MARINE LICENCE CML2365

CONDITION 3.25: CEMP#2 – ACTIVITY 1, CABLE LAYING AND PROTECTION PHASE 2

Liverpool Bay CCS Project

Marine and Coastal Access Act 2009

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1. INTRODUCTION

1.1. SCOPE AND PURPOSE

1.1.1. This document is the **Construction Environmental Management Plan #2 (CEMP #2)** for the pre-lay grapnel run, boulder clearance, and pre-trenching along the cable routes, and pre-lay mattress installation at cable crossings provides information to fulfil the requirements for the partial discharge of **Condition 3.25** of Marine Licence **CML2365**.

1.1.2. These preparatory works, to be carried out in April and May 2026, will represent **Phase 2** of **Licenced Activity 1** (cable installation and protection). **Activity 1** has sub-activities that will be carried out in sequence, which are set out below and in **Table 1.1** and highlighted by blue shading.

1.1.3. This document is **CEMP #2** and is the second in a sequence of three required CEMPs phased in line with the planned programme of works for **CML2365 Activities 1–5**, as follows:

- **Activity 1 (Cable laying and protection)** will require three separate CEMPs reflecting its delivery in three phases.
  - **CEMP #1 submitted in October 2025**, ahead of the Phase 1 works (HDD exit pit cofferdam on Talacre Beach, and the conduit pipe installation), scheduled for February and March 2026. These works form the Offshore element of an Onshore HDD under Gronant Dunes.
  - **CEMP #2 submitted in January 2026**, in advance of the Phase 2 works, which comprise the preparatory works for cable installation, including laying the third-party crossing protection, starting in April 2026, in advance of the Phase 3 (CEMP #3) cable laying works in mid-2026, and mid-2027.
  - **CEMP #3 will follow in February 2026**, in advance of the Phase 3 works, which comprise re-opening of the HDD exit pit cofferdam and beach preparation planned for June–July 2026, and the subsequent cable-lay and protection campaigns from PoA to New Douglas in mid-2026, and New Douglas to satellites in mid-2027.
- **Activity 2 (Pipeline spool laying and protection)** will be included in CEMP #3, to be submitted in February 2026, ahead of the offshore pipeline spool installation window in June–August 2027.
- **Activity 3 (Clearance of unexploded ordnance)** is unlikely to be required and would not currently require a CEMP. This is because survey results indicate no UXO clearance is needed prior to installation of any of the activities covered by CML2365.
- **Activity 4 (Installation of the New Douglas CCS Platform and pipeline repurposing) will be supported by** CEMP #3**, due in** February 2026**, six months before the scheduled September 2026 installation.**
- **Activity 5 (Removal of dropped objects)** does not require a CEMP, as it will be managed in accordance with the Liverpool Bay CCS Limited Dropped Objects Plan (DOP), which applies to all five licenced activities throughout the 25-year project duration. The DOP has been included as an Appendix to each CEMP, and a summary of its key requirements presented within the main text.

1.1.4. In summary, **Table 1.1** shows that three CEMPs (**CEMPs #1–#3**) will be prepared and submitted in advance of key construction stages for the Marine Licensable Activities in Welsh Waters, ensuring alignment between environmental management and the staged programme of offshore works.

Table 1.1 Indicative timetable for phased CEMP submission for CML2365 Condition 3.25

Licence Activity	Sub-activity	Installation Dates	CEMP submission date
Activity 1 – Cable laying and protection (Phase 1)	• HDD under Gronant Dunes and conduit pipe installation.	February and March 2026	**CEMP #1** – October 2025
	• HDD Exit pit cofferdam, conduit sump, and conduit pipe bonding/welding.		
Activity 1 – Cable laying and protection (Phase 2)	• Pre-lay grapnel run for all cables. • Pre-laying third-party crossing protection for PoA to New Douglas cable. • Pre-laying third-party crossing protection for New Douglas to satellites cables.	April 2026	**CEMP #2** – January 2026
Activity 1 – Cable laying and protection (Phase 3)	• Re-opening of HDD Exit pit cofferdam, beach preparation, and cable shore pull.	June-July 2026	**CEMP #3** – February 2026
	• PoA to New Douglas cable lay and post-lay protection.		
	• New Douglas to satellites inter-platform cable lay and post-lay protection.	July 2027	
Activity 2 – Pipeline spool laying and protection	• Installation of new sections of pipeline spools to connect the new Douglas CCS platform to the existing subsea natural gas pipelines. • Installation of concrete mattresses and external rock protection on sections of pipeline.	June-August 2027	**CEMP #3** – February 2027
Activity 3 – Clearance of Unexploded Ordnance (UXO)	• Clearance of a maximum of twelve UXOs within the Licensed Area. The UXO clearance will be undertaken during daylight hours only.	Survey results currently indicate that UXO clearance will not be required prior to installation of any LB CCS infrastructure.	**No CEMP** required
Activity 4 - Installation of the New Douglas Carbon Capture and Storage (CCS) Platform and connecting to/repurposing existing pipelines	• Installation of a new Douglas CCS Platform to the northwest of the exiting Douglas complex platform. • The installation of the new Douglas CCS platform will include up to eight driven piles. • Repurposing of the existing subsea natural gas pipelines for their change of use from hydrocarbon to CO_2 service.	September 2026	**CEMP #3** – February 2026

Licence Activity	Sub-activity	Installation Dates	CEMP submission date
Activity 5 - Removal of accidentally dropped objects pursuant to condition 3.7	• As approved by the Licensing Authority under condition 3.7	Across 25-year project lifetime.	**Incorporated within each CEMP** – Activity addressed in Dropped Objects Plan (DOP) relevant to the activities within each of the three CEMPs.

1.1.5. This **CEMP#2** consolidates all applicable Marine Licence conditions, encompassing pollution prevention measures, equipment maintenance standards, refuelling protocols, unexploded ordnance procedures, marine archaeological considerations, and the management of invasive non-native species. It incorporates references to specific sections and appendices detailing plans such as the **Invasive Non-Native Species Management Plan**, **Marine Pollution Contingency Plan**, and the **Written Scheme of Investigation** for archaeological matters.

1.1.6. The CEMP is designed to prevent unacceptable environmental impacts by ensuring thorough planning and implementation of works. This approach incorporates mitigation measures, compliance audits, and provides assurance to third parties throughout project delivery.

1.1.7. Alongside **Condition 3.25**, other conditions are addressed within different sections of this **CEMP #2**. **Table 1.2** indicates where information required by each condition can be found in this **CEMP #2**.

Table 1.2 Marine Licence CML2365 Requirements in CEMP #2

Reference	Requirement	Location
Condition 3.10 Notified Contractors, Vessels and/or Vehicles only to Carry out Licensed Activities	Only those agent(s), contractor(s), sub-contractor(s), vessels and/or vehicles whose details have been notified to the Licensing Authority may operate under the terms of this Licence. Any changes must be notified to and be approved by the Licensing Authority in writing prior to any such agent, contractor, subcontractors or vehicles carrying out any Licensed Activities pursuant to or otherwise operating under this Licence.	**Section 3.1:** Roles, Responsibility and Authority
Condition 3.11 Refuelling of Plant and Equipment	The Licence Holder must ensure that plant, vehicles and machinery are not refuelled on the foreshore or in the sea.	**Section 4.2** Fuel Storage and Refuelling
Condition 3.12 Equipment, Structures and Access	The Licence Holder must ensure that all equipment, temporary structures, access tracks, waste and/or debris associated with the Licensed Activities are removed on completion of the Licensed activities.	**Section 4.3:** Waste Management Plan
Condition 3.14 Pollution Prevention	The Licence Holder must ensure that pollution prevention best practice is adhered to at all times. Any incidents must be reported to the Licensing Authority as soon as possible using the hotline number **0300 065 3000**.	**Section 4.3:** Marine Pollution contingency Plan
Condition 3.15 Spillage of Pollutants	The Licence Holder must employ bunding, storage facilities and spill kits to contain and prevent the release of fuel, oils and chemicals associated with the plant, refuelling and construction equipment into the marine	**Section 4.3:** Marine Pollution contingency Plan

Reference	Requirement	Location
	environment. Secondary containment must be used with a capacity of no less than 110% of the container's storage capacity	
Condition 3.16 Prevention of Disposal of Man-made Debris	The Licence Holder must ensure that all reasonable precautions are taken to prevent the disposal of man-made debris to the marine environment. Such material must be removed immediately and be disposed of appropriately. If it is not possible to prevent manmade debris from entering the marine environment during the Licensed Activities, the Licensed Activities must cease immediately.	**Section 4.3** Waste Management Plan
Condition 3.17 Cleanliness of Equipment	The Licence Holder must ensure that equipment, machinery and PPE are washed with freshwater and/or thoroughly airdried before deployment and before moving between locations.	**Appendix C:** Invasive Non-Native Species Management Plan.
Condition 3.23 Unexploded Ordnance (UXO) Method Statement	The Licence Holder must submit an UXO Method Statement to the Licensing Authority for written approval **at least 4 months** prior to commencement of Licensed Activity 3. No Licensed Activities relating to Licensed Activity 3 may be undertaken prior to written approval from the Licensing Authority.	Survey results currently indicate that UXO clearance will not be required prior to installation of any LB CCS infrastructure.
Condition 3.24 Marine Archaeology	The Licence Holder must submit a **Written Scheme of Investigation (WSI)** which shall be in accordance with the outline WSI (CML2365-LBA CCS Ltd_OFFSHORE ES_Appendix U WSI_NRW_FINAL) to the Licensing Authority for written approval at least **4 months** prior to commencement of the Licensed Activities. No Licensed Activities may be undertaken prior to written approval from the Licensing Authority. The Licence Holder must submit a **Protocol for Archaeological Discoveries (PAD)** to the Licensing Authority for written approval at least 4 months prior to commencement of the Licensed Activities. No Licensed Activities may be undertaken prior to written approval from the Licensing Authority.	**Section 4.6:** Marine Archaeology **Appendix D:** Written Scheme of Investigation – WSI.
Condition 3.25 Construction Environmental Management Plan (CEMP)	The Licence Holder must submit a CEMP to the Licensing Authority for written approval at least **4 months** prior to commencement of the Licensed Activities. No Licensed Activities may be undertaken prior to written approval from the Licensing Authority. The CEMP must:	This document: **CEMP #2:** Activity 1 – Cable laying and protection.
	3.25 (i) be in accordance with the Outline Environmental Management Plan (CML2365-LBA CCS Ltd_OFFSHORE ES_Appendix R EMP_NRW_FINAL)	
	3.25 (ii) be in accordance with the Outline Invasive Non-Native Species Management Plan (INNSMP) (CML2365-LBA CCS Ltd_OFFSHORE ES_Appendix T INNS_NRW_FINAL)	**Appendix C:** Invasive Non-Native Species Management Plan.
	3.25 (iii) include a Marine Pollution Contingency Plan containing planning for accidental spills, address all potential contaminant releases and include key emergency contact details	**Section 4.3:** Marine Pollution Contingency Plan
	3.25 (iv) include measures to reduce vehicle disturbance to benthic habitats while working in the intertidal area, and	**Not Applicable**

Reference	Requirement	Location
	3.25 (v) include measures to minimise disturbance to birds while working in or near the intertidal area	Not Applicable
Condition 3.33 Post Construction As-Built Report	The Licence Holder must provide to the Licensing Authority the following information within 4 months of completion of the Licensed activity for written approval: (i) Confirmation of construction completion date; (ii) As built plans, and (iii) Latitude and longitude coordinates of the New Douglas Carbon Capture and Storage (CCS) Platform provided as Geographical Information System data referenced to WGS84 datum.	The preparation and submission for approval of the required 'As-Built' information will be phased in line with the planned programme of works for Licenced Activities 1–5, as set out in Table 1.1. Therefore, on completion of the cable laying and post lay mattresses 'as-built' information for Activity 1, covered by CEMP #3, will be provided to the Licensing Authority.

1.2. AIM AND OBJECTIVES

1.2.1. The aim of this CEMP #2 is to ensure that the works outlined in this document do not result in unacceptable environmental effects. It will set out how the works will be managed to reduce, avoid and mitigate adverse effects. In particular, the CEMP #2 shall:

- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental effects are implemented;
- Provide assurance to third parties that their requirements with respect to environmental performance will be met; and
- Provide a framework for compliance auditing and inspection to enable the Project to be assured that its aims with respect to environmental performance are being met.

1.3. STATUTORY GUIDANCE AND BEST PRACTICE

1.3.1. Access to this CEMP #2 will be provided to each person working on behalf of the Boskalis Subsea Cables. The Boskalis Subsea Cables will maintain a copy of the CEMP #2 at all work site offices for reference by the entire workforce. It will be accessible to all site personnel and representatives of the relevant enforcement Authority, and all Subcontractors. All site works shall be undertaken in compliance with this CEMP #2 and with all applicable legal and regulatory requirements. Boskalis Subsea Cables will take responsibility that their works do not contravene legal requirements, and adherence to this CEMP #2 alone cannot be a full defence regarding legal action against Boskalis Subsea Cables.

1.3.2. Boskalis Subsea Cables shall comply as necessary with the Construction (Design and Management) Regulations 2015 (CDM) and shall comply with all the applicable pollution control regulations in which case the Boskalis Subsea Cables shall obtain and keep current any necessary consent, authorisation, approval or permission.

1.3.3. Boskalis Subsea Cables shall, where relevant, undertake all site works in accordance with current guidance and best practice.

1.4. ENVIRONMENTAL MANAGEMENT SYSTEM

1.4.1. This CEMP #2 has been produced in accordance with principals outlined in BS EN ISO14001:2015. Boskalis Subsea Cables will mirror the Liverpool Bay CCS Limited environmental values and standards including the promotion of these values and standards among their staff, subcontractors, and suppliers engaged on the works. Boskalis Subsea Cables can demonstrate the principles of BS EN ISO 14001:2015 and has an Environmental Management System (EMS) certified to the standard.

1.5. INTERFACES AND ASSOCIATED DOCUMENTS

1.5.1. The considerations, mitigation and measures that are described in this CEMP are informed by relevant assessments and descriptions contained within the Offshore Environmental Statement (ES) that supported the Marine Licence (CML2365) application. The relevant ES chapters are as follows:

- ES Volume 2, Chapter 4: The Proposed Development;
- ES Volume 2, Chapter 7: Other marine users; and
- ES Volume 2, Chapter 13: Shipping and navigation.

1.5.2. This CEMP also interfaces with several other management plans, and method statements. It has been drafted to be consistent with the timings, approaches and controls set out in the preconstruction plans and documents submitted for approval under Marine Licence CML2365. Specifically, implementation of the CEMP will require interface with the following Management Plans, which are all Activity-specific Conditions of Marine Licence CML2365:

- Vessel Management Plan (VMP), as required in Condition 3.27; and
- Navigation and Safety Plan (NSP), as required in Condition 3.29.

1.5.3. Regarding the 'cable crossing and working agreements', as required in Condition 3.31., an application to vary CML2365 has been made to remove this condition. This is because some third-party asset owners have been unresponsive to the exchange of draft agreements by Liverpool Bay CCS Limited.

1.5.4. On completion of the activities LB CCS Limited will undertake the following:

- Compass Deviation Survey, as required in Condition 3.28;
- Installed Cable and Pipeline Report, as required in Condition 3.32; and
- Post Construction As-Built Report, as required in Condition 3.33.

