Life Information Network: Biology and Sensitivity Key Information Reviews. https://www.marlin.ac.uk/species/detail/1883

APPENDIX 4C: MARINE ARCHAEOLGY METHODOLOGY AND SIGNIFICANCE CRITERIA

APPENDIX 4C: Marine Archaeology Methodology and Significance Criteria

The assessment will also be undertaken in a manner consistent with available guidance, listed below in chronological order:

- Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers[1]
- Managing Lithic Scatters: Archaeological Guidance for planning authorities and developers[2]
- Military Aircraft Crash Sites: Archaeological guidance on their significance and future management[3]
- The Code of Practice for Seabed Developers[4]
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment[5]
- Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition)[6]
- Ships and Boats: Prehistory to Present - Designation Selection Guide[7]
- National Policy Statement for Ports[8]
- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes[9]
- Ports and the Historic Environment. NHPP 4A3 (Historic ports, dockyards, harbours and coastal resorts)[10]
- Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest[11]
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record[12]
- Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2[13]
- The Assessment and Management of Marine Archaeology in Port and Harbour Development[14]
- Preserving Archaeological Remains Decision-taking for Sites under Development[15]

[1] English Heritage (now Historic England), 1998. *Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers*
[2] English Heritage (now Historic England), 2000. *Managing Lithic Scatters: Archaeological Guidance for planning authorities and developers*
[3] English Heritage (now Historic England), 2002. *Military Aircraft Crash Sites: Archaeological guidance on their significance and future management*. Available at https://historicengland.org.uk/images-books/publications/military-aircraft-crash-sites/milairсsites/ [accessed September 2022]
[4] Joint Nautical Archaeology Policy Committee, 2006. *The Code of Practice for Seabed Developers*. Available at http://www.jnapc.org.uk/Code%20of%20Practice%20No.2.pdf [accessed August 2022]
[5] English Heritage (now Historic England), 2008. C*onservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment*. Updated consultation draft 10/11/2017
[6] English Heritage (now Historic England), 2011. *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (second edition)
[7] English Heritage (now Historic England), 2012. *Ships and Boats: Prehistory to Present - Designation Selection Guide*.
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[9] Plets, R., Dix, J. and Bates, R., 2013. *Marine geophysics data acquisition, processing and interpretation: Guidance notes*. London: English Heritage
[10] Fisher Associates, 2014. *Ports and the Historic Environment. NHPP 4A3 (Historic ports, dockyards, harbours and coastal resorts).* Available at https://historicengland.org.uk/research/results/reports/7002/PortsandtheHistoricEnvironment [accessed September 2022]
[11] PIANC, 2014. *Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest*. Guidance document No 124-2014
[12] English Heritage (now Historic England), 2015. *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record*. Available at https://historicengland.org.uk/images-books/publications/geoarchaeology-earth-sciences-to-understand-archaeological-record/heag067-geoarchaeology/ [accessed September 2022]
[13] Historic England, 2015. *Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2*. Available at https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/ [accessed September 2022]
[14] Historic England, 2016. *The Assessment and Management of Marine Archaeology in Port and Harbour Development*. Available at https://historicengland.org.uk/images-books/publications/assessment-management-marine-archaeology-port-and-harbour-development/6801-ports-and-harbours/ [accessed September 2022]
[15] Historic England, 2016. *Preserving Archaeological Remains Decision-taking for Sites under Development*. Available at https://historicengland.org.uk/images-books/publications/preserving-archaeological-remains/heag100a-preserving-archaeological-remains/ [accessed September 2022]

- Cornish Ports and Harbours: assessing heritage significance, threats, protection and opportunities[16]
- The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning: 3 (Second Edition)[17]
- Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits[18]
- Standard and Guidance for Archaeological Advice by Historic Environment Services[19]
- Standard and guidance for historic environment desk-based assessment[19]
- Code of Conduct: Professional Ethics in Archaeology[20]

The results of the technical report will be used to prepare a robust chapter for the Environmental Statement, clearly presenting the information regarding the known and potential marine heritage receptors, with a discussion as to their archaeological value and sensitivity to impact.

Assessment Criteria and Assignment of Significance

The UK Marine Policy Statement[21] describes a heritage asset (including archaeological receptors) as holding a degree of significance, where significance relates to the heritage interest of an asset that may be archaeological, architectural, artistic, or historic.

For the significance of any given impact to be fully understood, the sensitivity of any receptors that may be impacted need to be considered along with the magnitude of the effect. The criteria used to assess the significance of an impact is presented below.

Receptor Sensitivity

The sensitivity of a historic environment receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. The sensitivity of the receptor will be assessed with regard to the following factors:

- Value – a measure of the receptor's importance, rarity and worth.
- Adaptability – the degree to which a receptor can avoid or adapt to an effect.
- Tolerance – the ability of a receptor to accommodate temporary or permanent change without significant negative impact.
- Recoverability – the temporal scale over and extent to which a receptor will recover following an effect.

The National Planning Policy Framework[22] states that heritage assets should be recognised as 'an irreplaceable resource' and to 'conserve them in a manner appropriate to their significance'.

Archaeological receptors cannot typically adapt, tolerate, or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor is predominantly quantified only by their value. Where receptors are considered to be

[16] Cornwall Council, 2017. *Cornish Ports and Harbours: assessing heritage significance, threats, protection and opportunities*. York: Archaeology Data Service [distributor] https://doi.org/10.5284/1042743 [accessed September 2022]
[17] Historic England, 2017. *The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning: 3* (Second Edition)
[18] Historic England, 2020. *Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits*. Available at https://historicengland.org.uk/images-books/publications/deposit-modelling-and-archaeology/heag272-deposit-modelling-and-archaeology/ [accessed September 2022]
[19] Chartered Institute for Archaeologists, 2020. *Standard and Guidance for Archaeological Advice by Historic Environment Services*. Published December 2014, updated June 2020. Available at https://www.archaeologists.net/sites/default/files/CIfAS%26GArchadvice_4.pdf [accessed September 2022]
[20] Chartered Institute for Archaeologists, 2021. *Code of Conduct: Professional Ethics in Archaeology*. Published December 2014, revised October 2021. Available at https://www.archaeologists.net/sites/default/files/Code%20of%20conduct.pdf [accessed September 2022]
[21] Department for Environment, Food and Rural Affairs, 2011. *UK Marine Policy Statement*. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf [accessed August 2022]
[22] Ministry of Housing, Communities and Local Government, 2021. *National Planning Policy Framework*. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [accessed September 2022], pp. 55

capable of adapting to, tolerating, or recovering from indirect impacts, these factors will be incorporated into an assessment of their sensitivity.

Value of Marine Archaeological Receptors

Based on Historic England's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment[5], the significance of a historic asset 'embraces all the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it'.

Within the ES chapter, significance will be weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- Evidential value – deriving from the potential of a place to yield evidence about past human activity.
- Historical value – deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative.
- Aesthetic value – deriving from the ways in which people draw sensory and intellectual stimulation from a place.
- Communal value – deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.

It should be noted that, while designation indicates that a receptor has been identified as being of high value, non-designated archaeological assets are not necessarily of lesser value. Consequently, non-designated receptors that can be demonstrated to be of equivalent value to designated sites are considered to be of equivalent significance.

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

The value of known archaeological assets will be assessed on a five-point scale using professional judgement informed by criteria provided in Table 1.

Table 1: Criteria to assess the archaeological value of assets

Value	Definition
High	Above average example and/or high potential to contribute to knowledge and understanding and/or outreach. Assets with a demonstrable national dimension to their importance are likely to fall within this category. Receptors with a demonstrable international dimension to their importance are likely to fall within this category. All other wrecked ships and aircraft with statutory protection under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value. Palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.
Medium	Average example and/or moderate potential to contribute to knowledge and understanding and/or outreach.

Value	Definition
	Receptors with a demonstrable district level dimension to their importance are likely to fall within this category. Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Low	Below average example and/or low potential to contribute to knowledge and understanding and/ or outreach. Receptors with a demonstrable local dimension to their importance are likely to fall within this category. Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have low potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Negligible	Poor example and/or little or no potential to contribute to knowledge and understanding and/or outreach. Assets with little or no surviving archaeological interest.
Unknown	There is not presently enough information available about the site to assess its value.

The perceived value of each marine archaeological receptor will be generally assessed and assigned on a site-by-site basis, using professional judgement and past experience, and with reference to the criteria listed in Table 2.

The nature of the marine archaeological resource is such that there is often a high level of uncertainty regarding the presence/absence, distribution, extent, and nature of archaeological assets on the seafloor. As a precautionary measure, unknown potential cultural heritage assets will therefore be considered to be of high sensitivity and high value, until more information is available.

Furthermore, On the Importance of Shipwrecks[23] suggests importance can be assessed through the following criteria: build, use, loss, survival, and investigation.

In general, the Selection Guide on Boats and Ships in Archaeological Contexts[24] drew some generalisations about importance based on the age of the wreck:

- Pre-1500 AD: this covers the period from the earliest Prehistoric evidence for human maritime activity to the end of the medieval period, circa 1508. Little is known of watercraft or vessels from this period and archaeological evidence of them is so rare that all examples of craft are likely to be of special value.
- 1501-1815: this encompasses the Tudor and Stuart periods, the English Civil War, the Anglo-Dutch Wars and later the American Independence and French Revolutionary Wars. Wreck and vessel remains from this date are also quite rare, and can be expected to be of special value.
- 1816-1913: this period witnessed great changes in the way in which vessels were built and used, corresponding with the introduction of metal to shipbuilding, and steam to propulsion technology. Examples of watercraft from this period are more numerous and as such, it is

[23] Wessex Archaeology, 2006. *On the importance of shipwrecks, final report*. York: Archaeology Data Service [distributor]. Available at https://doi.org/10.5284/1000313 [accessed September 2022]
[24] Wessex Archaeology, 2008. *Selection Guide: Boats and Ships in Archaeological Contexts*. Salisbury: unpublished report

those that specifically contribute to an understanding of these changes that should be regarded as having special value.