2. CONSTRUCTION ACTIVITIES AND PROGRAMME

2.1. ACTIVITY LOCATION AND DESCRIPTION

2.1.1. The pre-lay activities will be carried out in Liverpool Bay, in preparation for where the four new electrical cables for the Liverpool Bay CCS Project cross existing pipelines and cables. There will be four main pre-lay activities:

- pre-lay boulder relocation;
- pre-lay grapnel run;
- pre-trenching, and
- pre-lay mattress installation.

2.1.2. These activities are detailed in the following sections.

2.1.3. Pre-lay mattress installation will be undertaken to stabilise the seabed and provide protection at third-party cable crossings along the planned cable route. The third-party cables are export cables and inter-platform cables associated with the Burbo Bank, North Hoyle, and Gwynt y Mor offshore wind farms, and the Western Link HVDC cables, as shown in Figure 2-1.

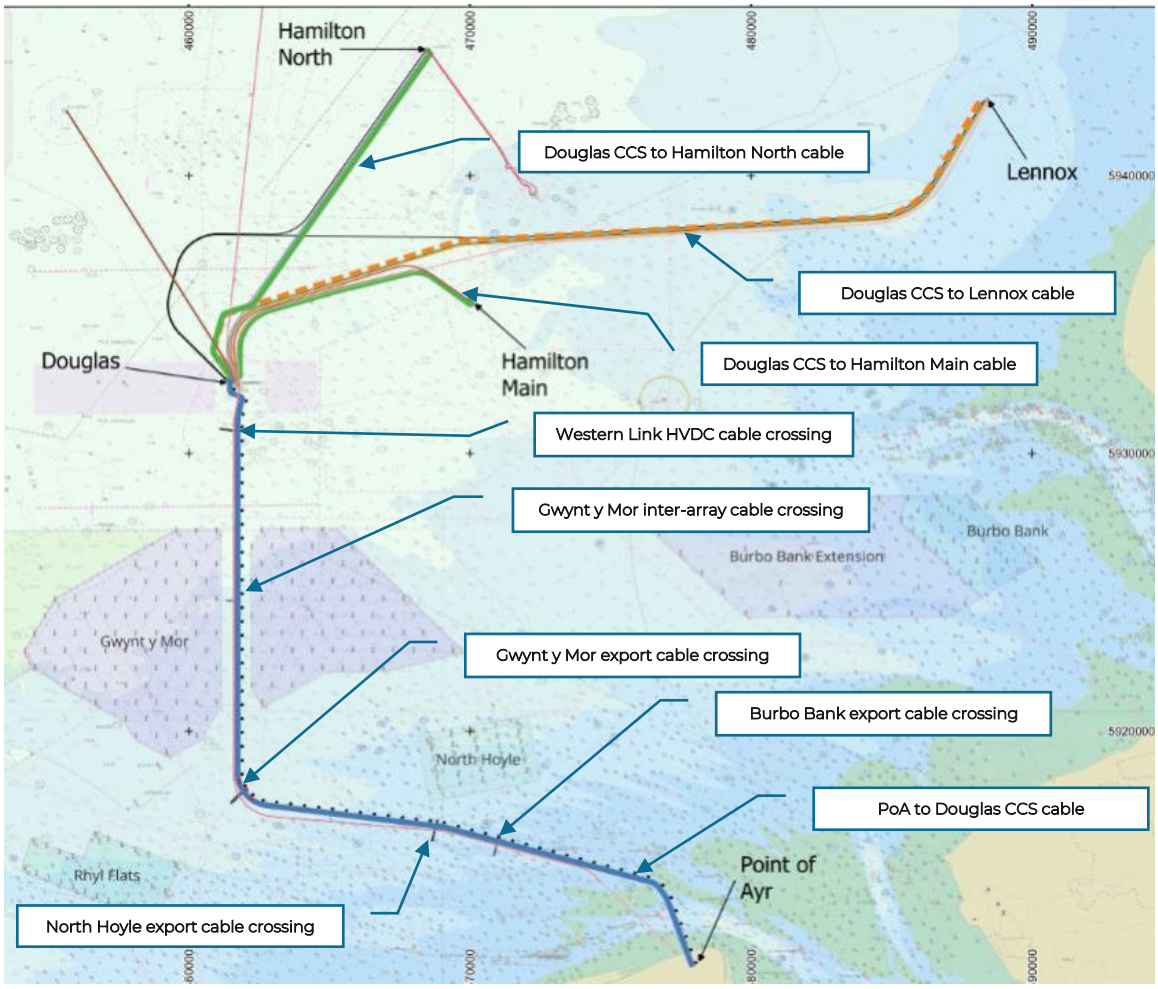


Figure 2-1: Location of cables and crossings for pre-lay activities

2.1.4. The existing pipelines crossed are located close to the new Douglas CCS platform, within the 500m exclusion zone. These comprise a variety of pipelines formerly used to transport oil, natural gas, condensate, produced water, and methanol.

2.2. GENERAL PRINCIPLES

2.2.1. This Construction Environmental Management Plan (CEMP#2) sets out the environmental protection principles governing pre-lay grapnel runs (PLGR), pre-lay boulder relocation (PLBR), pre-lay mattress installation and a pre-trenching activity as a preparatory work for the cable laying burial activity undertaken in support of the cable works licensed under Marine Licence CML2365.

2.2.2. All pre-lay seabed preparation activities will be carried out in full compliance with the Marine and Coastal Access Act 2009, the approved Environmental Statement and supporting documents, and the conditions of Marine Licence CML2365, as issued by Natural Resources Wales (NRW).

2.2.3. Environmental impacts will be managed through a clear hierarchy of avoidance, minimisation, and mitigation, with seabed disturbance restricted to the minimum necessary to safely install mattresses. PLGR will be limited to essential clearance of obstructions, boulder relocation will only occur where required, and mattress installation will be confined to licensed locations and quantities.

2.2.4. A precautionary approach will be applied throughout the works. The Offshore Environmental Manager will have authority to modify or stop activities if unexpected environmental sensitivities or risks are identified. All operations will comply with licence restrictions on timing, depth reduction, pollution prevention, biosecurity, and protection of marine ecology.

2.2.5. Robust procedures for pollution prevention, dropped object management, monitoring, record keeping, and reporting will be implemented. Any incidents, non-compliances, or deviations from approved methods will be promptly reported to NRW. Where monitoring indicates impacts greater than predicted, adaptive management will be applied, with mitigation measures reviewed and updated subject to regulatory approval.

2.2.6. This CEMP#2 provides assurance that pre-lay seabed preparation works will be undertaken in a controlled, environmentally responsible manner, fully aligned with the requirements and intent of Marine Licence CML2365.

2.2.7. On completion of the licenced activities, Notification within 10 days will be given to the Licensing Authority (NRW) and UKHO so charting can be updated.

2.3. COMBINED VESSEL MANAGEMENT PLAN AND NAVIGATION SAFETY PLAN

OVERVIEW

2.3.1. The Liverpool Bay CCS Project's Vessel Management Plan and Navigation Safety Plan provides a robust framework to ensure safe, environmentally responsible, and compliant vessel operations throughout the offshore construction, operation, and decommissioning phases. It integrates international maritime conventions, regulatory requirements,

environmental safeguards, stakeholder engagement, and emergency preparedness to manage complex vessel activities in a busy marine environment effectively.

VESSEL OPERATIONS AND SAFETY MEASURES

2.3.2. The plan mandates strict operational and safety protocols including continuous bridge watchkeeping, dynamic positioning certification, passage planning per SOLAS requirements, and adherence to ballast water management and garbage management plans. Vessels are required to maintain AIS, VHF communication channels, and comply with environmental protection measures such as spill prevention, waste segregation, noise reduction, and fuel management. Exclusion zones around cable-laying and pipeline corridors are enforced, with guard vessels deployed to monitor and prevent unauthorized vessel entry. Emergency response capacity is integrated through the Oil Pollution Emergency Plan (OPEP) and coordination with HMCoastguard and other emergency services.

COMMUNICATION AND COORDINATION

2.3.3. A centralised Marine Coordinator (MC) manages vessel movements, communications, and incident escalation. Communication protocols include use of Marine VHF Radio channels, real-time AIS tracking, and formal reporting to regulators and stakeholders. Notices to Mariners, Kingfisher Bulletins, and Local Notices to Mariners (LNtMs) are issued to inform marine users of construction activities, safety zones, and navigation hazards. The MC liaises with port authorities such as Peel Ports and the Port of Mostyn to coordinate vessel traffic and minimize disruption to commercial and fishing activities. Fisheries Liaison Officers (FLOs) facilitate engagement with the fishing community to manage gear interaction and minimize conflicts.

ENVIRONMENTAL AND FISHERIES LIAISON

2.3.4. Environmental management includes adherence to the Offshore Environmental Statement (ES), implementation of mitigation measures to reduce collision risk, noise emissions, and pollution. Fishing gear interaction protocols are established to facilitate fair resolution of claims and maintain positive relations with fisheries stakeholders. Waste management follows MARPOL requirements, with no discharge of plastics or prohibited substances at sea. Ballast water exchange is conducted in approved offshore zones using treatment systems where fitted. Noise reduction and spill response training are mandatory for vessel crews.

EMERGENCY PREPAREDNESS AND INCIDENT MANAGEMENT

2.3.5. The VMP & NSP includes provisions for emergency response, with vessels equipped with spill kits, oil booms, skimmers, and life-saving appliances. The MC acts as the first response coordinator for vessel-related emergencies such as collisions, fires, man overboard, or oil spills. Incident reporting and escalation pathways are clearly defined, involving the Developer, HM Coastguard, and regulators. Joint training exercises and drills are conducted to test communication and coordination during major campaigns.

VESSEL ASSURANCE, AUDITS, AND REVIEWS

2.3.6. Pre-mobilization assurance inspections, certification checks, and post-campaign audits ensure vessels comply with regulatory obligations. A Vessel Assurance Matrix and

checklist are maintained for detailed verification of certificates such as Load Line, Safety Construction, and DP system certification. Documentation control ensures all parties have the latest approved versions of the VMP & NSP. The plan is formally reviewed at least annually or upon significant changes to operations or regulations.

CONSTRUCTION AND OPERATIONAL PROGRAMMES

2.3.7. The document presents detailed timelines for key activities including survey and seabed preparation, cable laying, cable burial, pipeline spool laying, platform installation, and mattress placement. Activities are scheduled from 2026 through 2027 with specific vessel movements, transit dates, and operational windows. Coordination with ports such as Mostyn, Liverpool, and Rotterdam supports mobilisation and demobilisation logistics.

EXCLUSION AND ADVISORY ZONES

2.3.8. When carrying out the offshore construction activities, Liverpool Bay CCS Limited, and its contractors, will establish a series of exclusion and advisory zones to ensure the safety of personnel, protection of equipment, and the integrity of existing seabed infrastructure. These zones also support the orderly coordination of multiple vessels working in proximity. The nature, size, and enforcement of these zones may vary depending on the activity, but their purpose remains the same; to provide a controlled and predictable operating environment that reduces the risk of collision, entanglement, or interference.

2.3.9. The exclusion and advisory zones that will be adopted during the works are summarised in Table 2-1. Full details of the exclusion and advisory zones that will be implemented are presented in Section 6: Safety and Mitigation Measures of the combined 'CONDITION 3.27: VESSEL MANAGEMENT PLAN & CONDITION 3.29: NAVIGATION AND SAFETY PLAN'.

Table 2-1 – Exclusion and advisory zones

Zone Type	Radius/Area	Status	Notes
Construction exclusion zone	• 500 m around platforms]	• Mandatory	• Enforced by guard vessels
Diver exclusion zone	• 500 m around activity]	• Mandatory	• Enforced by guard vessels
Cable corridor	• 500 m width]	• Advisory	• Active during laying
Pipeline corridor	• 500 m width	• Advisory	• Active during laying
Anchor spread areas	• As required	• Temporary	• Defined in NtMs

2.4. LIGHTING AND MARKING

2.4.1. All temporary and permanent structures will be marked and lit in accordance with the approved Lighting and Marking Plan (LMP) submitted under CML2365 Condition 3.30.

2.4.2. In summary, during construction, or when a hazard exists, the following temporary marking is required:

- Mark the works/route and any hazards with IALA buoys as agreed with the GLA:
  - Special Marks (yellow) to indicate the works area/route or seabed features related to cables/pipelines. Lights (if fitted) show a yellow flashing rhythm agreed with the GLA.
  - Cardinal or Isolated Danger Marks if there is a discrete obstruction, exposure, crossing, or free span that presents a hazard to navigation.

- **Issue Notices to Mariners (local/UKHO)** in advance and update them as the work front moves; UKHO will then reflect changes in weekly Admiralty NtMs.
- **Use KIS-ORCA / Kingfisher bulletins** to notify fishing interests of vessel routes, timings, safety zones and locations.
- **Vessel lighting/shapes:** mattress laying, grapnel run, and boulder relocation vessels must exhibit lights/shapes for "restricted in ability to manoeuvre" and any underwater operations per COLREGS (enforced by MCA). (See MCA navigation safety MGNs and COLREGS obligations).

2.4.3. On completion of the construction activities, after burial and commissioning, **Notification within 10 days** will be given to the **Licensing Authority (NRW) and UKHO** so charting can be updated.

2.5. CONSENTS AND PERMITS

2.5.1. **Table 2.2** identifies the licenses, consents, and permits applicable for the activities covered by this **CEMP#2**. Copies of these will be retained on site.

Table 2.2 Consents and permits relevant to CEMP#2

Licence / consent / permit	Authority	Reference number	Relevant section (for conditions)	Responsibility
Marine Licence	• Natural Resources Wales (NRW)	CML2365	Notifications as per 3.1. and 3.2	LBCCS
Written notification of the date of commencement of any works on the site	• NRW	CML2365	Notifications as per 3.1.	LBCCS
Written notification of the date of the material start of each phase of development	• NRW	CML2365	Notifications as per 3.1	LBCCS
Notification of Vessel and/or Vehicles Notification of Agents/ Contractors/ subcontractors	• NRW, and Welsh Government Marine & Fisheries Division (Control & Enforcement Branch)	CML2365	Notifications as per 3.2. and 3.3	LBCCS
CEMP approval	• NRW	CML2365	Condition 3.25	LBCCS
Notices to Mariners, and Kingfisher Bulletins, and Local Navigational Warnings	• VARIOUS	CML2365	Condition 3.25	LBCCS

2.6. DESCRIPTION OF ACTIVITIES

BOULDER RELOCATION

2.6.1. Boulder relocation using a multi-purpose support vessel (MPSV) will be carried out as a seabed preparation activity ahead of electrical cable installation to ensure and clear and stable cable route.

2.6.2. Prior to pre-lay mattress installation, an MPSV like the Glomar Worker, as shown in Figure 2-2, or the Voe Vanguard, as shown in Figure 2-5, will be mobilised to clear the planned cable corridor of seabed obstructions. Typically operating on dynamic positioning, the vessel will be mobilised with boulder moving equipment and positioning systems. It will not be necessary to deploy anchors when carrying out the boulder relocation.

2.6.3. Using onboard survey systems, the vessel will verify the position and size of boulders identified during the replay surveys. A UTROV (Utility ROV) with boulder grab will be deployed to visually confirm each target and guide operations.

2.6.4. Depending in the boulder size, the MPSV's crane and UTROV is used to carefully move boulders away from the cable route. Throughout the operation, precise vessel positioning and real time monitoring ensure controlled handling and minimal disturbance. Once the corridor is cleared and verified, the re-lay mattresses can be installed ready for the later cable installation.

2.6.5. The proposed programme for the pre-lay boulder relocation seabed preparation works along the cable routes for the Point of Ayr (PoA) to Douglas CCS, and Douglas CCS to satellites cables, planned for 2026, is presented in Figure 2-2.

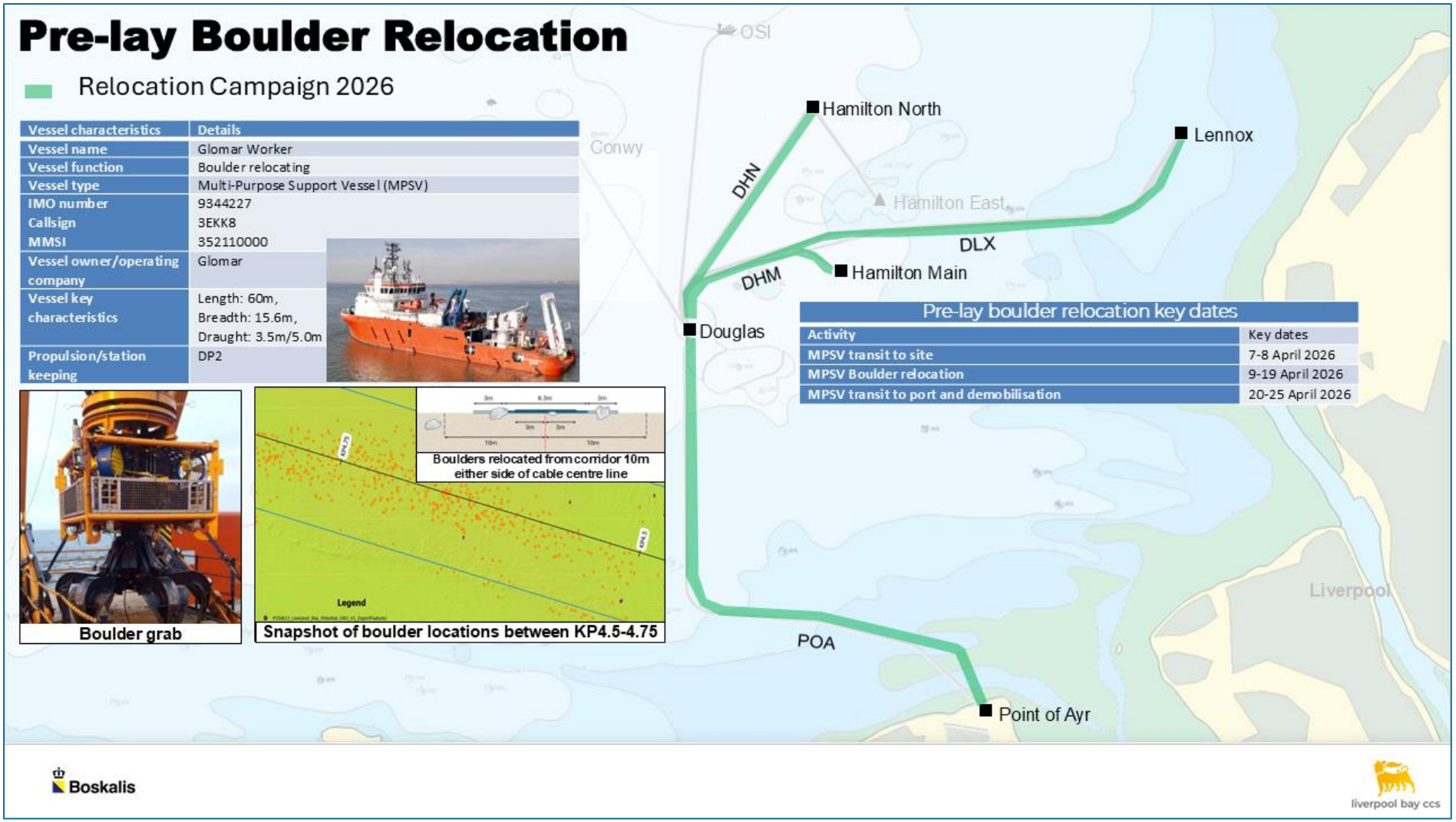


Figure 2-2: Location, method, and programme for pre-lay boulder relocation

PRE-LAY GRAPNEL RUN

2.6.6. A pre-lay grapnel run (PLGR) (Figure 2-3) will be performed to clear debris and abandoned items from the proposed cable route to reduce the risk of damage to the cable during installation. An MPSV, the Voe Vanguard, as shown in Figure 2-5, typically operating on dynamic positioning, will be mobilised with grapnel equipment and positioning systems. It will not be necessary to deploy anchors when carrying out the pre-lay grapnel run.

2.6.7. The operation begins with the establishment of the defined cable corridor using acoustic positioning and navigation tools. The grapnel is then deployed to the seabed and towed along the route at a controlled speed and depth, ensuring effective contact with the seabed surface. The grapnel, as shown in Figure 2-4, is designed to snag items such as discarded wires, chains, fishing gear, or other debris that could obstruct or damage the cable.

2.6.8. When an obstruction is encountered, increased line tension indicates a successful hook-up. The grapnel is recovered to deck, where the debris is removed and logged. Multiple grapnel runs may be completed to ensure the route is sufficiently clear. Upon completion, survey data and operational records are reviewed to confirm the seabed is suitable and Safe for subsequent electrical cabled installation.

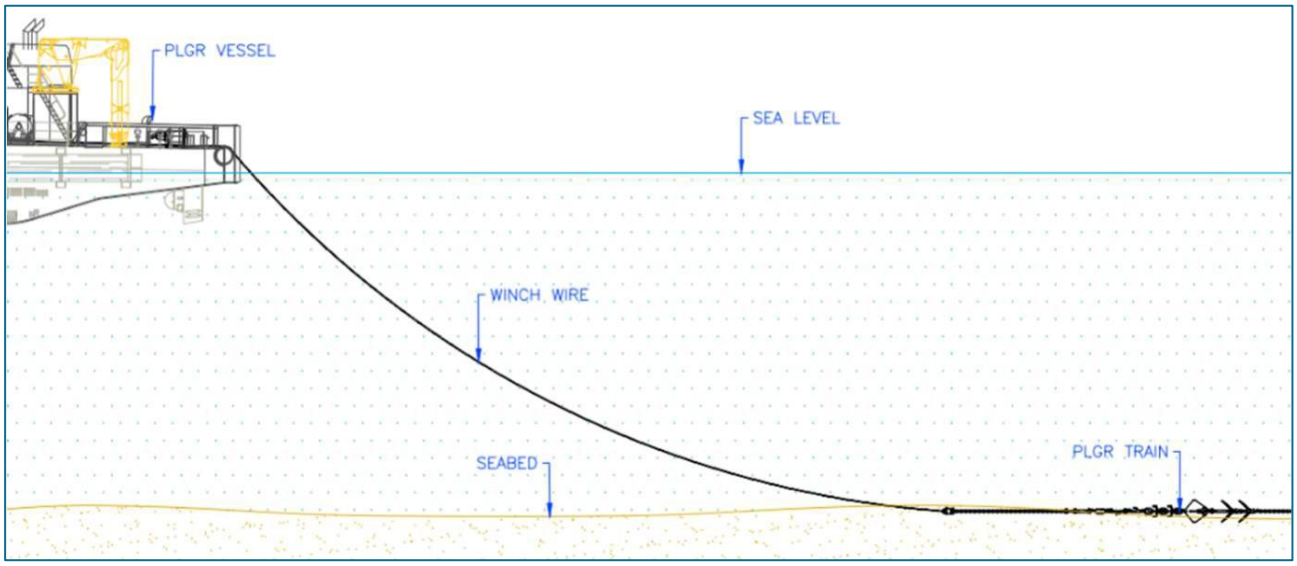


Figure 2-3: PLGR towing operation behind vessel

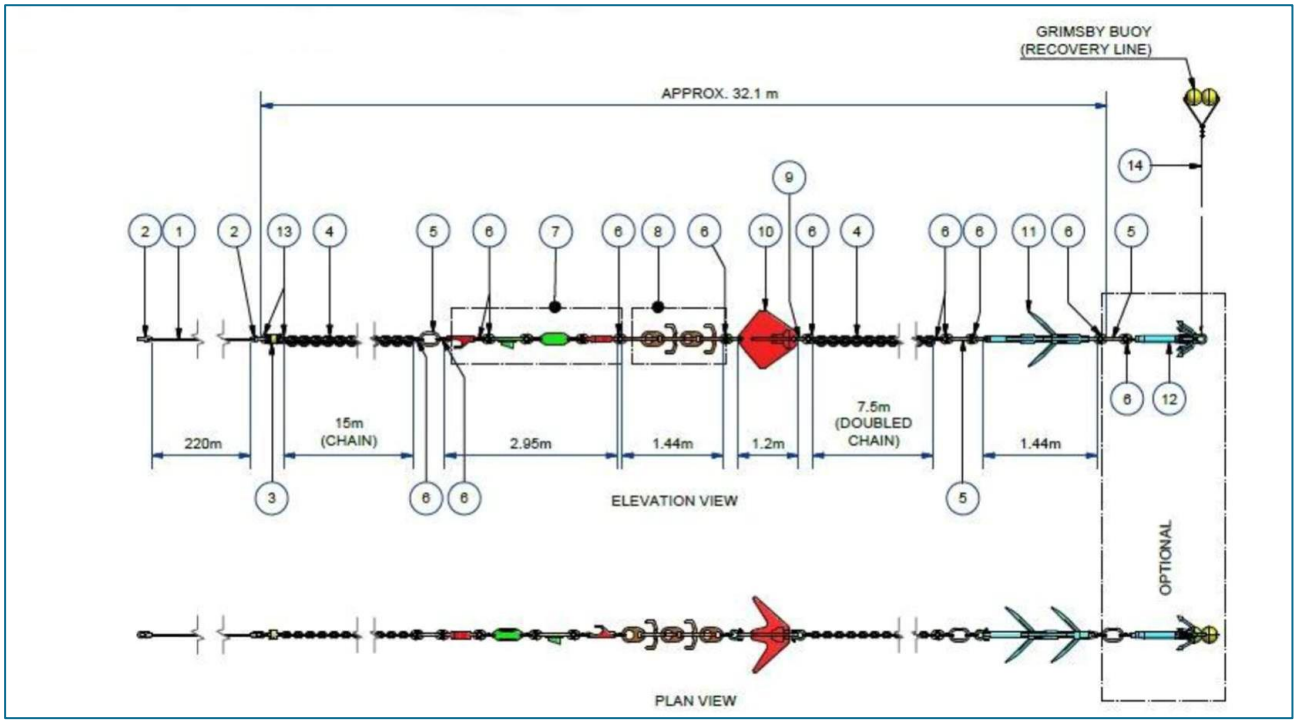


Figure 2-4: Typical PLGR grapnel train (Giffords assembly, Rennie grapnel, flat fish prong, sliding prong, spearpoint grapnel)

2.6.9. The proposed programme for the pre-lay grapnel run seabed preparation works along the cable route for the PoA to Douglas CCS cable, planned for April 2026, is presented in Figure 2-5.

PRE-TRENCHING PREPARATION FOR CABLE BURIAL

2.6.10. Following the removal of boulders, debris, fishing gear, and the establishment of any exclusion zones for unexploded objects (UXO), pre-trenching activities will be conducted to reduce the risk of cable burial refusal during simultaneous or post-lay burial. Coordinates for the pre-trenching are presented in Table 2.3.

2.6.11. To carry out this activity, the Ndeavour trenching support vessel, equipped with a cable trenching tool, will be employed to execute the pre-trenching. The pre-trenching will be performed by a tracked trencher with cutting and jetting capabilities. The trench, created by during the pre-trenching, will backfill through both the collapse of the trench, following departure of the trenching tool, and natural seabed movement.

2.6.12. The proposed programme for the pre-trenching run along the cable route for the PoA to Douglas CCS cable, planned for April 2026, is presented in Figure 2-6.

Table 2.3 Coordinates of pre-trenching for PoA to Douglas CCS cable

KP	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)	KP	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)
11.3	03 47 12.47	53 39 54.95	34	03 58 29.34	53 53 87.49
6	3.39409199	53 38 37.12	9	03 43 77.15	53 39 05.70
1	3.33905182	53 35 95.23	2.5	03 34 70.22	53 37 21.36

Figure 2-5: Location, method, and programme for pre-lay grapnel run

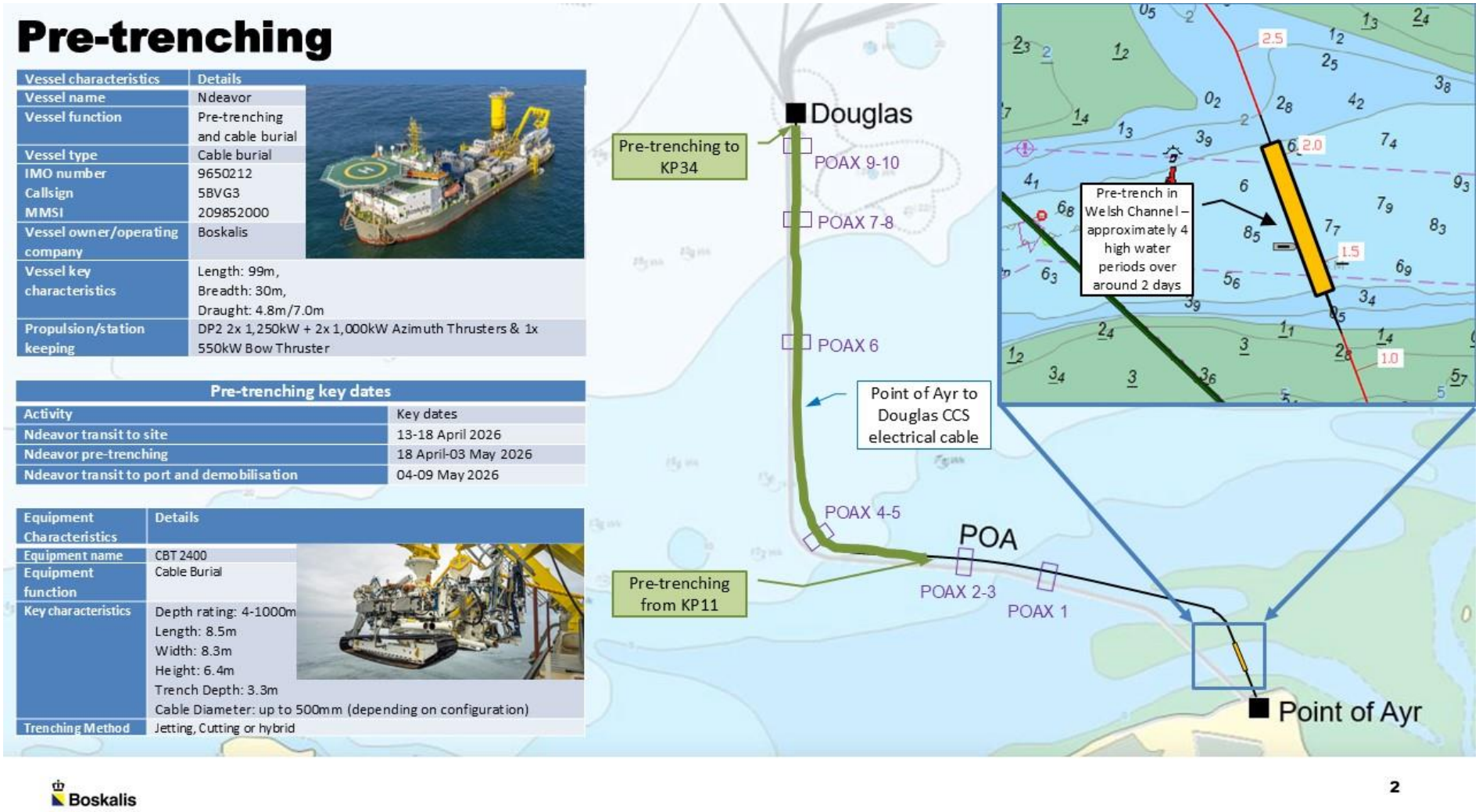


Figure 2-6: Location, method, and programme for pre-trenching

CROSSING AND PROTECTION INSTALLATION

2.6.13. Pre-lay mattresses will be installed at 29 crossing locations in Welsh Waters, and four in English Waters. Appendix A presents a chart of the crossing locations and their relationship to other infrastructure. Extracts from this chart are presented in Figure 2-8, Figure 2-9, and Figure 2-10. The pre-lay mattresses at each crossing will be a standard design, 6m in length, 3m in width, and 0.3m in height, each weighing approximately 9,400kg. Figure 2-7 shows a plan and elevation of the bi-tapered mattress standard design.