- 1914-1945: this period encompasses the First World War, the Interwar years and the Second World War. This date range contains Britain's highest volume of recorded boat and ships losses. Those which might be regarded as having special interest are likely to relate to technological changes and to local and global activities during this period.
- Post 1945: the final period extends from 1946 through the post-war years to the present day. Vessels from this date range would have to present a strong case if they are to be considered of special interest.

According to this composite timeline, vessels that pre-date 1816 are likely to be considered of special value on the basis of their rarity and subsequent national and international value in our understanding of maritime activity and shipping movements during these periods.

Magnitude of Effect

The magnitude of effect upon known and potential marine archaeological receptors can be outlined by the following factors:

- Extent – the area over which an effect occurs.
- Duration – the time for which the effect occurs.
- Frequency – how often the effect occurs.
- Severity – the degree of change relative to existing environmental conditions.

The magnitude of effect is defined by the criteria presented in Table 2.

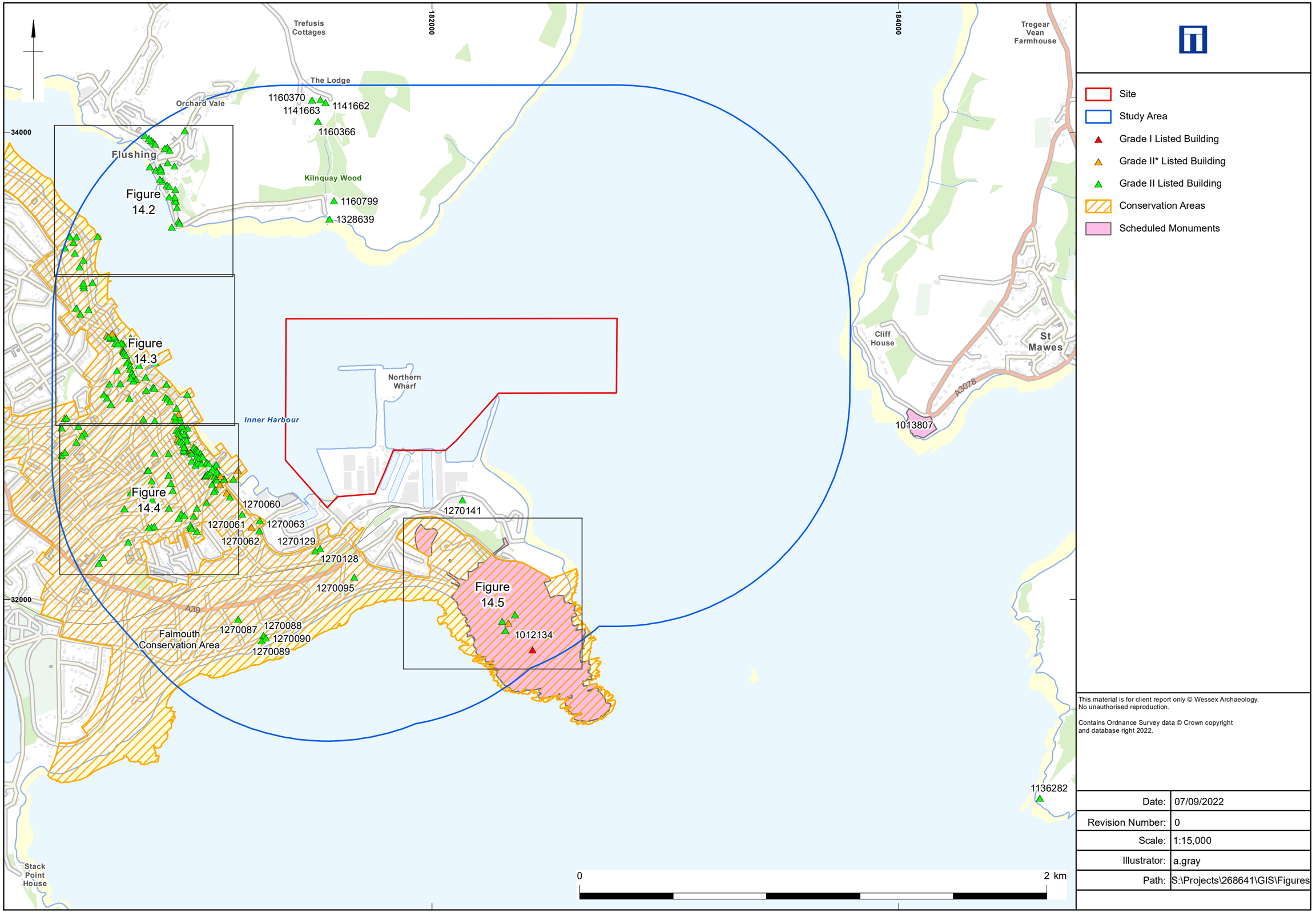
Table 2: Magnitude of Effect Definitions

Magnitude	Definition
High	Total loss of or major alteration to key elements or features of the pre-project conditions, such that the post-project character or composition of the feature would be fundamentally changed.
Medium	Loss of or alteration to key elements or features of the pre-project conditions, such that the post-project character of the feature would be partially changed.
Low	Minor alteration from pre-project conditions.
Negligible	No or unquantifiable change to pre-project conditions.

Significance of Impact

The significance of an impact (positive or negative) on an archaeological receptor, whether a direct or indirect impact, is determined as a combination of the sensitivity of the archaeological receptor (Table 1) and the measures of the magnitude of the effect (Table 2). The matrix presented in Table 2 of Appendix 1 provides a guide to the assessment but is not a substitute for professional judgement and interpretation, particularly where the sensitivity or effect magnitude levels are not clear or are borderline between categories.

APPENDIX 4D: HERITAGE ASSETS FIGURE, WESSEX ARCHAEOLOGY 2022



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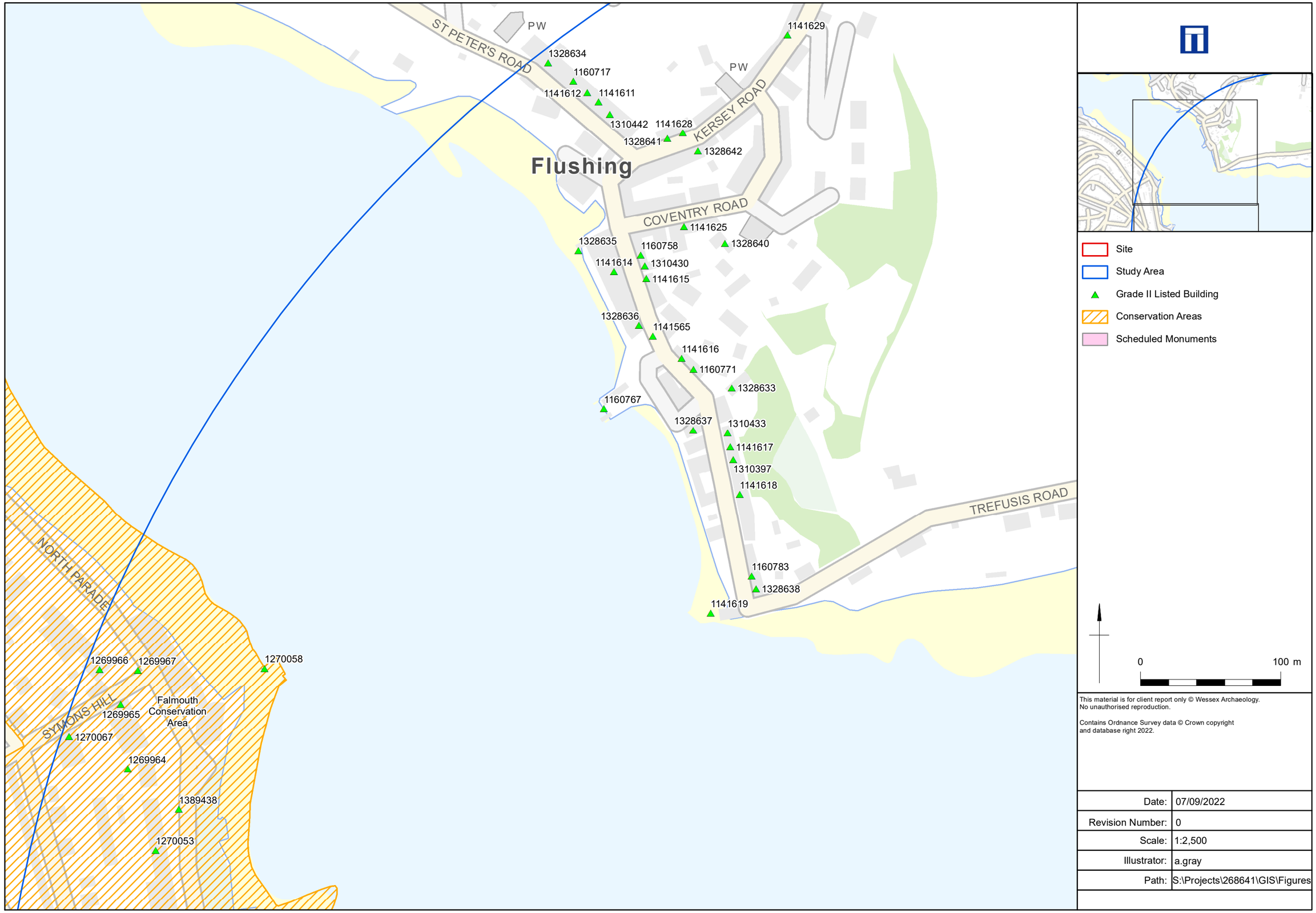
Designated Heritage Assets within the 1km Study Area