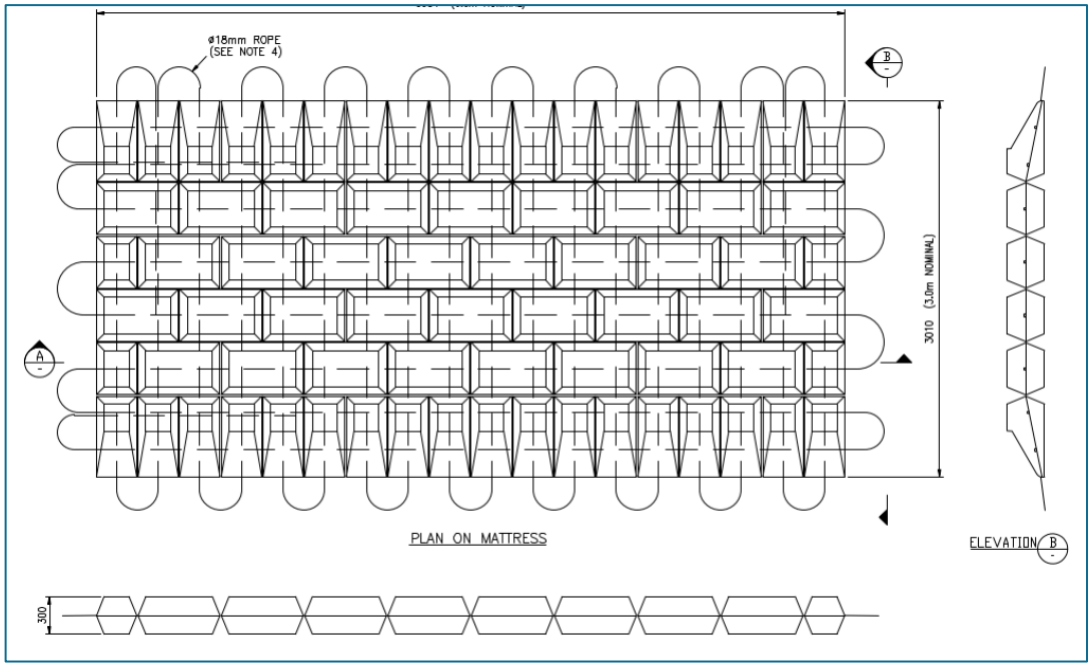


Figure 2-7: Plan view, and elevation of bi-taper mattress

2.6.14. An MPSV like the Glomar Worker, as shown in Figure 2-8, or the Voe Vanguard, as shown in Figure 2-5, equipped with dynamic positioning, and a crane, will be mobilised for the operation. It will not be necessary to deploy anchors when carrying out the pre-lay mattress installation.

2.6.15. Following pre-installation surveys to confirm seabed conditions and exact placement locations, concrete mattresses will be lifted from deck using the vessel crane. The mattresses are carefully lowered to the seabed using specialised Mattress Installation Frames (MIF). These frames ensure stability and control during lowering operations, minimising the risk of damage to the mattress, or the subsea cable, and limiting disturbance to the seabed.

2.6.16. Positioning is monitored using Echoscope (real-time 3D sonar) that can offer a 3D visualisation during the pre-lay mattress installation process, and it helps ensure mattresses are placed accurately even in low-visibility conditions without the need of the UTROV cameras.

2.6.17. Once on the seabed, the mattresses will be adjusted as required using the ROV to achieve full contact and stability. Installation is completed in accordance with the predefined layout and tolerances. A post-installation inspection will then be carried out to verify the correct placement and readiness of the route for the subsequent cable installation.

2.6.18. Coordinates and descriptions for the crossings along the PoA to Douglas CCS cable are presented in Table 2.4.

Table 2.4 Coordinates of crossings for PoA to Douglas CCS platform cable

Crossing ID	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)	Number of pre-lay mattresses	Description of crossing
PoAX-1	03 26 16.63	53 23 25.2	2	Ørsted Burbo Bank wind farm
PoAX-2 & 3	03 28 14.81	53 23 41.99	4	Greencoat UK Wind North Hoyle wind farm
PoAX-4 & 5	03 34 28.38	53 24 20.1	2	Gwynt y Môr OFTO, Gwynt y Môr wind farm
PoAX-6	03 34 41.76	53 28 4.58	1	Gwynt y Môr OFTO, Gwynt y Môr wind farm
PoAX-7	03 34 44.44	53 31 21.46	None	National Grid/Scottish Power, Western Link HVDC cable
PoAX-8	03 34 44.46	53 31 22.48	None	National Grid/Scottish Power, Western Link HVDC cable
PoAX-9	03 34 42.59	53 32 1.96	1	2 x 3" Condensate (PL1032 and PL1033) to PoA
PoAX-10	03 29 17.26	53 32 3.56	1	20" Gas (PL1030) to PoA

2.6.19. Coordinates and descriptions for these crossings along the Douglas CCS to Hamilton North cable are presented in Table 2.5. Cable crossing locations and numbers are shown in Figure 2-10.

Table 2.5 Coordinates of crossings for Douglas CCS platform to Hamilton North cable

Crossing ID	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)	Number of pre-lay mattresses	Description of crossing
DHNX-1	03 35 29.52	53 33 3.27	2	8" Production (PL2939) to CONWY
DHNX-2	03 35 29.52	53 33 3.27	2	3" Condensate PL (PL2941) to CONWY
DHNX-3	03 35 28.93	53 33 4.52	2	8" Water Injection Pipeline (PL2940) to CONWY
DHNX-4	03 34 58.92	53 33 41.09	1	14" Oil Export (PL1031) to OSI
DHNX-5	03 34 27.15	53 33 47.24	2	14" Gas Export (PL1041 + 2" Methanol (PL1042) from Hamilton North
DHNX-6	03 34 24.76	53 33 47.7	2	Existing power cable to Hamilton North

Note: The crossings highlighted in grey are in English Waters. They are included here for completeness and cumulative impact reasons, as they will be installed close to the Wales/England border in the same campaign as those in Welsh Waters.

2.6.20. Coordinates and descriptions for these crossings along the Douglas CCS to Hamilton Main cable are presented in Table 2.6. Cable crossing locations and numbers are shown in Figure 2-9.

Table 2.6 Coordinates of crossings for Douglas CCS platform to Hamilton Main cable

Crossing ID	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)	Number of pre-lay mattresses	Description of crossing
DHMX-1	03 34 48.66	03 32 27.88	3	8" Production (PL2939) + 3" Condensate (PL2941) to CONWY
DHMX-2	03 34 46.80	03 32 28.30	3	8" Water Injection (PL2940) to CONWY
DHMX-3	03 34 45.71	03 32 28.55	3	14" Oil Export (PL1031) to OSI
DHMX-4	03 34 44.28	03 32 28.88	3	14" Gas (PL1041) + 2" Methanol (PL1042) from Hamilton North
DHMX-5	03 34 43.32	03 32 29.10	3	Existing power cable to Hamilton North
DHMX-6	03 34 42.75	03 32 29.23	3	Existing power cable to Hamilton Main
DHMX-7	03 34 41.66	03 32 29.47	3	16" Gas Injection (PL1035) from Lennox
DHMX-8	03 34 40.31	03 32 29.78	3	14" Oil Export (PL1034) + 2" Methanol (PL1037) from Lennox
DHMX-9	03 34 39.02	03 32 30.07	3	12" Gas Injection (PL1036) + 2" Wax Inhibitor (PL1038) to Lennox
DHMX-10	03 34 37.84	03 32 30.35	3	20" Gas Export (PL1039) + 2" Methanol (PL1040) from Hamilton Main
DHMX-11	03 34 35.74	03 32 30.82	3	12" Gas Injection (PL1036A) to Lennox

2.6.21. Coordinates and descriptions for these crossings along the Douglas CCS to Lennox cable are presented in Table 2.7. Cable crossing locations and numbers are shown in Figure 2-10.

Table 2.7 Coordinates of crossings for Douglas CCS platform to Lennox cable

Crossing ID	Easting WGS84 (DDMMSS)	Northing WGS84 (DDMMSS)	Number of pre-lay mattresses	Description of crossing
DLX-1	03 21 12.72	05 21 58.82	2	8" Production (PL2939) to CONWY
DLX-2	03 35 28.33	53 33 2.19	2	3" Condensate PL (PL2941) to CONWY
DLX-3	03 35 27.76	53 33 3.41	2	8" Water Injection Pipeline (PL2940) to CONWY
DLX-4	03 34 59.06	53 33 40.05	1	14" Oil Export (PL1031) to OSI
DLX-5	03 34 28.69	53 33 45.92	2	14" Gas Export (PL1041 + 2" Methanol (PL1042) from Hamilton North
DLX-6	03 34 26.27	53 33 46.39	2	Existing power cable to Hamilton North

Note: The crossings highlighted in grey are in English Waters. They are included here for completeness and cumulative impact reasons, as they will be installed close to the Wales/England border in the same campaign as those in Welsh Waters.

2.6.22. The proposed programme for the installation of pre-lay mattresses along the cable routes for the PoA to Douglas CCS, and Douglas CCS to satellites cables, planned for 2026, is presented in Figure 2-8.

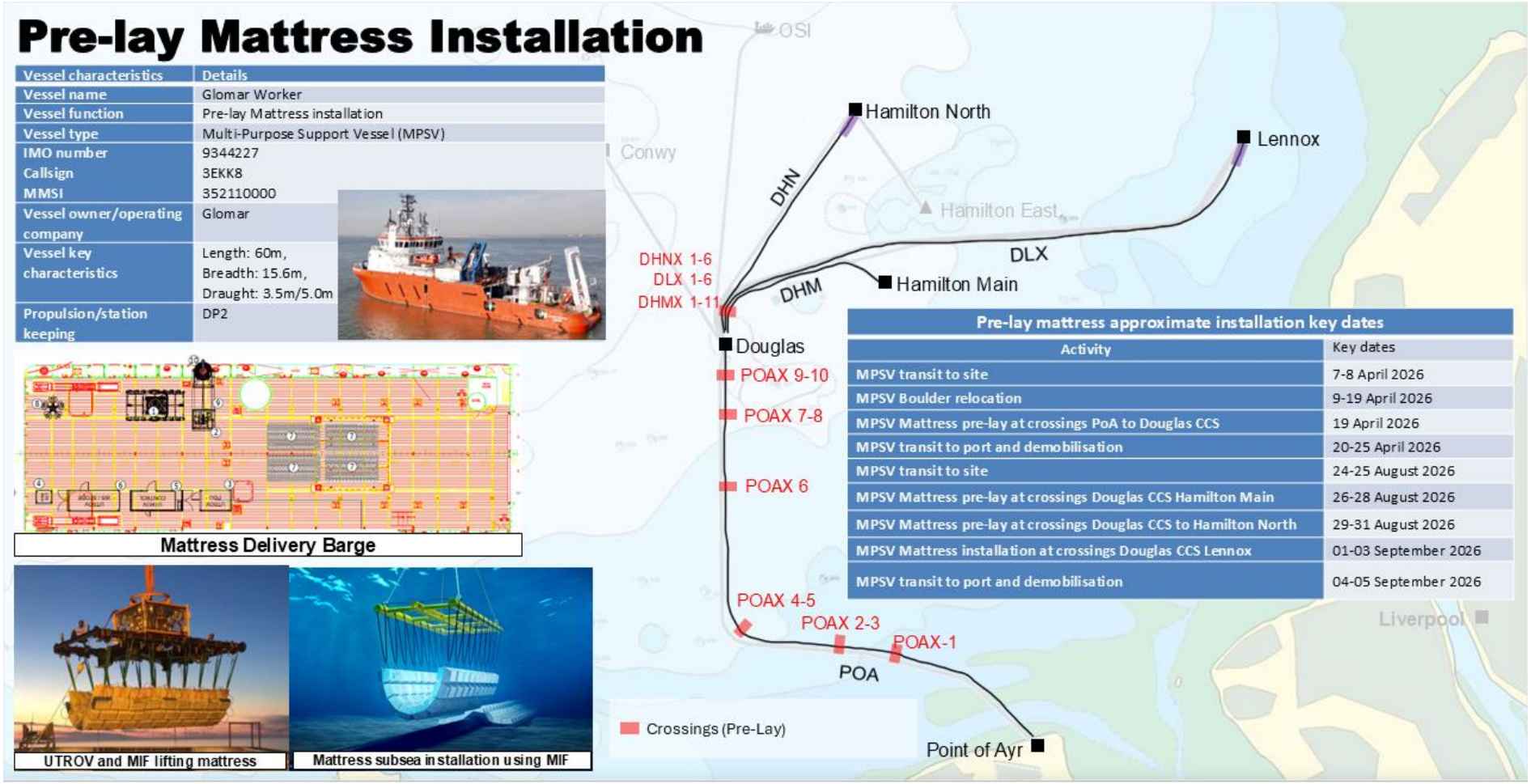


Figure 2-8: Location, method, and programme for pre-lay mattress installation

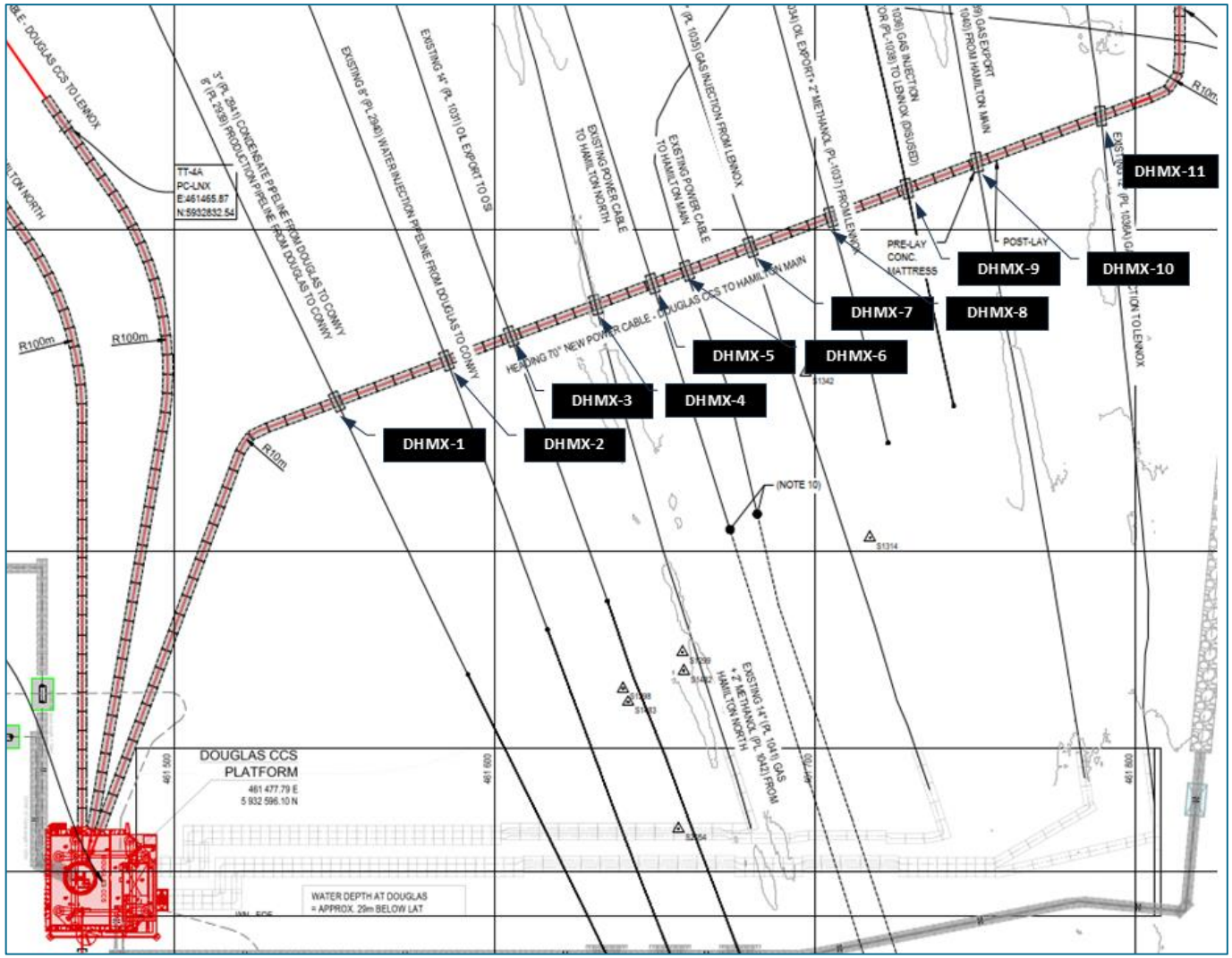


Figure 2-9: Locations for pre-lay mattress installation along Douglas CCS to Hamilton Main Cable

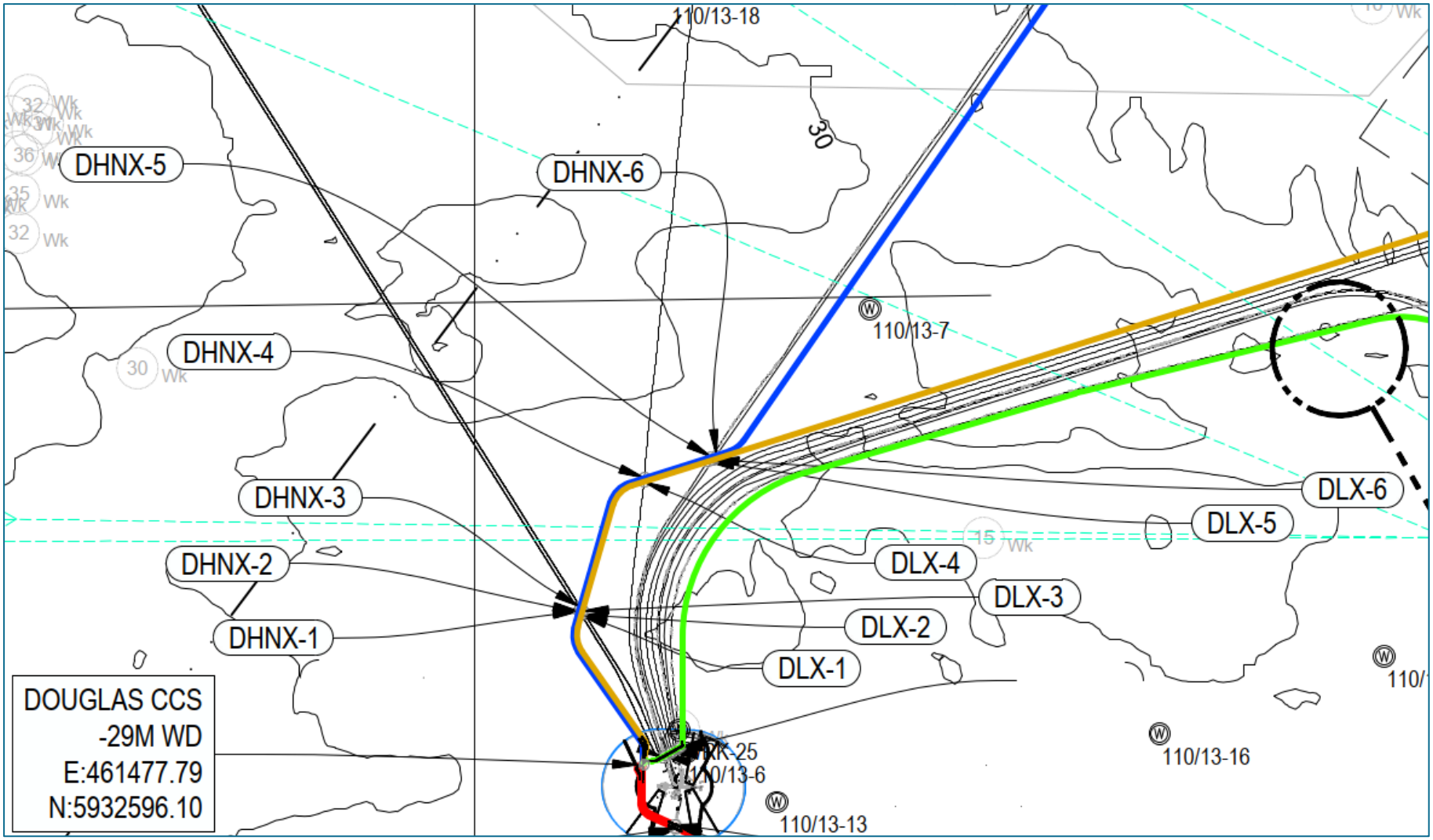


Figure 2-10: Locations for pre-lay mattress installation along Douglas CCS to Hamilton North (DHNX), and Lennox (DLX) Cables

3. PART 1: MANAGEMENT, IMPLEMENTATION, AND COMMUNICATION

3.1. ROLES AND RESPONSIBILITIES

3.1.1. This section defines accountability and operational roles across the following key entities:

- Liverpool Bay CCS Limited (Developer / Marine Licence Holder); and
- Vessel Owner/Operator (Boskalis Subsea Cables).

3.1.2. Each role is structured by "Activity" and "Description," establishing a clear governance chain from legal accountability (Developer) down to real-time operations and stakeholder engagement.

LIVERPOOL BAY CCS LIMITED

3.1.3. Liverpool Bay CCS Limited holds ultimate responsibility for navigational safety associated with the project. They must ensure that all lighting and marking measures are approved, implemented, maintained, and verified in accordance with the Marine Licence, UK maritime law, and GLA/MCA guidance, and that any failure or change is promptly reported and rectified.

3.1.4. Table 3-1 presents a structured overview of the roles and responsibilities of Liverpool Bay CCS Limited in conducting the works.

Table 3-1 – Roles and responsibilities of Liverpool Bay CCS Limited as the Marine Licence holder

Activity	Description
Overall compliance governance	• Act as the **duty holder under the Marine Licence**, responsible for compliance with all licence conditions relating to navigational safety, lighting, marking and notification. • Retain **ultimate legal responsibility** for ensuring the **CEMP** meets all Marine Licence conditions and statutory requirements, regardless of delegation to contractors. • Hold ultimate responsibility for ensuring **all vessel activities comply with the Marine Licence** and other consents. • Ensure contractors, subcontractors, and vessel operators meet **legal, environmental, and safety obligations**. • Act as the single point of accountability to the **Regulator** for vessel-related compliance. • Ensure the **Lighting and Marking Plan (LMP)** is prepared, approved, implemented, and maintained in accordance with the conditions of the Marine Licence and relevant UK legislation (Energy Act 2008, Merchant Shipping Act 1995, and IALA standards). • Maintain **auditable evidence** that all measures remain compliant throughout the project lifecycle.
Development and approval of the management plans	• Set the **scope, structure, and minimum content of the CEMP**, ensuring alignment with the Marine Licence, Environmental Statement / EIA commitments, and regulatory guidance. • Ensure that the **CEMP reflects all relevant Marine Licence conditions**, deemed consent conditions, and other environmental permits. • Prepare and submit the **Lighting and Marking Plan** to **Natural Resources Wales (NRW)** and the **Maritime and Coastguard Agency (MCA)** for review, and obtain **formal approval from Trinity House (GLA)** for all Aids to Navigation (AtoN).

Activity	Description
	• Ensure the plan references relevant standards and guidance (IALA O-139, MCA MGNs 401, 543, 654, and DECC "Standard Marking Schedule"). • Update the plan as required following design or programme changes, and circulate revisions to all stakeholders.
Implementation and operation	• Ensure the **Principal Contractor and subcontractors implement the CEMP** measures in full during construction. • Ensure **sufficient resources**, competence, and authority are available to deliver the CEMP requirements. • Ensure the **CEMP is aligned** with the Vessel Management Plan (VMP), OPEP, Emergency Response Plan, and other project management documents. • Ensure all vessel operations are conducted in line with: – The **Construction Environmental Management Plan (CEMP).** – The **Oil Pollution Emergency Plan (OPEP).** – MARPOL requirements for waste, fuel, ballast, and emissions. • **Provide oversight** of environmental risk mitigation measures, including spill prevention and noise reduction. • Ensure **monitoring programmes** (e.g. noise, marine mammal observers, fisheries liaison) are in place where required by licence. • Ensure all **temporary and permanent AtoN** (lights, buoys, fog signals, identification panels, AIS AtoN etc.) are installed, commissioned, and operated in accordance with the approved plan and the GLA's requirements. • Confirm that each AtoN has appropriate **autonomy (≥ 96 hours), photocell / visibility control**, and **availability** per IALA Category 1 standards (≥ 99.8 % availability). • Maintain clear operational control of all AtoN through the appointed **Marine Coordinator (MC)** or AtoN maintenance contractor. • Arrange for regular inspection, maintenance and testing of all navigation lights and marks, and keep verifiable records.
Notifications and stakeholder communication	• Ensure effective stakeholder engagement is carried out, including: – **Fisheries Liaison Officer (FLO)** appointment and oversight. – Regular consultation with fisheries organisations, ports, and maritime authorities. – Transparent communication with stakeholders before, during, and after offshore operations. • Support fair and timely resolution of **fishing gear interaction** incidents. • Ensure timely issue of **Local and Admiralty Notices to Mariners (NtMs)** prior to, during, and following construction activities, as required under the Marine Licence. • Notify the **UK Hydrographic Office (UKHO)** within the specified period (usually **within 10 days of completion**) so that all new or removed structures are correctly charted. • Coordinate with the **Kingfisher Information Service (KIS-ORCA)** to inform fishing and maritime communities of vessel routes, safety zones and locations of works. • Maintain open communication with **NRW, MCA, Trinity House**, and **local harbour authorities.** • Ensure regulators are informed of vessel mobilisation/demobilisation and incidents in a timely manner.
Incident, defect, and outage management	• Require and oversee **corrective and preventive actions** where non-compliance with the CEMP is identified. • Ensure **material non-conformances or incidents are reported** to the Regulator in line with licence conditions. • Ensure all **vessel-related incidents** (safety, environmental, or navigational) are reported to the Regulator. • Oversee the **implementation of emergency response plans**, including **OPEP** and **SAR** coordination. • Ensure that any failure, defect or outage of AtoN or lighting/fog signal is: o **Reported immediately** to Trinity House, MCA and NRW;

Activity	Description
	○ **Rectified as soon as practicable** (normally within 24 hours); and ○ **Recorded in a maintenance and incident log** for audit purposes. • Investigate any navigation incident, near miss, or complaint arising from the project, and implement corrective actions.
Removal and demobilisation	• Remove all **temporary AtoN** promptly when no longer required and only after **written authorisation from Trinity House**. • Provide confirmation to NRW and UKHO that all marks and lights have been removed or replaced by permanent AtoN as appropriate. • Ensure seabed and navigational hazards are cleared and verified safe post-construction.
Oversight and audit	• Conduct internal **compliance audits** of the CEMP implementation during construction and prior to handover to operations. • Ensure vessels comply with: – **Marine Licence conditions** (e.g. notifications, safety zones, pollution prevention). – **IMO conventions** (MARPOL, SOLAS, COLREGs, STCW). – **National requirements** (e.g. MCA guidance, fisheries regulations). • Submit reports, notifications, and evidence of compliance to the Regulator as required. • Make all inspection, maintenance and reporting records available to **NRW**, **MCA**, and **Trinity House** on request. • Review and update the CEMP as necessary • Drive continuous improvement by capturing and applying **lessons learned** across project phases..

BOSKALIS SUBSEA CABLES

3.1.5. Vessel owners and operators are responsible for the execution of project requirements. Their duties include operating vessels safely, maintaining statutory and regulatory compliance, ensuring proper crewing and maintenance, and meeting both international law and project-specific standards. Table 3-2 presents a structured overview of the roles and responsibilities of Boskalis Subsea Cables in conducting the works.

3.1.6. They must ensure their vessels comply with lighting, marking, and operational requirements specified in the Lighting and Marking Plan, COLREGS, and the Marine Licence. This includes deploying, monitoring, and reporting all temporary AtoN as required.

3.1.7. Boskalis Subsea Cables will contribute to the project's navigational safety assurance framework under the direction of Liverpool Bay CCS Limited.

3.1.8. These tasks are defined by UK maritime law and Marine Licence conditions, with the purpose of maintaining navigational safety, personnel welfare, and marine environmental protection.