Figure 14.1



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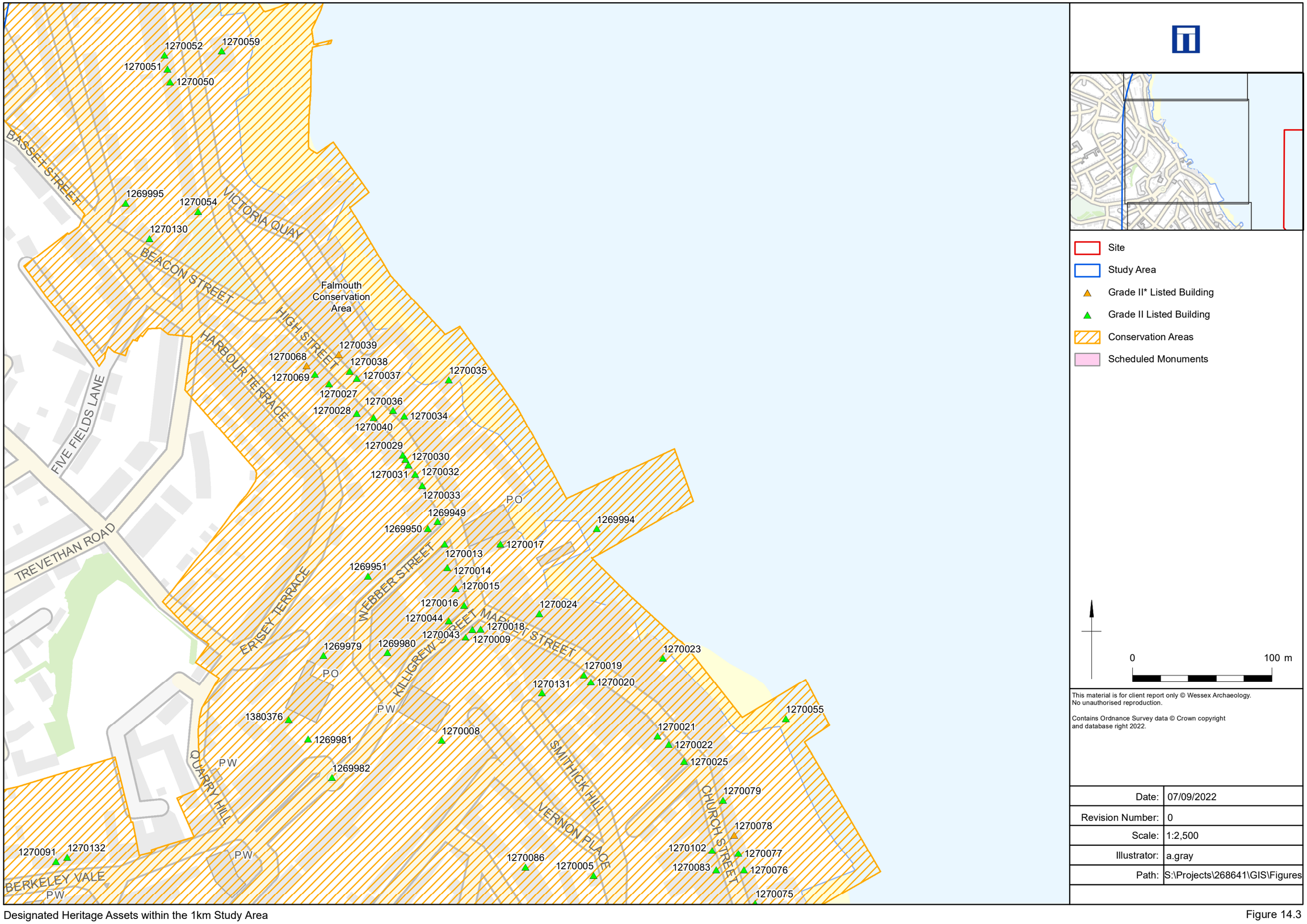
Designated Heritage Assets within the 1km Study Area

Figure 14.2



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Designated Heritage Assets within the 1km Study Area

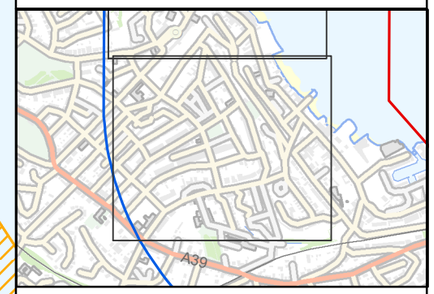
Figure 14.3

FALMOUTH

1270093 1270092 1270045 1270046 1270047 1270007 1270006 1270075 1270074 1270103 1270104 1269947 1270105 1270073 1270106 1270070 1270107 1270072 1270108 1270071 1270109 1270110 1270111 1270144 1270145 1270082 1270146 1270085 1270081 1270148 1270084 1270066 1270080 1270147 1270149 1270150 1270151 1270153 1270152 1269990 1270112 1270114 1270113 1270115 1270000 1269991 1269999 1270123 1269983 1270116 1270124 1269998 1270118 1269996 1269997 1270117 1270122 1269943 1270119 1270120 1269984 1270049 1269975 1270121 1270041 1270042 1270126 1270127 1270143 1269993 1269952 1269953 1269958 1269961 1269960 1269959 1270064 1270065 1269957 1269985 1270026 1269956 1270142 1269955 1269948 1269954 1269946 1270056 1270057 1269986 1269962 1269926 1269963 1269924 1269922 1269923

PW

BROOK PLACE
BROOK STREET
KILLIGREW STREET
PELAWNY ROAD
WELLINGTON TERRACE
CLARE TERRACE
CHURCH STREET
WATERLOO ROAD
NORFOLK ROAD
WODEHOUSE TERRACE
GYLLYNG STREET
NEW STREET
WINDSOR TERRACE
LISTER HILL
LISTER STREET
TRELAWNEY ROAD
BUDOCK PLACE
BUDOCK TERRACE
MERRILL PLACE
MARLBOROUGH ROAD
Falmouth Conservation Area
FLORENCE TERRACE
FLORENCE PLACE
MINNIE PLACE
PIKE'S HILL
SWANPOOL STREET
HULL'S LANE
ARWENACK AVENUE
ALBANY ROAD
CAMBRIDGE PLACE
A39 WESTERN TERRACE
WOODLANE CRESCENT
WOODLANE
TRELAWNEY AVENUE
WOODLANE DRIVE
WOODLAND CLOSE
FOXS LANE
MELVILL CRESCENT
GROVEHILL CRESCENT
GROVEHILL DRIVE



Site
Study Area
Grade II* Listed Building
Grade II Listed Building
Conservation Areas
Scheduled Monuments

0 100 m

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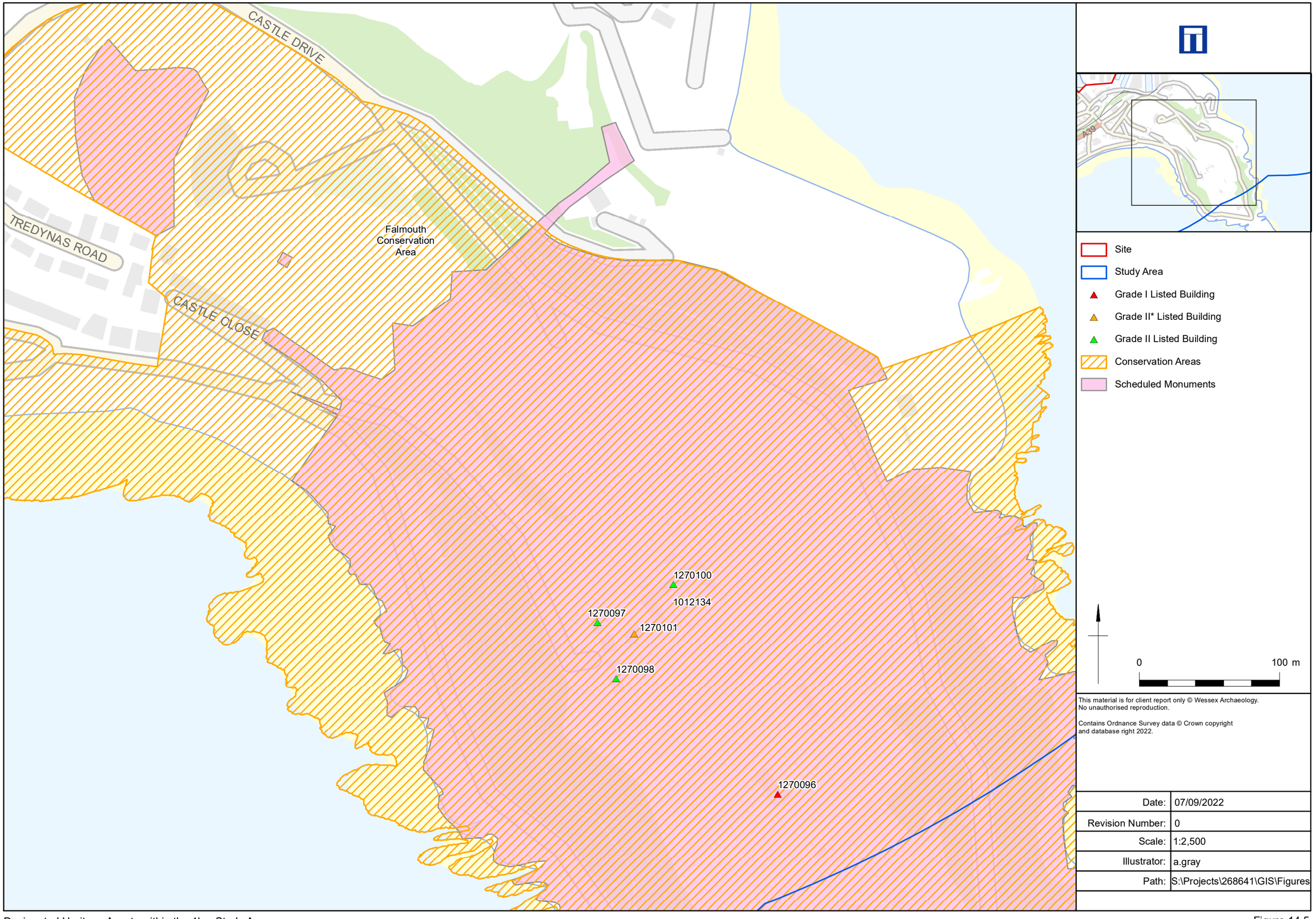
Designated Heritage Assets within the 1km Study Area