Table 3-2 – Roles and responsibilities of Boskalis Subsea Cables

Positions	Responsibilities
Director Operations	• Delegated Corporate responsibility for Environment • Ensure Environmental Management is followed according to Liverpool Bay CCS Limited's policy, relevant legislation and Liverpool Bay CCS Limited requirements
Manager HSE-Q	• Advises Director Operations on all aspects of the Environment

Positions	Responsibilities
	• Develop a management system to comply with environmental legislation, consents, objectives, targets and other environmental commitments • Assigns a Project SHE-Q Manager to the project in consultation with the relevant Project Manager
Project Manager	• Assigns an offshore SHE-Q Advisor as required, in consultation with the relevant Project Manager Project Manager • Ultimate responsibility for Environmental aspects on the project • Responsibility of Environmental aspects on operational affairs • Investigates any environmental observations and takes corrective action as required • Ensures that Project personnel comply with the requirements imposed by the Project Management System, Contract and Legal requirements. • Carries out risk assessments (HAZID / RAMS Study) during engineering phase. • Ensures that project personnel are made fully aware of their respective environmental responsibilities.
Works Manager	• Ensures that all operations are carried out in accordance with safe working practices • Ensures that the Project Manager is made aware of any environmental matters and copy all relevant reports to the Project SHE-Q Manager
Site Manager	• Arranges transport of personnel between the airport and vessel, including local accommodation, checking personnel certification, performing project induction and registration • Carry out environmental inductions to (new) project personnel, subcontractors and other actors involved.
Vessel Master	• Liaises with the Offshore Construction Manager to ensure that all Project-related environmental matters are dealt with effectively • issues written statement of facts on any incident to Project Manager
Offshore Construction Manager, Supervisors, Foremen,	• Direct responsibility for SHE-Q supervision at the actual work site and of their team • Responsible for the operational management of vendors under their control • Completes the formal procedures prior to commencement of any work activity Job Safety Analysis (JSA), Permit to Work (PTW), Toolbox Talk (TBT), Management of Change (MoC) as necessary) • Issues written statement of facts on any incident to Project Manager / SHE-Q Advisor
(Lead) Project Engineers	• Devise and prepares methodologies/procedures for installation operations • Makes sure that the safest and most efficient solutions are implemented within the project • Prepares and executes interface management • Co-ordinates production of storyboards and other visual aids • Liaises with technical support services where required between parent organizations and Boskalis Subsea Cables • Prepares task plans to ensure key elements within procedures are complied with • Provides support for the provision of verification points based on procedural Task Plans (Lead) Project Engineers • Define the technical requirements for provision of vendor services (Design/Manufacture/Supply) • Conducts evaluation (technical) of received proposals from vendors • Participates in project meetings with Liverpool Bay CCS Limited

Positions	Responsibilities

Project SHE-Q Manager	• Prepares project SHE-Q Management Plans
	• Regularly reviews (and updates as necessary) the SHE-Q Management Plans
	• Monitors implementation of the SHE-Q Management Plans for the project
	• Completes any incident investigations and reports to Project Manager
	• Additional responsibilities, which may be delegated:
	  • Undertaking random spot-checks on the project site and vessels to verify compliance with the Project Environmental Plan
	• Monitor:
	  • SHE-Q performance complies with all Boskalis Subsea Cables', Liverpool Bay CCS Limited's and Legal requirements

Offshore SHE-Q Advisor (Medic where required by contract or risk assessment)	• Act as the on board SHE-Q representative for Boskalis Subsea Cables • Advises Supervisors and crew on all aspects of Environmental • Monitors implementation of the Project Environmental Plan on the vessel
All project personnel (each person on the project, including Liverpool Bay CCS Limited, vendors and visitors)	• All Project personnel are responsible for their own impact on Environment, and that of their colleagues • No person shall be expected to work in a situation they consider unsafe (for people and / or environment). • Each person is responsible to STOP a job when they consider it deviates from requirements. • Complies with the SHE-Q Policy and with the specific project SHE-Q Instructions • Uses and maintains the supplied Personal Protective Equipment (PPE) and other rescue equipment in an appropriate manner • Maintains the relevant environmental measures
Subcontractor (where applicable)	• Ensures that all their project personnel have been given site induction training and adhere to the given environmental instructions • Reports any deviation during the execution of the subcontracted works to the Boskalis Subsea Cables Project Manager • Ensures that own personnel are compliant with the BSC trainings matrix

Table 3-3 – Activities required of Boskalis Subsea Cables

Activity	Description
Compliance with statutory requirements	• Ensure compliance with the **Merchant Shipping (Safety of Navigation) Regulations 2002, COLREGS 1972**, and relevant **MCA Marine Guidance Notes (MGNs)**, including **MGNs 543, 654, and 372**. • Operate in accordance with this approved **Lighting and Marking Plan** and any site-specific requirements agreed with the **General Lighthouse Authority (GLA)** and **MCA Navigation Safety Branch**. • Maintain an auditable record of all navigational aids, warning signals, and lights fitted and operated on board.

Lighting and marking of vessels during construction	• During the construction and installation phases (including platform installation, cable lay, pipeline lay, mattress and rock placement), all project vessels must:
	Display Required COLREGS Lights and Shapes
	  o Display the correct lights, day shapes, and signals for "**Vessels Restricted in Their Ability to Manoeuvre**" (Rule 27), **towing, underwater operations, or anchored status**, as applicable.
	  o Ensure **obstruction-side and safe-side lights** (red/red and green/green) are correctly exhibited where required.
	  o Operate **deck and work lights** so that they do not obscure or reduce visibility of prescribed navigational lights.
	Support Temporary Aids to Navigation (AtoN)

Activity	Description
	○ Assist in the **deployment, monitoring, and maintenance** of temporary buoys, beacons, or lighted marks established under the LMP. ○ Notify the **Marine Coordinator and Trinity House** of any AtoN malfunction, damage, or displacement immediately. ○ Record all checks, outages, and rectifications in vessel logs and communicate these through the project reporting chain. **Ensure Safe Operations and Marking During High-Risk Activities** ○ Maintain an **active AIS signal**, VHF watch, and appropriate radar reflector visibility. ○ Display **additional lighting** or warning beacons as specified in the LMP when operating at night or in reduced visibility, provided these do not conflict with COLREGS lights. ○ Use **guard vessels** where required to maintain exclusion or advisory zones and to warn third-party traffic.
Communication and notification responsibilities	• Communicate daily with the **Marine Coordinator** to confirm vessel positions, lighting status, and operational plans. • Notify the Marine Coordinator immediately of any: ○ Failure of navigational lights, fog signals, or AtoN equipment; ○ Navigational hazard, debris, or dropped object; ○ Any change to vessel configuration that affects marking or safety zones. • Cooperate with the issue of **Notices to Mariners (NtMs)** and the **Kingfisher Information Service (KIS-ORCA)** by supplying accurate operational and positional information.
Maintenance and inspection	• Conduct daily inspection and functional checks of all vessel navigation lights, shapes, and fog signals. • Maintain **spare bulbs, lenses, fuses, and backup power supplies** to ensure redundancy and ≥96-hour autonomy where required. • Support periodic audits of lighting and marking arrangements undertaken by the **Marine Coordinator, NRW Compliance Officer**, or **GLA**.
Reporting and record keeping	• Maintain vessel **navigation logbooks** detailing daily lighting and marking status, including checks and outages. • Record all **dropped objects** or debris recoveries in coordination with the **Dropped Object Plan** and report to the Marine Coordinator. • Provide reports on AtoN or light failures to the Developer/Licence Holder and relevant authorities within **24 hours** of detection.
Demobilisation	• Remove or deactivate all temporary lights, marks, and signals upon completion of construction activities and only **after authorisation by the Marine Coordinator and Trinity House**. • Confirm in writing that no residual hazards remain and that the seabed and navigational area are left clear of unmarked obstructions (see **Dropped Objects Plan**).

3.2. COMPETENCE, TRAINING, AND AWARENESS

3.2.1. Boskalis Subsea Cables shall ensure that appropriate awareness training is delivered to all site operatives and only appropriately qualified Subcontractors are appointed.

3.2.2. Every member of the workforce shall be required to participate in a site induction prior to starting work on the site. The level of induction training will depend upon the position and duties the person is to perform. The site induction will include:

- A brief overview of the works to be undertaken and any potential environmental aspects associated with construction.
- A summary of the sensitive environmental receptors near the site.
- An overview of the applicable environmental mitigation and pollution control measures.

- An overview of the health and safety management measures in particular emergency response procedures required at the site.

3.2.3. Liverpool Bay CCS Limited will require Boskalis Subsea Cables to provide continuing training and awareness raising of the workforce. This can be delivered in the form of Toolbox Talks tailored to the specific environmental mitigation measures required dependent on the work activities being undertaken and to raise awareness on environmental best practice.

3.2.4. Records of all inductions and Toolbox Talk deliveries shall be maintained at the site office. Copies shall be made available to Liverpool Bay CCS Limited on request.

3.2.5. The Boskalis Subsea Cables Human Resources Management (HRM) and Crewing Department determines the necessary competency for personnel performing work affecting product quality in consultation with the Project Manager and the Project SHE-Q Advisor and considering specific project requirements. The competency requirements are included in the Training Matrix, which is part of BSC Way of Working in the integrated management system (WoW). Trainings will be planned via the HRM Department and records of the trainings are kept at the office and are available at project level.

3.2.6. Personnel will be made aware of the relevance and importance of their activities and how they contribute to the achievement of the project objectives. The appropriate records of training, education, skill and experienced will be maintained in the head office.

3.2.7. Employees who are engaged in special work will attend special training. Training records will be registered, and the training records will be available on site.

3.3. COMMUNICATIONS AND REPORTING

3.4. INTERNAL COMMUNICATION

3.4.1. Boskalis Subsea Cables' CM, Field EM or equivalent person and other relevant team members shall meet weekly to review the status of environmental aspects including but not limited to:

- Works activities underway and planned.
- Mitigation measures required to be implemented.
- Results of weekly inspections and any audit results/feedback.
- Any corrective and preventative actions required to be implemented.
- Identification of areas for continual improvement.
- Status of staff competence and training needs.
- Status of CEMP #2 and of any required consent and approvals and the need for review and updating.

3.4.2. Liverpool Bay CCS Limited shall be informed of the outcome/minutes of all such meetings.

3.4.3. Additional and ongoing communication of environmental performance and requirements is to be determined by the Boskalis Subsea Cables and provided as appropriate.

NOTICE BOARDS

3.4.4. Boskalis Subsea Cables provides and maintains project environmental notice board(s) which are positioned to ensure all operatives can review the notice board a daily basis. The notice boards should be updated at least monthly. As a minimum, the notice boards shall contain:

- Clients Environmental Policy.
- Emergency contacts list.
- Relevant statutory and non-statutory advice and guidance.
- Description of the key environmental risks and intended risk mitigation measures.

3.4.5. These environmental notice boards will be situated in prominent positions including the main reception area of the site office.

TOOLBOX TALKS

3.4.6. Toolbox Talks will be used to inform all site personnel of key information concerning the management of the site, procedures to be followed and expected standards / controls when working on the project. The Toolbox Talks will cover a broad range of topics including those related to best practice environmental management.

3.4.7. A record of Toolbox Talks will be kept on site, starting date, description of non-conformance, potential implications, proposed corrective actions, individual responsible and target data. Toolbox Talks shall include, but will not be limited to, instances where:

- There is a change to existing legislation, which requires an operation change.
- Site inspections or audits have identified corrective actions which require communicating.
- There are significant changes in environmental conditions i.e. heavy rainfall.

3.4.8. The frequency and topics of the Toolbox Talks shall depend upon the phase construction. They shall be provided as often as necessary to address site-specific environmental requirements.

3.5. EXTERNAL COMMUNICATIONS

OVERVIEW

3.5.1. Effective communication is central to ensuring safe, coordinated, and compliant construction activities in the UK offshore marine environment. Because operations often involve multiple vessels, complex marine spreads, divers, ROVs, subsea infrastructure, and potentially congested shipping or fishing areas, a robust communication protocol is required to manage risk and maintain situational awareness.

3.5.2. This protocol defines how information flows between all offshore parties. This includes construction vessels, support vessels, guard vessels, marine coordination centres, and third-party mariners. The following sections establish the communication methods, reporting structure, and escalation procedures necessary to maintain safe operations.

PRE-OPERATION COMMUNICATION FRAMEWORK

3.5.3. Before offshore works begin, the communication protocol is established and circulated through:

- Notices to Mariners (NtMs): Issued to alert the maritime community to upcoming activities, exclusion zones, and navigational hazards.
- Project Induction and Toolbox Talks: All vessel crews and contractors are briefed on communication requirements, channels to monitor, reporting frequencies, and emergency signals.
- Coordination with Regulatory and Stakeholder Groups: Including the UK Hydrographic Office, Coastguard, fisheries organisations, and nearby asset operators.

3.5.4. This pre-operation framework ensures all relevant parties are aware of the scope, risks, and boundaries associated with the construction activity. Further details are contained in the combined 'CONDITION 3.27: VESSEL MANAGEMENT PLAN & CONDITION 3.29: NAVIGATION AND SAFETY PLAN'.

STANDARD COMMUNICATION CHANNELS

3.5.5. During operations, a consistent set of communication channels is maintained:

- Marine VHF Radio: Channel 16 for distress and initial contact, and Dedicated working channels assigned by the Marine Coordinator.
- Automatic Identification System (AIS): Used for continuous vessel tracking and identification.
- Daily and Shift Reports: Construction vessels, guard vessels, and support units submit operational updates to the Marine Coordination Centre.
- Direct Communication Lines: Phone, satellite link, or digital messaging for coordination between the OIM, Marine Coordinator, and vessel masters.

3.5.6. These channels are always kept active to support real-time decision-making.

COMMUNICATIONS FOR SAFETY AND MITIGATION MEASURES

3.5.7. Clear, timely communication supports the implementation of safety controls and mitigation measures, including:

- Monitoring of Exclusion Zones: Guard vessels and construction units report vessel movements, potential incursions, and boundary breaches immediately to the Marine Coordinator.
- Dynamic Positioning (DP) Alerts: Any loss of redundancy, DP event, or instability is reported instantaneously to all vessels within the operational area.
- Diving and ROV Operations: Dedicated communication lines remain open between the Dive Supervisor/ROV Supervisor and support vessels, with clear protocols for halting vessel movements or thruster use when divers are in the water.
- Weather and Environmental Updates: Forecast changes, rising sea states, or visibility reductions are communicated to all vessels to trigger standby conditions or cease operations if necessary.

- Anchor Spread and Tow Operations: Vessel repositioning, anchor handling movements, and line tension changes are communicated in advance to avoid entanglement or collision risks.

3.5.8. These measures allow the project team to prevent incidents before they develop.

REPORTING STRUCTURE AND FREQUENCY

3.5.9. To maintain situational oversight, specific communication routines are enforced:

- Hourly vessel position reporting where required.
- Regular guard vessel perimeter reports noting traffic and potential risks.
- Daily coordination calls led by the Marine Coordinator or Offshore Construction Manager.
- Shift-change briefings to ensure continuity of information.

3.5.10. All communication is logged to document the operational status and safety conditions throughout the activity.

ESCALATION AND EMERGENCY COMMUNICATION

3.5.11. The communication protocol includes a clearly defined escalation pathway:

- Immediate notification to all vessels in the vicinity in the event of a safety incident, near miss, or equipment failure.
- Marine Coordinator or OIM assumes control, issuing instructions for vessel movement, work suspension, muster, or resource allocation.
- External authorities, such as HM Coastguard, are contacted as required using established emergency procedures.
- Post-incident reporting and debriefing ensures lessons learned are documented and shared.

3.5.12. Fast, structured communication is critical during emergencies to safeguard personnel and assets.

COMMUNICATION RESPONSIBILITIES

3.5.13. Key communication roles include:

- Marine Coordinator: central communication hub, manages zone control and vessel traffic.
- OIM / Offshore Construction Manager: oversees safety decisions and operational authorisation.
- Vessel Masters: maintain listening watch, report status changes, and enforce onboard communication procedures.
- Guard Vessels: provide external communication with third-party mariners and relay information back to the project.

3.5.14. Each party is accountable for timely and accurate communication within their area of responsibility.

SUMMARY

3.5.15. A disciplined communication protocol ensures that all marine construction activities in UK offshore waters are executed safely and efficiently. By maintaining clear information flow, real-time monitoring, and structured escalation, the protocol supports the successful implementation of safety barriers, protects personnel and equipment, and minimises risk to the wider maritime community.

3.6. MONITORING

DAILY INSPECTIONS

3.6.1. Daily inspections shall be undertaken by the Boskalis Subsea Cables and recorded as follows:

- Vessel, equipment and plant inspections shall be completed to check the absence of damage or maintenance issues and that it is correctly functioning.
- Visual inspection of waste containers and waste storage areas to verify wastes are being correctly segregated and to confirm the absence of mixing of hazardous and non-hazardous wastes.

3.6.2. Any elements of the site management found to be in an unsatisfactory condition during the site inspection shall be addressed on the day. In the event it is not possible to address the matter on the day it is raised; a note of the reason why shall be made on the inspection record sheet.

4. PART 2: ENVIRONMENTAL IMPACTS AND CONTROL MEASURES

4.1. OVERVIEW

4.1.1. In this section, commitments stated in the Offshore ES (Appendix B) have been translated into an appropriate format allowing their practical implementation by Boskalis Subsea Cables. This follows the IEMA Practitioner Guide, which states that "the overall objective of an [C]EMP is to provide a continuous link or 'bridge' between the design phase of a Proposed Development, conditions attached to consents, Proposed Development construction, and into the operational phase" (IEMA, 2008).

4.1.2. The complete list of enhancement, mitigation and monitoring commitments, relevant to the activities in this CEMP#2, is provided in Appendix B as a Commitments Register. The Commitments Register has been developed from the commitments made within the Offshore ES, and in compliance with conditions in CML2365. Adherence to this CEMP#2 and accompanying appendices, will therefore ensure compliance with the consents in relation to environmental considerations.

4.2. SUMMARY

4.2.1. This section sets out the environmental management measures governing pre-lay grapnel runs (PLGR), pre-lay boulder relocation (PLBR), and pre-lay mattress installation undertaken in support of the cable works licensed under Marine Licence CML2365. Table 4-1 sets out how all the pre-lay seabed activities will be undertaken in accordance with Marine Licence CML2365.

Table 4-1 – Environmental management measures

Aspect	Requirement	Relevant CML2365 Conditions
Compliance with CML2365	• Marine Licence CML2365 • The Approved Application and Approved Supporting Documents • All relevant conditions contained in Section 3 of the licence	• 3.25 (CEMP submission and implementation) • 3.10 (Notified contractors, vessels, plant only)
Adherence to approved plans and method statements	Pre-lay works shall be undertaken in accordance with: • The approved CEMP (Condition 3.25) • The approved Cable Specification and Installation Plan (CSIP) (Condition 3.19) • Any approved method statements forming part of the Approved Supporting Documents • Any change to approved methods shall be submitted to NRW for written approval prior to implementation.	• 3.19.1–3.19.2 (CSIP approval and implementation) • 3.25.2 (No deviation from approved CEMP)
Precautionary principle and stop-work authority	A precautionary approach shall be always applied. If unexpected seabed features, environmental sensitivities, or risks are identified during PLGR, PLBR, or mattress installation: • Works shall be modified, suspended, or stopped as necessary • NRW shall be notified where required	• 3.7 (Accident or emergency response) • 3.14 (Pollution prevention)

Aspect	Requirement	Relevant CML2365 Conditions

Limitation of Seabed Disturbance	Seabed interaction shall be limited to the minimum necessary to safely install and protect the cables.
	• PLGR:
	  o Limited to clearing obstructions that pose a direct risk to cable installation.
	  o Repeat grapnel runs avoided unless technically justified.
	• PLBR:
	  o Only boulders obstructing cable installation shall be relocated.
	  o Relocation shall occur within the Licensed Area and in accordance with approved methods.
	• Mattress Installation:
	  o Restricted to locations and quantities defined in Appendix 1 of the licence.
	  o Over-installation and unnecessary overlap avoided.
	• Pre-trenching:
	  o Complex geology and sediment mixes along whole route.
	  o Very stiff soils between KP01-KP2.5, KP06-KP9, and KP11-KP34.
	  o De-risks cable burial where plough share could meet refusal.
		• 2.1 Activity 1 (Cable laying and protection)
		• Appendix 1 (Authorised quantities and dimensions)

Depth, Navigation, and Seabed Profile Control	All pre-lay works shall be undertaken such that: • There is no more than a 5% reduction in surrounding depth referenced to Chart Datum • Safe navigation is not compromised • Any exceedance shall require prior written approval from NRW.	• 3.21 (Depth reductions) • 3.13 (Removal of deposits if required for navigational safety)
Seasonal and Temporal Restrictions	• PLGR, PLBR, and mattress installation associated with Licensed Activity 1 shall not take place between **01 November and 31 March inclusive**, unless prior written approval is obtained from NRW.	• 3.18.1 (Time restrictions)
Pollution Prevention and Water Quality Protection	All works shall comply with pollution prevention best practice: • Spill kits and secondary containment always available • Immediate cessation of works if man-made debris enters the marine environment • All pollution incidents shall be reported immediately using the NRW hotline.	• 3.11 (Refuelling restrictions) • 3.14 (Pollution prevention) • 3.15 (Spillage of pollutants) • 3.16 (Prevention of man-made debris)
Biosecurity and Invasive Non-Native Species (INNS)	All vessels, equipment, machinery, and PPE shall be: • Cleaned, washed with freshwater and/or air-dried prior to deployment • Managed in accordance with the approved **INNS Management Plan** at **Appendix C.**	• All vessels, equipment, machinery, and PPE shall be: • Cleaned, washed with freshwater and/or air-dried prior to deployment • Managed in accordance with the approved **INNS Management Plan**.
Marine Ecology and Fauna Protection	PLGR, PLBR, and mattress installation managed to minimise disturbance to marine fauna, including marine mammals and fish, in line with: • The approved **Marine Mammal Management Plan (MMMP)** • The approved CEMP	• 3.26 (Marine Mammal Management Plan) • 3.25.1 (CEMP implementation)

Aspect	Requirement	Relevant CML2365 Conditions
Notification, Monitoring, and Record Keeping	• The Licence Holder shall: • Provide all required pre-commencement notifications • Maintain accurate records of PLGR runs, boulder relocations, and mattress placement • Report completion of works and provide as-built data in accordance with licence requirements	• 3.1–3.6 (Notifications and completion) • 3.32 (Installed cable and pipeline report) • 3.33 (Post-construction as-built report)
Dropped Objects and Emergency Response	• Any dropped objects or accidental deposits shall be managed in accordance with the approved Dropped Object Plan (DOP). Recovery methods shall be approved by NRW prior to implementation.	• 3.7.2–3.7.4 (Dropped Object Plan and recovery)
Adaptive Management	If monitoring or observations indicate that pre-lay works are resulting in greater environmental impact than predicted: • Methods shall be reviewed and adapted • Additional mitigation shall be implemented subject to NRW approval	• 3.25.2 (Implementation of approved CEMP and changes subject to approval)

4.3. MANAGEMENT OF KEY ENVIRONMENTAL ASPECTS AND COMPLIANCE OBLIGATIONS

MARINE PHYSICAL ENVIRONMENT

4.3.1. Potential impacts are increases in suspended sediment concentrations (SSC), sediment deposition, and changes to seabed morphology.

4.3.2. Although there may be localised and temporary increases in SSC, and sedimentation during mattress installation, these areas remain highly resilient to change. This is due to the nature of the activity, which involves lowering mattresses on the seabed at crossing locations that are quickly recoverable and have minimal lasting impact on the seabed.

4.3.3. There is a potential for cable crossing protection installed during the construction phase to impact the seabed morphology and cause secondary scour. Crossing protection will be consistently present throughout the operation and maintenance phase.

4.3.4. Cable crossing protection is the only cable protection measure proposed for the cable installation. This is because the nature of the seabed sediment within the LBCCS Area of Development accommodates cable burial to the required depth. Also noting that the dynamic and highly mobile nature of the Liverpool Bay seabed, means the introduction of artificial habitats and colonisation of hard structures is very low.

4.3.5. These changes may affect habitats over time, but any short-term impacts on seabed morphology will stay within the normal range due to the sand waves' mobility. The eastern migration of sand waves will not be disrupted, and displaced sediment is expected to remain nearby within the same sediment cell.

MARINE BIOLOGICAL ENVIRONMENT

Designated Sites

4.3.6. The statutory nature conservation sites of international importance within 10km of the pre-lay works, are shown in Table 4.2.

Table 4.2 Designated Sites

Site	Designation	Distance from closest crossing
Dee Estuary/Aber Afon Dyfrdwy	Site of Special Scientific Interest (SSSI)	1km
The Dee Estuary	Special Protection Area (SPA) & Ramsar	1km
Dee Estuary/Aber Dyfrdwy	Special Area of Conservation (SAC)	1km
Dee Estuary/Aber Afon Dyfrdwy	Ramsar	1km
Gronant Dunes and Talacre Warren	SSSI	1km
Liverpool Bay/Bae Lepwl	SPA	Within RLB
Mersey Narrows and North Wirral Foreshore	SPA	7km
Mersey Narrows and North Wirral Foreshore	Ramsar	7km
Dee West	Shellfish Protected Area	1km

Benthic Subtidal Ecology

4.3.7. Potential impacts on the benthic subtidal ecology receptors due to the pre-lay activities, were identified in relation to:

- Temporary and long-term habitat loss/disturbance: the impact of placing the pre-lay mattresses, the pre-lay grapnel run, the relocation of boulders and the pre-trenching as a preparatory work for the cable burial will be of negligible. This is because there will be a very small proportion of habitat loss predicted in the context of available habitats in Liverpool Bay and, as most of the disturbed habitat is sedimentary, the habitat is likely to recover rapidly following disturbance/loss. Additionally, there will be no impacts on protected potential reef habitats, as these features are not located where pre-lay activities will take place.
- Increased SSCs and associated deposition: The short-term nature of the impact with sediments when lowering the mattresses quickly dispersing and most of the sensitive receptors being of low sensitivity to this type of impact. No significant effects were predicted on protected potential reef habitats, on the assumption that measures to avoid direct impacts to these features will be implemented. Long-term Subtidal Habitat Loss, offshore cable crossing protection will be required at 33 crossings, with each pre-lay mattress being 6m in length, 3m in width, and 0.3m in height.
- The pre-trenching for the cable burial usually disturbs seabed material over long distances, so it produces the largest sediment plumes up to 15km to the west. This means the suspended sediment cloud moves outside the main study area by about

1 km. This way, the plume can travel far but becomes very dilute. And even if there is high sediment levels when pre-trenching, the increase of sediments only occurs near the trench where most of the heavier material quickly settles back close to pre-trenching area and tidal currents can temporarily re-suspend some of the material, but it settles again.

4.3.8. Given the small scale of pre-lay mattresses to be installed, the narrow corridor for the pre-trenching, and measures such as tapered profiles and compliance with the MCA navigation guidance, it is not expected that impacts from cable crossings would be sufficient to disrupt offshore bank morphological processes or experience significant secondary scour. Any colonisation of cable crossing protection is therefore not expected to be hindered or facilitated by changes in physical processes or secondary scour.

MARINE ARCHAEOLOGY

4.3.9. The area of potential archaeological impact will be within the footprint of the works. Shallow archaeological remains may be affected by the activities, for example through boulder relocation, and the pre-lay grapnel run. A Written Scheme of Investigation (WSI) has been prepared as 'Project Design for Archaeological Monitoring and Recording'. The WSI is presented at Appendix D.

4.3.10. As described in Section 1.1, the cable installation works will be included in CEMP #3, which will be submitted for approval in February 2026, in advance of the cable laying works planned for June–September 2026.

4.3.11. In the unlikely event that remains of very high significance are identified, the Archaeological Fieldwork Contractor will inform the Archaeological Consultant immediately, who will then consult with the Heneb Archaeological Advisor.

4.3.12. The WSI has been prepared to comply with Marine Licence Condition# 3.24. The following outlines the strategy for managing any archaeological finding within the LBCCS project.

4.3.13. TAEZs have been assigned where remains are thought to be of medium, high or uncertain archaeological. All wreck remains which lie within the Area of Physical Project Work and LBCCS Development Area, have been recommended either AEZs or TAEZs.

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

4.3.15. A WSI and PAD has been prepared and will be implemented during all CEMP#2 activities and is presented in Appendix D (CML2365- Condition #3.24). It addresses the reporting of unexpected finds of archaeological material, recovered from the sea during these activities

4.3.16. Supporting documentation to reported finds will be implemented through the measures set out in the PAD, including further surveys or establishment of new AEZs if appropriate, Geophysical and GIS maps showing find locations, photographic log, video stills, stratigraphic drawings and specialist appendices, raw data tables, WSI and PAD.

SHIPPING AND NAVIGATION, COMMERCIAL FISHERIES, AND OTHER MARINE USERS

4.3.17. The potential impacts on shipping and navigational receptors due to the Pre-lay Activities in this CEMP#2 would be: vessel displacement leading to increased vessel-to-vessel collision risk between third-party vessels; increased vessel-to-vessel collision risk between a third-party vessel and a project vessel; vessel-to-platform allision risk; reduced access to local ports; fishing gear interaction with mattresses; and vessel grounding due a reduction in under keel clearance.

4.3.18. Most of these impacts were deemed to be of broadly acceptable adverse significance to the shipping and navigation receptors. Mitigation measures include regulations to reduce collision likelihood, a 500m safety zone around infrastructure, circulation of information to mariners and fishers, and the use of guard vessels where necessary. Cumulative effects were assessed, and no significant cumulative effects were identified for any plans, projects, or activities in the CEA for shipping and navigation. No transboundary effects regarding shipping and navigation from the Pre-lay Activities were predicted on the interests of other states.

4.3.19. Potential impacts on commercial fisheries due to the Pre-lay Activities were identified, including loss or restricted access to fishing grounds; impacts on commercially valuable fish and shellfish species/resources; interference with fishing activity; temporary increases in steaming distances to fishing grounds; and loss or damage to fishing gear due to snagging on project infrastructure.

4.3.20. Most of these impacts, with the implementation of mitigation measures, would be negligible or minor, and not significant. However, loss or restricted access to fishing grounds was deemed of moderate adverse significance to the UK potting fishery, and minor adverse significance to shipping and navigation receptors.

4.3.21. Additional mitigation is proposed to reduce this impact to minor adverse significance through the justifiable disturbance payment procedure. Impacts on commercially valuable fish and shellfish species/resources were deemed of minor adverse significance, with temporary noise and seabed disturbances potentially displacing populations but with a lessened impact due to localised spatial extent. Interference with fishing activity, temporary increases in steaming distances, and loss or damage to fishing gear were all deemed minor.

4.3.22. The potential impact on infrastructure and other users due to the Pre-lay Activities to existing cables or pipelines or restrictions on access to cables or pipelines would be minor. With the measures adopted as part of the Pre-lay Activities in place (e.g., commercial crossing agreements), these impacts are not significant.

4.3.23. Displacement of recreational activities was deemed to be negligible, allowing recreational vessels to alter their routes. Increased SSCs and associated deposition affecting recreational diving and bathing sites were deemed to be negligible. Impacts to existing cables or pipelines or restrictions on access to cables or pipelines were deemed to be minor, with established mechanisms for controlling the level of impact. Cumulative effects were assessed for displacement of recreational activities and increased SSCs and associated deposition affecting aggregate extraction areas, with no significant cumulative effects identified.

4.3.24. The approach to management and mitigation of potential impacts on shipping and navigation, and other marine users is described in the following plans prior to construction, which are not included under the CEMP:

- FLCP;
- Vessel management plan (VMP) (submitted under Condition 3.27); and
- Lighting and marking plan (LMP) (submitted under Condition 3.29).

4.3.25. Some of the specific measures adopted by these plans are:

- the adoption of advisory safety zones;
- appropriate notification of activities to other marine users;
- a clear process of marine coordination of all vessels and vessel activity;
- appropriate marking and lighting of vessels; and
- vessel transit planning, commercial fisheries relations, and management of commercial fisheries interactions.

WASTE MANAGEMENT PLAN

General Principles

4.3.26. Boskalis Subsea Cables will follow a waste hierarchy approach: eliminate, reduce, reuse, recycle, and dispose, and will comply with the Waste Duty of Care Code of Practice.

4.3.27. All waste management activities onboard the cable laying vessel will be conducted in accordance with UK legislation and applicable international maritime requirements, including the provisions of MARPOL as administered by the International Maritime Organization, and enforced within UK waters by the Maritime and Coastguard Agency.