Figure 14.4



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Designated Heritage Assets within the 1km Study Area

Figure 14.5

APPENDIX 4E: HERITAGE ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

APPENDIX 4E: Heritage Methodology and Significance Criteria

Generally, the value/importance of an asset can be divided into the categories presented in Table 1.

Table 1: Indicative Value/ Importance of Heritage Assets

Value/ Importance	Type of Heritage Asset
Very High	• World Heritage Sites • Non-designated heritage assets which are considered to be of international importance (likely directly associated with World Heritage Site)
High	• Scheduled monument • Grade I, II* and II listed buildings • Conservation areas (of national importance) • Grade I, II* and II registered parks and gardens • Registered battlefields • Non-designated heritage assets which are considered to be nationally important (likely directly associated with designated heritage assets)
Medium	• Conservation areas (of regional importance) • Non-designated heritage assets which are considered to be of regional importance
Low	• Non-designated heritage assets of local importance
Negligible	• Non-designated heritage assets of poor understanding, preservation, condition and survival (this could also include common archaeological features and/or buildings with little to no discernable value)
Unknown	• Heritage assets where the value is currently not determined

The magnitude of impact reflects the degree to which the significance of a heritage asset is altered due to a proposed development (see Table 2). The assignment of a magnitude of impact is a matter of professional judgement and takes into account the nature of the change, whether elements contributing to significance are affected, and the proportion of the feature affected.

Table 2: Magnitude of Impact

Magnitude of Impact	Description
High	*Adverse* • Total loss of or major physical damage to or significant alteration to a site, building or other feature. • Extensive change (*e.g.*, loss of dominance, intrusion on key view or sightline) to the setting of a designated heritage asset or other feature recognised to be of national importance, which may lead to a major reduction in the contribution of that setting to the heritage significance of the asset so that the asset loses heritage significance, and a major reduction in the ability to experience and/or appreciate that heritage significance. *Beneficial* • Large scale or major improvement to a site, building or other feature. • Extensive change (e.g., re-establishment of dominance, key view of sightline) to the setting of a designated heritage asset or other feature to be recognised to be of national importance, which may lead to a major improvement in the contribution of that setting to the heritage significance of the asset, and major improvement to the ability to experience and/or appreciate that heritage significance.
Medium	*Adverse* • Damage or alteration to a site, building or other feature. • Change in setting (*e.g.*, intrusion on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate reduction in the contribution of that setting to the heritage significance of the asset. Change/reduction in the ability to experience/appreciate that heritage significance. *Beneficial*

Magnitude of Impact	Description
	• Improvement to a site, building or other feature. • Change in setting (*e.g.*, improvement on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate increase in the contribution of that setting to the heritage significance of the asset. Increase in the ability to experience/appreciate that heritage significance.
Low	*Adverse* • Minor damage or alteration to a site, building or other feature. • Minor change in setting (*e.g.*, above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the heritage significance of the heritage asset, and limited loss of heritage significance. Limited change in or reduction of the ability to experience or appreciate the heritage significance of an asset. *Beneficial* • Minor improvement to a site, building or other feature. • Minor beneficial change in setting (*e.g.*, above historic skylines or in designed vistas) of monuments, building, sites and other features, which may lead to a small improvement in the contribution the setting makes to the heritage significance of the heritage asset. Limited improvement in the ability to experience or appreciate the heritage significance of an asset.
Negligible	• No physical effect, either adverse or beneficial. • Slight or no change in setting (either adverse or beneficial), with no or very limited change in the contribution that setting makes to the heritage significance of the asset. No or minimal change in the ability to experience or appreciate the heritage significance of the asset.

The magnitude of change can either be beneficial or adverse and can come through either direct or indirect impacts. Direct impacts are often caused by physical changes during the construction process, while indirect impacts can often cause to changes in the setting of a heritage asset which could in turn harm the significance of a heritage asset.

Effects can be temporary or permanent, short term or long term and in some cases, but not all, are reversible. For example, archaeological remains once removed cannot be reinstated.

The significance of effects is calculated by way of measuring the magnitude of impact against the value/importance of the heritage asset. This matrix is presented in Table 3.

Table 3: Significance of Effects

Magnitude of Impact	Sensitivity (value/ importance) of heritage asset				
	Very High	**High**	**Medium**	**Low**	**Negligible**
High	**Major (Significant)**	**Major (Significant)**	**Moderate (Significant)**	Minor (Not Significant)	Not Significant
Medium	**Moderate (Significant)**	**Moderate (Significant)**	**Moderate (Significant)**	Minor (Not Significant)	Negligible (Not Significant)
Low	Minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

APPENDIX 4F: NAVIGATION RISK ASSESSMENT METHODOLOGY

APPENDIX 4F: Navigation Risk Assessment Approach and Methodology

The Navigation Risk Assessment (NRA) will be undertaken following the UK national standard for the safe and efficient running of ports, as published in the latest version of the Department for Transport's 'Port Marine Safety Code', and its accompanying guidance document 'A Guide to Good Practice on Port Marine Operations'.

Certain sections of the following documents, which provide supplementary guidance, may be used to provide definitions and processes where concepts within them are relevant to the proposed scheme operated within the boundary of a Statutory Harbour Authority:

- International Maritime Organization (IMO) Revised Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule making process (IMO, 2018); and
- Marine Guidance Note (MGN 654) Offshore Renewable Energy Installations (OREI) safety response. Incorporating: Annex 1 Methodology for assessing marine navigational safety and emergency response risks of OREIs. Maritime and Coastguard Agency (MCA, 2021).

Risk assessment is based on a comprehensive and formal assessment of hazards with a view to either eliminating unsafe activities or reducing risks to 'as low as reasonably practicable' (ALARP). ALARP is an industry-wide concept, applying to both health and safety and port marine safety. Regardless of whether a scenario produces a minor or significant hazard, mitigation in the form of risk controls need to be taken into account to ensure that the risks overall are ALARP. Central to this standard is the term 'reasonably practicable'. To meet this standard, the NRA aims to balance risk against the effort, time and money required to control the risk.

Further, the concept of 'tolerability' seeks to define the point at which a risk has an unacceptable outcome (a function of frequency and consequence) when measured against key criteria. Those criteria in respect of marine risk are defined in the Code's Guide to Good Practice as:

- human life;
- the environment;
- port/port user operations; and
- port/shipping infrastructure damage (DfT, 2018).

Determining whether the predicted level of risk is acceptable requires a two-part test:

- Firstly, is the risk tolerable; and
- Secondly, is the risk mitigated to ALARP.

When used as part of the assessment process the NRA will allow an appropriate authority, such as a Statutory Harbour Authority, to determine whether a hazard outcome (risk) is both tolerable and ALARP.

NRA Approach

The approach proposed for the NRA will evaluate risk by utilising a matrix approach using the four receptors of human life, the environment, port/port user operations and port/shipping infrastructure damage. It is based on concepts of 'Most Likely' and 'Worst Credible', which reflects the range of outcomes arising from a vessel accident and assesses the frequency of occurrence combined with the assessment of typical consequences. This complies with the requirements stated in the Port Marine Safety Code. To enable the NRA to be utilised within the Marine Safety Management System (MSMS), following submission, local port descriptors for frequency and consequence will be adopted.

The NRA will determine the risk to marine and navigation activities associated with the proposed development. To do so, the potential hazards of the proposed development will be considered in the following phases:

- Construction: construction craft and activities, including any dredging during installation of infrastructure; and
- Operation: change to the study area's vessel movements including any maintenance dredging as a result of the development.

The approach will use the following five stages identified in the PMSC and IMO's FSA:

1. Identification of hazards: listing of potential marine hazard scenarios, describing hazard descriptions and outcomes, carried out as a workshop with stakeholders.
2. Risk analysis: determination of frequency and consequence for each hazard scenario).
3. Risk assessment and control options: consideration of existing (embedded) mitigation measures, which either reduce the outcome frequency or control the severity or both; and potential risk controls, which are not currently in place, but could be used to further reduce or eliminate risk.
4. Cost-benefit assessment: an evaluation of the time, cost, and physical difficulty of taking the measures identified to avoid or reduce the risk.
5. Recommendations for decision-making: final decisions in determining risk made by the Statutory Harbour Authority's Duty Holder.

The NRA process will need to be informed by Data Gathering and Vessel Traffic Analysis.

Data Gathering and Vessel Traffic Analysis

Data Gathering

The NRA will require traffic information, obtained from Automatic Identification System (AIS) vessel data, visual observations or non-AIS traffic and mapped information. This will be sourced from onsite receivers, cameras and printed information. Stakeholder consultation will be used to validate any anecdotal information on routeing and study area use by vessel traffic. The primary source of data to undertake a quantitative assessment of vessel traffic will be AIS data.

The analysis of up-to-date AIS data will be undertaken to establish:

- Numbers, types and sizes of vessels presently transiting the study area;
- Non-transit uses of the areas, e.g. fishing, recreational activities, dredging; and
- Traffic densities within the study area.

Marine accident and incident records will be sourced from the Marine Accident Investigation Branch (MAIB) and the Royal National Lifeboat Institute (RNLI). Digital data collected during the desk study will be Geographic Information System (GIS) software compatible. Data will be sourced in various formats, including both static files and cloud-based services. All data collated for the project will be stored and managed in line with required GIS standards and guidelines (subject to data licensing terms and conditions).

Vessel Traffic Analysis

To inform the NRA, marine traffic information will be collected and considered, following guidance in MGN 654 (MCA, 2021). To ensure a representative sample is obtained, a minimum of 14-days of data will be recorded during a busy marine traffic period and 14-days during a quiet period.

Vessel Categories and Density

Falmouth is used by a wide variety of commercial and recreational vessels. To help structure the traffic analysis the following vessel type categories are intended for use:

- Non-Port Services Craft;
- Port Service Craft;
- Dredging or Underwater Operations;
- High Speed Craft;
- Military or Law Enforcement Vessel;
- Passenger (Cruise, Ferry and Local services)
- Cargo Vessel AIS;
- Tanker;
- Fishing Vessel;
- Recreational Vessel; and
- Unknown Craft.

Vessel density will be calculated from vessel transits (movements) using the total number of transit lines intersecting with each grid cell, calculated as a total, and then resolved back to an average weekly density. The grid will be coloured into bands to match the intensity of use in the study area.

Identification of Hazards

Incident Analysis

Information relating to incidents that have occurred in the past can provide a valuable input to the hazard identification and risk assessment process. Data from MAIB and RNLI incidents will be mapped to examine patterns. This is used at the HAZID workshop to inform stakeholder views and discussion.

Stakeholder Consultation

Consultation will be conducted with key local stakeholders to inform the NRA. A HAZID workshop will be held onsite to create a Hazard Log. Records of Stakeholders consulted as part of the NRA and the minutes of the stakeholder meetings would be attached as an appendix to the NRA.

Hazard Identification (HAZID)

When considering the introduction of new, or alterations to, port infrastructure, a collective process is required to identify new or altered hazards created by new trade or by the changes likely to arise in connection with marine operations. An incident may occur if new or altered port infrastructure and its associated trade has not been evaluated and all risks managed as far as reasonably practicable. As a basis for assessment, the categories of hazards identified in MGN 654, Annex H, are used, see Table 1 for categories.

Table 1 Hazard category definitions as defined in Annex H of MGN 654

Category	Description
Accidents to personnel	Accidents to personnel are defined as those accidents which cause harm to any person on board the vessel e.g. crew, passengers, stevedores, who do not arise as a result of one of the other accident categories. Essentially, it refers to accidents to individuals, though this does not preclude multiple human casualties as a result of the same hazard, and typically includes harm caused by the movement of the vessel when underway, slips, trips, falls, electrocution, confined space accidents, food poisoning incidents, etc.
Accidents to the general public	Accidents to the general public are defined as those accidents which lead to injury, death, or loss of property amongst the population ashore resulting from one of the other ship accident categories.
Allision	Defined as a violent contact between a vessel and a fixed structure.
Capsizing	The overturning of a vessel after attaining negative stability.
Collision	Collision is defined as a vessel striking, or being struck by, another vessel, regardless of whether either vessel is under way, anchored or moored; but excludes hitting underwater wrecks.
Contact	Contact is defined as a vessel striking, or being struck by, an external object that is not another vessel or the sea bottom. Sometimes referred to as impact.
Explosion	An explosion is defined as an uncontrolled release of energy which causes a pressure discontinuity or blast wave.
Fire	Fire is defined as the uncontrolled process of combustion characterised by heat or smoke or flame or any combination of these.
Flooding	Flooding is defined as sea water, or water ballast, entering a space, from which it should be excluded, in such a quantity that there is a possibility of loss of stability leading to capsizing or sinking of the vessel.
Foundering	To sink below the surface of the water.
Grounding	Grounding is defined as the ship coming to rest on, or riding across underwater features or objects, but where the vessel can be freed from the obstruction by lightening and/or assistance from another vessel (e.g. tug) or by floating off on the next tide.
Hazardous substance accidents	Hazardous substance accidents are defined as any substance which - if generated as a result of a fire, accidental release, human error, failure of process equipment, loss of containment, or overheating of electrical equipment - can cause impairment of the health and/or functioning of people or damage to the vessel. These materials may be toxic or flammable gases, vapours, liquids, dusts, or solid substances.
Loss of hull integrity	Loss of Hull Integrity is defined as the consequence of certain initiating events that result in damage to the external hull, or to internal structure and sub-division, such that any compartment or space within the hull is opened to the sea or to any other compartment or space.
Machinery related accidents	Machinery related accidents are defined as any failure of equipment, plant and associated systems which prevents, or could prevent if circumstances dictate, the ship from manoeuvring or being propelled or controlling its stability.
Payload related accidents	Payload related accidents include loss of stability due to cargo shifting and damage to the vessel's structure resulting from the method employed for loading or discharging the cargo. This category does not include incidents which can be categorised as Hazardous Substances, Fires, Explosions, Loss of Hull Integrity, Flooding accidents etc.

Category	Description
Stranding	Stranding is defined as being a greater hazard than grounding and is defined as the ship becoming fixed on an underwater feature or object such that the vessel cannot readily be moved by lightening, floating off, or with assistance from other vessels (e.g. tugs).

2. Risk Analysis

Subject matter experts and local port users in attendance at the HAZID workshop(s) contribute to the formation of the hazard scenario with descriptive and tailored 'worst credible' and 'most likely' events which are then assessed against four receptors of:

- human life;
- the environment;
- port/port user operations; and
- port/shipping infrastructure damage (DfT, 2018).

Figure 1 shows the discussion flow per hazard scenario used in the hazard identification and risk analysis process.

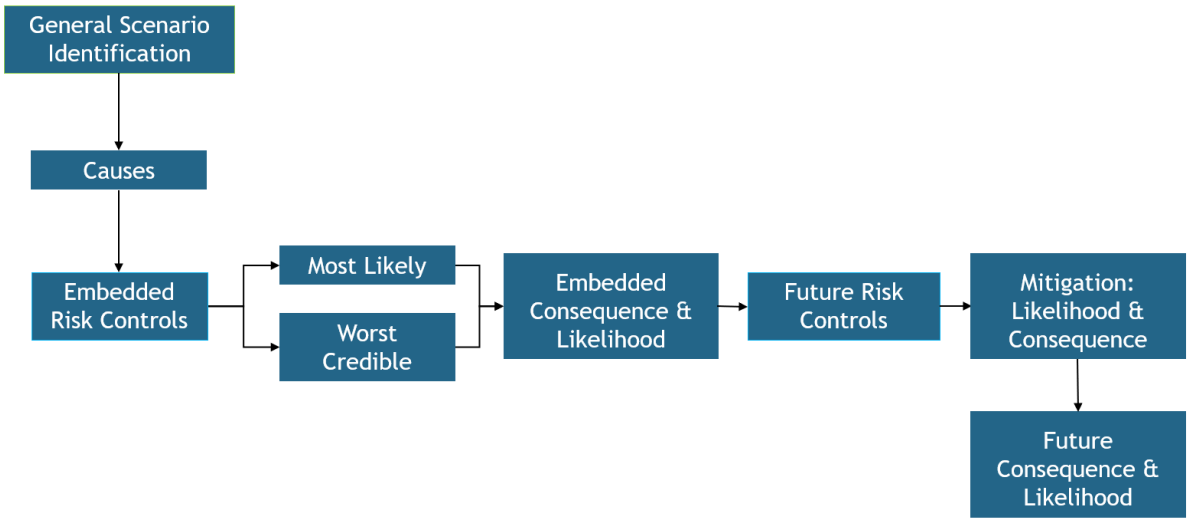


Figure 1: Hazard Identification and Risk Analysis Process

The frequency and consequence descriptors are used to inform the assignment of values to the hazard scenarios within the Hazard Log. The descriptors are arranged and agreed with the Statutory Harbour Authority to ensure the risk assessments are aligned with current harbour authority practices and proportional to the size of the port.

When using this risk matrix in combination with the frequency and consequence descriptors, the outcome for the receptors of life, environment, port users and port/shipping infrastructure is reached. This outcome is compared with risk tolerability. In most circumstances, intolerable risk is unacceptable unless sufficient control measures are able to be identified so as to reduce frequency and consequence to a position that is tolerable and ALARP.

3. Risk Assessment and Control Options

Following Hazard Identification and Risk Analysis the NRA process is then able to consider Risk Assessment and Further Applied Control options. Risk Assessment necessarily includes a review of existing (embedded) controls as well as potential controls identified. This step allows a broader view of controls, some of which may not have been considered at each of the HAZID workshops. It is likely that additional controls are identified, which if applied could further reduce the outcome of the risk if applied.

In doing so there is a hierarchy of risk control principles as advised in the Code's Guide to Good Practice. These are:

- Eliminate risks: by avoiding a hazardous procedure or substituting a less dangerous one;
- Combat risks: by taking protective measures to prevent risk;
- Minimise risk: by suitable systems of working. If a range of procedures is available, the relative costs need to be weighed against the degree of control provided, both in the short and long term (DfT, 2018).

As a result of this additional consideration and feedback, new causes, risk control measures, future mitigations (or changes to existing risk control measures) may also be identified which could trigger an increase or a decrease in hazard scenario risk.

4. Cost benefit analysis, ALARP and tolerability

An organisation that requires an NRA to determine if an activity can or cannot go ahead, needs to define its position with respect to tolerability. Without this known state of risk acceptance, hazard scenarios (and their associated risk) cannot be determined as tolerable or intolerable. Tolerability must be approached from the perspective of the previously defined receptors of life, environment, port users and port/shipping infrastructure. This determination typically uses a standard five-by-five grid, one for each of the receptors, see Figure 2 (example). The NRA requires the Statutory Harbour Authority to determine its tolerability threshold (it not already defined).

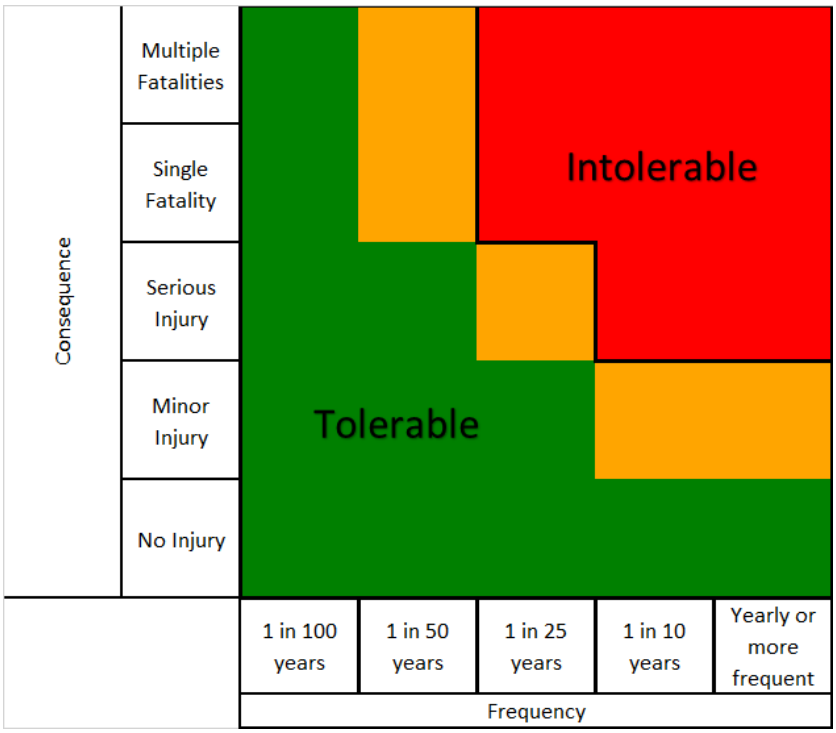


Figure 2: Five-by-Five tolerability grid (example)

If a risk is intolerable, it is imperative that controls are applied until the risk level is reduced or the operation is redesigned to eliminate or reduce hazards. The purpose of the Cost Benefit Analysis process ensures all risks are reduced to a position of ALARP, through the application of all 'reasonably practicable' controls. It is key to understand that 'tolerability' and ALARP are two separate terms in that an assessment may find that there are intolerable risks that are ALARP, or tolerable risks that are not ALARP.

5. Decision making process

As part of the Cost Benefit Analysis the Risk Assessment and Control Options are presented to those who have the appropriate authority to authorise or reject the proposed further applicable controls. This forms the final step of the assessment process.

If risks returned from the Cost Benefit Analysis are both ALARP and tolerable, then the decision-making process automatically recommends that the activity can be approved from a risk-based perspective. If a case occurs where all controls and mitigation measures are applied, and a risk is still intolerable then the organisation has three choices:

- Redesign the operation or process, to eliminate or reduced the outcome of hazards;
- Reject the operation or process; or
- Implement further and additional risk controls until tolerability and a position of ALARP are reached.

References

Department for Transport (DfT), 2018. A Guide to Good Practice on Port Marine Operations Prepared in conjunction with the Port Marine Safety Code 2016.

Department for Transport (DfT), 2016. Port Marine Safety Code. November 2016

International Maritime Organization (IMO) 2018. Revised Guidelines for Formal Safety Assessment (FSA) For Use In The IMO Rule-Making Process. Revision 2, 09 April 2018.

Maritime and Coastguard Agency (MCA), 2021. Marine Guidance Note (MGN) 654, Annex 1 'Methodology for Assessing Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREI)'. April 2021.

APPENDIX 4G: MATERIAL RESOURCES AND WASTE ASSESSMENT CRITERIA

APPENDIX 4G: Material Resources and Waste Assessment Criteria

The assessment of the level of environmental effect from the generation of waste and use of material resources will be made using the criteria in Table 1and Table 2, which are set out in the IEMA guidance.

Table 1: Sensitivity Criteria

Sensitivity of receptor	Criteria (Highest category applies where one of more criteria are met)
Very High	• Materials are known to be insufficient in terms of production, supply and/or stock; and/or comprise no sustainable features and benefits compared to industry-standard materials • Inert and non-hazardous waste baseline landfill void capacity is expected to reduce very considerably (by >10%)/end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand • Hazardous waste baseline landfill void capacity is expected to reduce very considerably (by >1%)/end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand
High	• Materials are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or comprise little or no sustainable features and benefits compared to industry-standard materials • Inert and non-hazardous waste baseline landfill void capacity is expected to reduce considerably by 6-10% as a result of wastes forecast • Hazardous waste baseline landfill void capacity is expected to reduce considerably by 0.5-1% as a result of wastes forecast
Medium	• Materials are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or are available comprising some sustainable features and benefits compared to industry-standard materials • Inert and non-hazardous waste baseline landfill void capacity is expected to reduce by 1-5% as a result of wastes forecast • Hazardous waste baseline landfill void capacity is expected to reduce by 0.1- 0.5% as a result of wastes forecast
Low	• Materials are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials • Inert and non-hazardous waste baseline landfill void capacity is expected to reduce by <1% as a result of wastes forecast • Hazardous waste baseline landfill void capacity is expected to reduce by <0.1% as a result of wastes forecast
Negligible	• Materials are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials* • Inert and non-hazardous waste baseline landfill void capacity is expected to remain unchanged or is expected to increase through a committed change in capacity • Hazardous waste baseline landfill void capacity is expected to remain unchanged or is expected to increase through a committed change in capacity

* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.

Table 2: Magnitude Criteria

Impact severity	Criteria (Highest category applies where one or more criteria are met)
Major	• The consumption of one or more materials is >10% by volume of the regional baseline availability; and/or more than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use • Inert and non-hazardous waste generated by the development will reduce regional landfill void capacity baseline by >10% • Hazardous waste generated by the development will reduce national landfill void capacity baseline by >1%
Moderate	• The consumption of one or more materials is between 6-10% by volume of the regional baseline availability; and/or one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use • Inert and non-hazardous waste generated by the development will reduce regional landfill void capacity baseline by 6-10% • Hazardous waste generated by the development will reduce national landfill void capacity baseline by <0.5-1%
Minor	• The consumption of one or more materials is between 1-5% by volume of the regional baseline availability; and/or the development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk • Inert and non-hazardous waste generated by the development will reduce regional landfill void capacity baseline by 1-5% • Hazardous waste generated by the development will reduce national landfill void capacity baseline by <0.1-0.5%
Negligible	• The consumption of no individual material type is equal to or greater than 1% by volume of the regional baseline availability • Inert and non-hazardous waste generated by the development will reduce regional landfill void capacity baseline by <1% • Hazardous waste generated by the development will reduce national landfill void capacity baseline by <0.1%
No change	• No consumption of materials is required • Inert and non-hazardous zero waste generation and disposal from the development • Hazardous zero waste generation and disposal from development

Table 3 provides definitions of effect thresholds which are set out in the IEMA guidance.

Table 3: IEMA Guidance Effect Thresholds

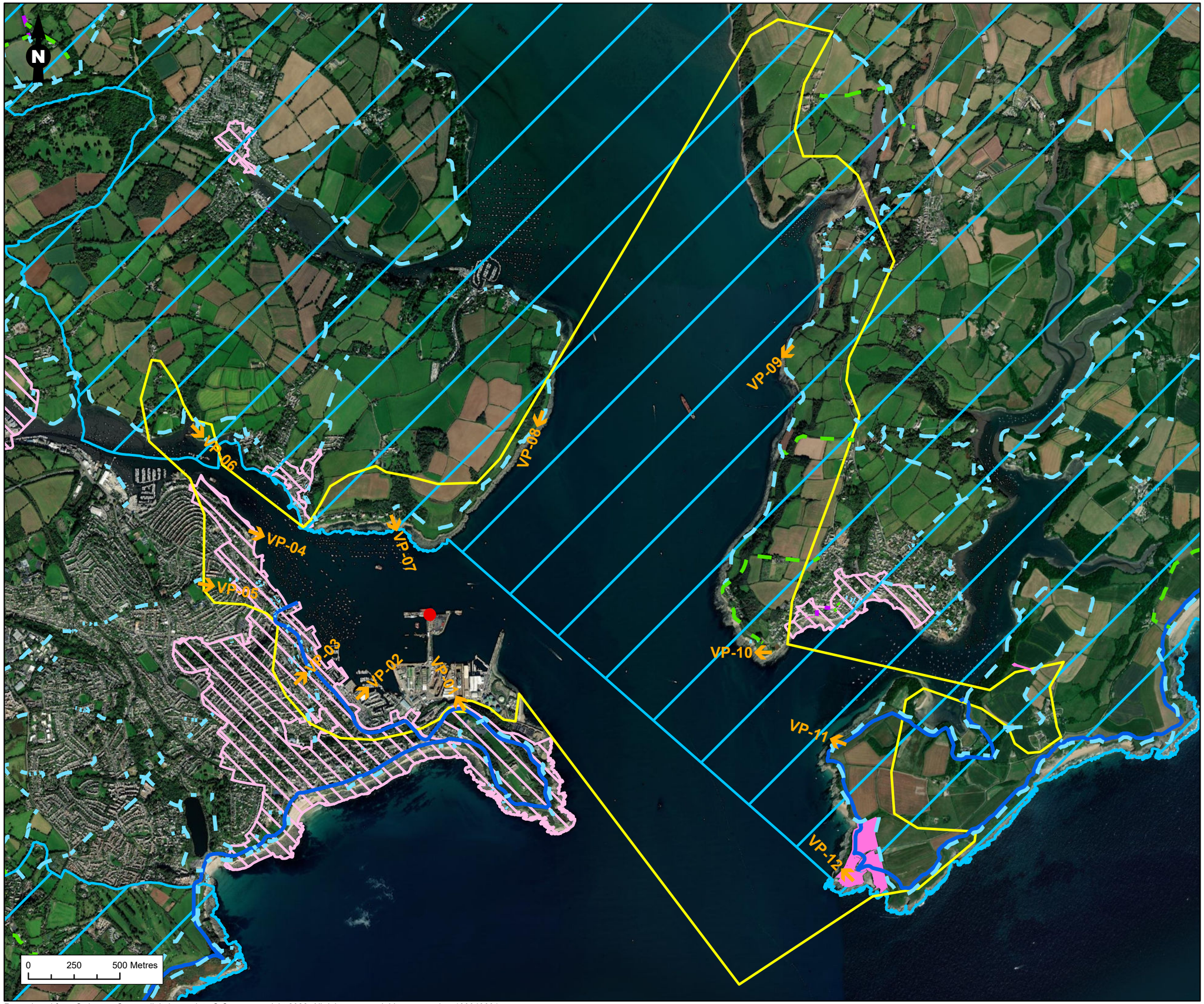
		Impact magnitude				
		Major	Moderate	Minor	Negligible	No change
Receptor value	Very High	Very large	Very large or Large	Large or Moderate	Slight	Neutral
	High	Very large or Large	Large or Moderate	Moderate or Slight	Slight	Neutral
	Medium	Large or Moderate	Moderate	Slight	Slight or Neutral	Neutral
	Low	Moderate or Slight	Slight	Slight or Neutral	Slight or Neutral	Neutral
	Negligible	Slight	Slight or Neutral	Slight or Neutral	Neutral	Neutral

Table 4 defines 'neutral' to 'very large' effect thresholds for both waste and material resources which are combined to determine the significance of effects associated with the proposed development. The proposed development can therefore be defined as significant or not significant.

Table 4: Significance Criteria for Waste and Materials

Effect	Waste	Materials
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

APPENDIX 4H: LANDSCAPE, SEASCAPE AND VISUAL AMENITY FIGURE



Legend

- Site Location
- Representative Viewpoint
- Byway
- Bridleway
- Footpath
- Restricted Byway
- South West Coast Path
- CRoW Access Land
- Zone of Visual Influence
- Cornwall Area of Outstanding Natural Beauty
- Falmouth Conservation Area

Figure Title
Landscape, Seascape, and Visual Amenity Scoping Context

Project Name
Falmouth Docks Development

Project Number	Figure No.
1620012132	20-1
Date	**Prepared By**
September 2022	IL
Scale	**Issue**
1:25,000 @A3	1

Client **Falmouth Docks & Engineering Company**

RAMBOLL

APPENDIX 4I: LANDSCAPE, SEASCAPE AND VISUAL AMENITY SIGNIFICANCE CRITERIA

APPENDIX 4I – Landscape, Seascape and Visual Amenity Assessment Criteria

For each character area and representative viewpoint, the following will be described:

- Nature of the receptor (sensitivity): Covering value, importance, and susceptibility in relation to development of the type proposed.
- Nature of effect (magnitude): Arising as a result of the Proposed Development regarding probability, reversibility, spatial extent, and temporal aspects (construction, winter, summer, and night).

The sensitivity scale used for landscape, seascape and visual receptors is described in Table 1. The descriptions are not extensive but provide an illustration of the nature of the receptor associated with each element of the scale. Professional judgment is applied when determining the appropriate level of sensitivity for each receptor.

Table 1: Sensitivity Criteria

Sensitivity	Landscape/Seascape	Visual
Low	High capacity to accommodate development of the same type, scale, and appearance as the Proposed Development. An area of poor quality or condition. Is locally abundant and has few or no distinguishing or designated features.	A view that is characterised by features of the same type, scale, and appearance as the Proposed Development. A view that has little visual amenity or interest, or of a townscape with poor condition. A view that is temporary, short-term, incidental, or experienced at speed. A view experienced by people in their place of work.
Medium	Locally valued for its character, features, and sense of place. High quality or condition, potentially including some designated features such as Tree Preservation Order or Listed Buildings. Strong cultural associations.	A positive view experienced by people during leisure activities such as sports, walking, cycling. A view that has specific local value but is not recognised by designation in local planning or guidance. A positive view experienced in passing by large numbers of people in passing from transport corridors
High	Value or character is recognised through national or local designation (within, or predominantly within a Conservation	A view recognised by designation in local planning policy or guidance.

Sensitivity	Landscape/Seascape	Visual
	Area or Registered Park and Garden, or a high proportion of Listed Buildings, Ancient Woodland). Consistently high quality and condition offers strong scenic value. A rare example of a specific style of landscape or townscape character. Little capacity to accommodate development of the same type, scale, and appearance as the Proposed Development.	A positive view experienced by residents, or large number of visitors/recreational users. Static views towards important local features, landmarks, or buildings. Views that are characterised by features that contrast with the type, scale, and appearance of the Proposed Development.

The magnitude scale used to identify the change experienced by townscape and visual receptors resulting from the Proposed Development is described in Table 2. Except for Neutral, change can be judged as positive (beneficial) or negative (adverse). The descriptions are not extensive but provide an illustration of the nature of the change associated with each element of the scale. Professional judgment is applied when determining the appropriate magnitude for each receptor.

Table 2: Magnitude Criteria

Magnitude	Townscape	Visual
No Change/Negligible	No perceptible change to the townscape character. Small change to perceptual/physical aspects within a limited extent of the townscape.	No perceptible change to the overall view.
Minor	A small change resulting from the Proposed Development, that may be incongruous, whilst retaining the overall character and quality of the wider townscape area. A notable change to the townscape area resulting from the Proposed Development that is in-keeping with the surrounding character.	A change that is visible but will not be immediately apparent to the casual viewer. A change that is visible but accords with the overall nature and amenity of the existing view.
Moderate	A notable change resulting from the Proposed Development that is incongruous with the surrounding character.	A notable change within a small proportion of overall view. The addition or removal of a key component of the view.

Magnitude	Townscape	Visual
Major	The Proposed Development will result in the loss/addition of a valuable component of the townscape. The Proposed Development will result in a large-scale change to the character of the area. The Proposed Development will conflict with the character of the wider area and exert a large influence upon it.	A complete change to the nature of the view. Addition of a feature within part of the view that influences the perception and amenity of the wider view.

The level of effect of the Proposed Development on each receptor, resulting from a combination of the nature of the receptor and the nature of the change, is determined using the matrix in Table 3. Effects can be adverse or beneficial.

Table 3: Significance Criteria

		Sensitivity		
		Low	Medium	High
Magnitude	No change / Negligible	Neutral	Neutral	Neutral
	Minor	Neutral	Neutral/Slight	Slight
	Moderate	Slight	Slight/Moderate	Moderate
	Major	Slight	Moderate	Large

APPENDIX 4J: MAJOR ACCIDENTS AND DISASTERS SCREENING ASSESSMENT

APPENDIX 4J: Major Accidents and Disasters Screening Assessment

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
Natural					
Biological Hazards: Epidemics, Animal/Insect Infestation	No There are no identified biological hazards located within the site or the site surrounds.	Not applicable	N	No Given the nature of the proposed development, it is not anticipated that a major accident or disaster associated with biological hazard would be caused.	N
Mass movements, landslides, rock falls	No Given the location of the site, there are no identified risks associated with mass movements, landslides and rockfall hazards.	Not applicable	N	No Given the nature of the proposed development, it is not anticipated that a major accident or disaster associated with mass movements, landslides or rockfalls would be caused.	N
Earthquakes	No The historical and geological evidence for earthquakes in the UK suggests a low risk of earthquakes. Falmouth is	Yes The proposed development is considered to be resilient to the risks presented by earthquakes in the region; in the unlikely	N	No Given the nature of the proposed development and the nature of this type of	N

Major Accident or Disaster	Is the/will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
	located within a region of low to very low seismic risk[1].	event that these occur they are considered to be low magnitude events due to the location of the site in a low seismic zone.		hazard, it is not anticipated that a major accident or disaster associated with earthquakes would be caused.	
Tsunamis	No The historical and geological evidence for tsunamis in the UK suggests a very low risk of tsunamis. Falmouth is located within a region of low risk to tsunamis.	Yes The proposed development is considered to be resilient to the risks presented by tsunamis in the region; in the unlikely event that these occur they are considered to be low magnitude events due to the geology of the UK and location of the site.	N	No Given the nature of the proposed development and the nature of this type of hazard, it is not anticipated that a major accident or disaster associated with tsunamis would be caused.	N
Volcanic Eruptions	No There are no active volcanoes within the UK or its immediate vicinity. Falmouth is located within a region of very low/no risk of direct impacts due to volcanic eruptions. Disruption may occur to aviation and other logistics due to volcanic activity elsewhere.	Not applicable	N	Not applicable	N

[1] BG, 2022. BGS MapViewer: GeoIndex (onshore), online. Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [Accessed 10/10/2022]

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
Severe Weather – Storms	Yes There is potential for severe storms. The southwest coast of the UK is known to experience strong storms due to exposure to the prevailing south westerly winds. Effects of climate change may also have the potential to increase the incidence of severe storms in the future.	Yes The proposed development is considered to be resilient to storms through the implementation of design standards with an inclusion of climate change allowances that accommodate for greater storm events in the future. Strong winds associated with storm events will be factored into the design of the proposed development in respect of structural integrity and appropriateness of any above deck features.	Y	No The design of the proposed development will incorporate results from modelling the hydrodynamic regime at Falmouth Docks, including the potential impact the development may have on surrounding waters and infrastructure to ensure that the risk of storm events is not increased.	N
Severe Weather - Droughts	Yes There is the potential for prolonged periods of low rainfall. Effects of climate change may also have the potential to increase incidence of drought in the future.	Yes Due to the nature of the proposed development, it is not considered to be vulnerable to current and future potential drought conditions.	N	No Given the nature of the proposed development and the nature of this type of hazard, it is not anticipated that a major accident or disaster associated with drought would be caused.	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
Severe Weather – Extreme Temperatures	Yes There is the potential for prolonged periods of extreme temperatures. Effects of climate change may also have the potential to increase incidence of drought in the future.	Yes Due to the nature of the proposed development, it is not considered to be vulnerable to current and future potential extreme temperature conditions.	N	No Given the nature of the proposed development and the nature of this type of hazard, it is not anticipated that a major accident or disaster associated with extreme temperatures would be caused.	N
Floods	Yes There is the potential for flooding to occur. Effects of climate change may also have the potential to increase incidence of flooding in the future.	Yes The proposed development is required to be water compatible and therefore resilient to flooding through the implementation of design standards with an inclusion of climate change allowances that accommodate for greater flooding in the future. Flood risk will be considered within the supporting FRA, where assessment methodologies and best-practice mitigation measures will be outlined.	Y	No The design of the proposed development will consider the potential to increase the flood risk of adjacent infrastructure and receptors.	N
Wildfires	No	Not applicable	N	Not applicable	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
	Land types most at risk of wildfires include forests, heathland and agricultural crops. None of these are present within the site.				
Severe Space Weather	No Space weather is associated with solar activity causing magnetic storms affecting the Earth's upper atmosphere. This can cause disturbance to communications and power lines. The proposed development is not vulnerable to these effects beyond vulnerability of the national infrastructure, which is beyond the scope of this assessment.	Not applicable	N	Not applicable	N
Man-Made					
Poor Air Quality Events	No No reference to poor air quality events at the site has been found.	Not applicable	N	No Air quality emissions that would cause a major accident and/or disaster (i.e., emissions that would exceed those assessed within the EIA and would	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
				require management beyond measures already identified for all stages of the proposed development) are not considered likely.	
Water Contamination and Release of Contaminants	Yes Due to the longstanding history of the site as an operational port, isolated instances of accidental water contamination have occurred, and there is potential to encounter contaminates within sediment on the seabed however these are not considered to be of a scale that would constitute a major accident or disaster. The presence of Falmouth Petroleum on site also presents an additional risk of contaminants being released from site into the surrounding water environment. There is potential to encounter contamination, including asbestos,	Yes The site has protocols in place to address water contamination events and all users of the site adhere to these procedures. The development and its operations are not considered to be vulnerable to water contamination. GI works and asbestos surveys on buildings and structures proposed to be demolished (if required) would record the potential presence of any contaminants and identify appropriate ways to remove / manage them before demolition and construction works begin. Falmouth Petroleum and associated bunkering storage facilities on site are operated by World Fuels and are operated under the COMAH regulations. These are	Y	No Demolition and construction works would be managed under an appropriate Construction Environmental Management Plan (CEMP) to prevent water contamination incidents. The nature of the site operations requires stringent water quality management measures to be in place under the MARPOL Regulations[2]. These measures are considered sufficient and proportionate to prevent a major accident	N

[2] International Maritime Organisation, 2022. International Convention for Prevention of Pollution from Ships (MARPOL), online. Available at: https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx [Accessed 10/10/2022]

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
	within terrestrial elements of the site which were likely to be constructed using asbestos containing materials.	considered sufficient to manage the risks of contaminant release.		or disaster through water contamination.	
Transport Accidents (Marine and Terrestrial)	Yes The site is a busy port with frequent vessel movements alongside vehicle movements associated with the cruise industry. Major accidents of this nature are infrequent but are possible.	Yes Marine transport accidents are managed through the implementation of safety protocols as required by the port under their powers as Harbour Authority. Safety protocols are well-established and are considered effective to be resilient to transport accidents. Navigation risks during both the demolition and construction and the completed development stages will be addressed within the ES and supporting assessments. Terrestrial transport accidents associated with other road networks are not considered to affect the proposed development.	Y	No Transport accidents that would cause a major accidents or disaster (i.e., incidents on a scale beyond those assessed within the EIA and would require further management beyond measures already identified for all stages of the development) are not considered likely. The design of the proposed development considers the existing navigational risks present for users of the site and future navigation risks of the proposed development for users of the site and its surroundings; the design is considered to	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
				improve navigational safety through removal of the 'dogleg' caused by the Northern Arm which will be removed to ensure the manoeuvrability of all vessels.	
Industrial Disruptions and Accidents	Yes The nature of the site is industrial ship building and repairs.	Yes Due to the nature of the site, stringent management measures are in place to fulfil legal and safety requirements as an operational port. These measures are considered to provide sufficient resilience to and prevention of industrial accidents.	N	No Given the nature of the proposed development, it is not anticipated to introduce further sources of infrastructure that would contribute to cause industrial accidents.	N
Nuclear Accidents	No There is no nuclear activity within or in the vicinity of the site.	Not applicable	N	No Given the nature of the proposed development, it will not introduce any sources of nuclear material or activity and would not cause a major accident	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
				associated with nuclear activity.	
Utility and Sewerage Failures	Yes The site is currently connected to the local utility and sewerage services and the proposed development will require the same connections to remain, therefore the site remains vulnerable to any failures to local utility and sewerage failures. A number of substations are present on site which remain the responsibility of the site	Yes Utility service connections will either be maintained or installed in consultation with service suppliers to ensure that they meet the proposed development requirements and identify the need for any further contingency and protection measures. Utility failure (such as electricity, gas, water supply or sewerage) will be avoided through appropriate design and sufficient consultation with utility providers, ensuring that necessary repairs can be undertaken, and continuation of supply ensured. The proposed upgrades to utility provision as part of the proposed development are considered to improve utility provision at the site.	N	No Given the nature of the proposed development, it is not anticipated that it would cause any utility failures and associated major accidents or disasters.	N
Fire Risks	Yes Fire constitutes a significant threat to life and infrastructure I all urban areas; the site is located adjacent to	Yes The site operates under all required Fire Safety and HSE requirements, and the adjacent Falmouth Petroleum is also	Y	No The proposed development would not introduce an additional fire risk and	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
	the COMAH identified Falmouth Petroleum which presents an additional risk.	considered to operate under these regulations to demonstrate compliance with the relevant UK laws and COMAH Regulations. Urban fires will be mitigated through appropriate design of any buildings in accordance with Building Regulations and relevant safety guidance, in addition to the established 999 emergency response procedures in place in Falmouth and Cornwall. These measures will remain in place for the proposed development and are considered to provide resilience to the threat of fire.		therefore existing fire safety protocols are considered sufficient to manage the risks of a major accident and disaster associated with fires.	
Famine and Food Insecurity	No There are currently no risks of famine and food insecurity of a major accident and disaster scale in Falmouth, or the UK.	Not applicable	N	No Given the nature of the proposed development, it is not anticipated that it would cause any accidents or disasters associated with famine and food insecurity.	N
Terrorist Incidents	Yes Due to the perceived strategic importance of the site, it could be	Yes Navigational safety measures in place for the site would be maintained throughout	N	No Given the nature of the proposed development to	N

Major Accident or Disaster	Is the/ will the Proposed Development or the site surrounds be exposed to the major accident or disaster?	Is the Proposed Development or the site surrounds resilient to the major accident or disaster?	Considered in EIA Scoping?	Does the Proposed Development have the potential to create a major accident or disaster?	Considered in EIA Scoping?
	Reason	Reason	Y/N	Reason	Y/N
	considered as vulnerable to terrorist incidents, notably during public events of global importance.	all stages of the proposed development, this would include measures to detect any perceived threats to safety (i.e., unscheduled vessels and/or vessels not following protocol). The site is security controlled from the landside access points. Specific safety measures would be implemented as appropriate when public events are planned.		strengthen and maximise the existing uses of the site, major accidents associated with terrorist incidents are not considered to be caused or increased by the proposed development.	
Displaced Populations	No There are currently no risks of displaced populations of a major accident and disaster scale in Falmouth, or the UK.	Not applicable	N	No Given the nature of the proposed development, it is not anticipated that it would cause any accidents / disasters associated with displaced populations.	N