4.3.28. As the producer of the waste, it is the duty of BSC vessel management to ensure that the waste is contained and stored, so the risks of discharge during transfer are as Low as Reasonably Practicable (ALARP).

4.3.29. Prior to the transfer of waste, the containers shall be inspected and properly secured. The labelling of waste for transport is governed by legislation and IMDG Code. Regulations define the packaging and labelling requirements that apply to defined waste types. As a minimum, the description should cover the following key points:

- Labelling and packaging of waste according to local regulations.
- Waste Classification & Identification Code Numbers.
- The quantity of the waste.
- The name and / or address of the site where it is originated.

4.3.30. BSC employees and contractors will only transfer their wastes to an authorized person who is licensed to accept the material being disposed of.

4.3.31. Each transfer of waste (Project → Waste Carrier; Waste Carrier → Waste Processing Facility) will be supported by a Controlled Waste Transfer Note.

4.3.32. Boskalis Subsea Cables and contractors will maintain records of all waste transfers in a Hazardous Waste Consignment Note (HWCN), which can be made available to NRW, if

requested. HWCN will be returned to Boskalis Subsea Cables and filed for the proper duration in accordance with the relevant legislation.

4.3.33. ISM classed vessels will maintain a log of discharged hazardous wastes in the vessel's Garbage Record Book in accordance with MARPOL.

4.3.34. To reduce spills and leaks, hazardous materials storage and refuelling will be managed as follows:

- Plant nappies of suitable size will be always placed under static plant & equipment. Drip trays will be used if plant nappies are not available.
- Regularly check the equipment for leaks. Leaking equipment will be taken out of service and maintained.
- Use secondary containment systems with a 110% capacity.
- Keep spill kits available near storage areas. If spill kits are utilised to contain a spill on site, the products will be replenished for future use.
- Refuel in designated areas away from water bodies.
- Supervise all fuel transfers and ensure appropriate protective measures are in place.
- Where possible, refuelling should only be carried out in a designated area, which will be secured/locked out of hours.
- Refuelling will always be supervised by a competent supervisor and according to a strict and monitored process..
- All hazardous materials shall be labelled, sealed and stored with their Control of Substances Hazardous to Health (COSHH) assessment in a bunded and lockable container away from drains and watercourses when not in use.
- COSHH datasheet will be read and understood before using any hazardous materials.
- Any spent (contaminated) spill kits, absorbent granules, sheets or fibres must be disposed of in accordance with COSHH regulations requirements.
- Hazardous liquids shall be transferred using a funnel and drip tray and sealed and returned to the container immediately after use. Damaged containers shall be reported to the Field Environmental Manager.
- All usages shall comply with its requirements.
- Hazardous liquids must be re-sealed after use. Empty containers are to be disposed of to the designated container within the waste compound.

WASTE SEGREGATION AND STORAGE

4.3.35. Vessel-specific Waste Management Plans are implemented and maintained onboard all the vessels used for the works. These require all waste streams to be segregated at source into clearly labelled containers, including:

- General (non-hazardous) waste.
- Recyclable materials (e.g. metals, plastics, paper, and cardboard).
- Food waste.
- Hazardous waste (e.g. oily rags, chemicals, batteries, paints, and aerosols).

4.3.36. Dedicated, enclosed waste storage areas will be provided to prevent loss overboard, cross-contamination, or exposure to weather. Containers will be always secured, particularly during deck operations and adverse weather conditions.

Food Waste and Domestic Waste

4.3.37. Food waste will be managed in compliance with applicable discharge regulations. Where discharge is not permitted, food waste will be macerated and retained onboard for disposal at a licensed port reception facility. Domestic waste generated by crew activities will be compacted where practicable to minimise storage volumes and returned to shore for appropriate treatment or recycling.

Hazardous and Oily Wastes

4.3.38. Hazardous wastes will be stored in designated, bunded containers and handled only by trained personnel. Oily wastes, including bilge water and used lubricants, will be managed using approved onboard systems such as oily water separators and sludge tanks. No discharge of oily waste will occur except when fully compliant with regulatory limits and monitoring requirements.

Operational and Project-Specific Wastes

4.3.39. Waste generated from cable installation activities (e.g. packaging, protective materials, damaged components) will be collected promptly from work areas and transferred to designated storage locations. Cable drums, pallets, and other reusable items will be returned to suppliers or shore bases where practicable.

Shore Disposal and Record Keeping

4.3.40. All waste landed ashore will be transferred to licensed waste contractors at approved port facilities. Waste transfer notes and disposal records will be retained onboard and made available for inspection. The vessel's Garbage Record Book and Oil Record Book will be maintained in accordance with regulatory requirements.

Training and Environmental Awareness

4.3.41. All crew members will receive waste management and environmental awareness training as part of vessel induction. Regular toolbox talks and audits will be conducted to ensure continued compliance, promote waste minimisation, and prevent accidental discharges to the marine environment.

MARINE POLLUTION CONTINGENCY PLAN

Emergency Response Plan

4.3.42. Both Boskalis Subsea Cables and Subcontractor's employees, plus all others involved in the project are required to adhere to the Project specific Emergency Response Plan (ERP), which is outlined in the following sections. The ERP forms an integral part of the Project and is the primary document for Emergency Response activities. The ERP sets out the specific policies, practices, resources and activities relevant to the project.

4.3.43. In the event of any uncontrolled spillage into the marine environment, the initial response shall focus on identifying the source, containing the discharge and assessing the location

and potential spread. If the spill originates from a vessel or from a vessel-based operations, the initial offshore response shall be led by the Vessel Master, who is required to activate the vessel's Shipboard Oil Pollution Emergency Plan (SOPEP). All project vessels and sites are equipped with Spill kits compliant to their respective SOPEP requirements. Where necessary, additional containment and clean-up equipment will be mobilised to meet project or location-specific risk levels. In the event of a spill, Boskalis Subsea Cables is responsible for: • Ensuring spill response procedures are in place before work is initiated.

- Immediately notify Liverpool Bay CCS Limited;
- Liaising with statutory bodies (e.g. MCA, NRW) as required;
- Coordinating and executing the initial spill response actions;
- Managing follow-up actions in compliance with applicable marine pollution legislation.

4.3.44. Pollution incidents are categorised under a Tiered Response Framework based on severity and the scale of required resources:

- Tier 1: Minor spills that can be handled using onboard equipment and crew;
- Tier 2: Moderate spills requiring external support within regional capacity;
- Tier 3: Major spills with potential for widespread environmental damage. Spills originating from vessel operations on this project are expected to fall under Tier 1, barring a catastrophic incident. All spillages are to be reported in the 1st instance to the MCC.

4.3.45. In the event of a dropped object (see Section 0) in the marine environment, initial focus will be on identification of the dropped object and assessment of the location. In the case that recovery is required; an assessment shall be made to the viability of recovery operations. In case Report any dropped objects left behind to MCC and local authorities

- Environmental Hazard: Coastguard, Fishery Department
- Shipping Hazard: Coastguard, Fishery Department
- Marine Hazard: Coastguard, Fishery Department, Environmental Department

4.3.46. Regarding notification Minimum communication equipment available on the vessels, are VHF that operate within 30 nautical miles of the nearest point of land. A VHF radio using the digital Selective calling (DSC) is also used to allow notifying all the nearby vessels for assistance in case of an incident.

4.3.47. While the first notification is taking place, every emergency is managed by Boskalis Subsea Cables site-specific emergency response plan and then all the notifications are made to:

- the Project Management Team (PMT).
- the Marine Control Centre (MCC) that informs Liverpool Bay CCS Limited about the situation.
- Liverpool Bay CCS Limited will coordinate external notifications, including to HM Coastguard, where applicable and in line with jurisdictional boundaries.
- In the CDM area, BOSKALIS is responsible for immediate notification to HM Coastguard. Boskalis Security Office at the Head Office in Papendrecht will provide

24/7 coverage to handle emergency notification in the event direct communication with the PMT proves difficult.

Spill Kits

4.3.48. Spill kits for hydrocarbon and chemical spills will be available at all worksites, with clear signage for easy identification. The site team shall ensure:

4.3.49. Additional spill kits are located at construction compounds, fuel storage points, and COSHH stores.

4.3.50. Each kit will include:

- Absorbent pads.
- Absorbent booms.
- Absorbent granules.
- Hazardous waste disposal sacks.

4.3.51. Regular checks will ensure spill kits are fully stocked and ready for use.

4.3.52. Spill drills will be conducted periodically to ensure the workforce can effectively handle spills.

4.3.53. All drills will be documented, with records kept throughout the project.

Extreme Weather

4.3.54. Boskalis Subsea Cables' Site Manager shall register to receive Met Office weather warnings. All warnings issued by the Met Office with the potential to impact upon the works shall be communicated by the Construction Manager to the workforce in a timely manner so that measures can be implemented where necessary. In the absence of the Construction Manager the Field Environmental Manager or equivalent person shall also receive and act upon all alerts.

INCIDENT REPORTING AND INVESTIGATION

Incident Response

4.3.55. All pollution incidents should be managed through the STOP – CONTAIN – NOTIFY concept. As soon as an incident is identified, the first action should be STOP and prevent further discharge to drainage/river/ground.

4.3.56. CONTAIN may constitute control of discharge in the event of a spill, or cessation of works if it is the works that are resulting in the incident, e.g. halting excavations until silt runoff is contained. It is recognised that due to personal health and safety risks it may not always be safe to stop the source of the spill, for instance if a significant volume of an unidentified substance has been released.

4.3.57. NOTIFICATION should take place as soon as practicable and frequently can take place while further release is being stopped or while a spill is being contained. The emergency contact numbers outlined in Table 4.3 should be used.

Reporting

4.3.58. Specific details concerning how different types of emergencies will be responded to, and the key responsibilities of the parties involved, will be documented in the Operational Interface Document currently being finalised within LBCCS to ensure an efficient and timely response to any emergency.

4.3.59. Reporting and Investigating of Incidents will follow Boskalis procedure. Below serves as a summary of Boskalis policy, highlighting Environmental aspects for this Project

4.3.60. In line with Boskalis Subsea Cables' policy on open reporting, Boskalis Subsea Cables will report all incidents to the Liverpool Bay CCS Limited's Project Team and HSE Manager without delay (within 24hr in any case) and subsequently by initial written report within 3 working days. A final written report will be issued once any necessary investigations have been carried out.

4.3.61. The final report will contain details of any root cause of the incident, along with details of the agreed corrective and / or preventative measures being taken to prevent a similar occurrence.

4.3.62. All environmental accidents and near-misses will be reported and investigated in line with Boskalis Subsea Cables' stated procedures.

4.3.63. Any incident which has resulted in an environmental impact, and any significant environmental impact incident shall be reported immediately and without delay by the OCM to the Liverpool Bay CCS Limited's Offshore Site Representative, the Liverpool Bay CCS Limited HSE Manager and the Marine Coordinator without delay by telephone.

4.3.64. Roles and responsibilities are clearly defined within the process and will be followed accordingly

Environmental Incidents (Oil or Chemical Discharge)

4.3.65. Any release to sea of oil or offshore chemicals from a vessel must be reported to OPRED via a PON1 form.

4.3.66. Reporting is done through the Integrated Reporting Service (IRS) on the UK Energy Portal by LBCCS.

4.3.67. No minimum threshold applies even small discharges must be reported.

Loss of Materials to Sea

4.3.68. If a vessel loses equipment or materials overboard, report via PON2 (Loss or deposition of materials to sea) through IRS. Dropped Objects Plan will be submitted with this CEMP #2 to prevent and manage the risk of dropped objects, ensuring compliance with UK regulations and industry best practice (DROPS) applicable to vessels and associated activities within the UK.

Safety of Major Accident Events

4.3.69. Report to OMAR (Offshore Major Accident Regulator) using the ROGI form for incidents under:

- Offshore Safety Directive Regulations (SCR2015)
- RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)
- Submit ROGI forms by email to OMAR.reporting@hse.gov.uk

Emergency Contacts

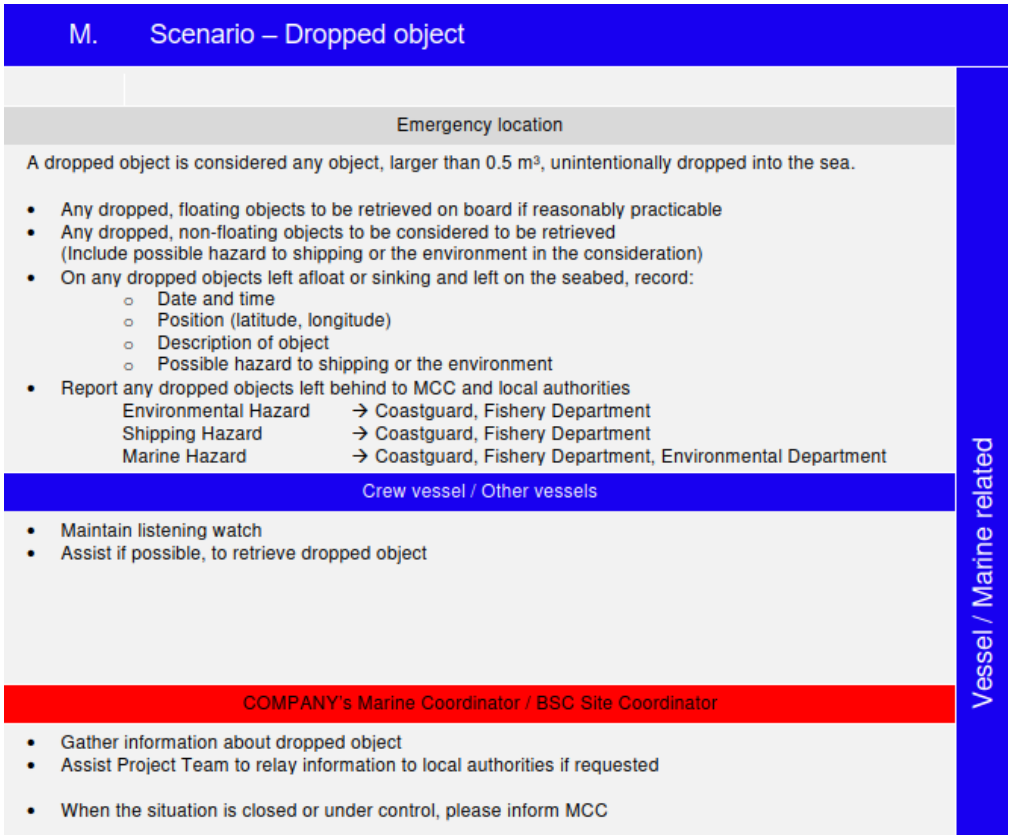
4.3.70. In the event of an emergency occurrence at the Site, the Client and Boskalis Subsea Cables shall determine the relevant statutory and regulatory bodies that must be notified. Notification shall be in accordance with the measures outlined above in Section Error! R eference source not found..

Table 4.3 Emergency Contacts

Emergency Contacts	
Contact	Contact Details
Paul Gibson – project manager BSC	+44 (0) 7976 720 597
Willem de Wit- Package Manager Offshore BSC	+31 6 1928 3902
Guy Lister - Package Manager (Onshore) BSC	+44 (0) 780 1161 7526
Tito Dimitri- Project Manager- LBCCS	+44 7717 715 342
National Resources Wales	0300 065 3000
Health and Safety Executive (HSE Construction)	01519 229 235
Local Authority – Flintshire County Council	Switchboard 01352 752121
Fire	999 / 112
Police	999 / 112
Ambulance	999 / 112

Dropped Objects

4.3.71. A 'Dropped Object' is one of the unplanned event scenarios identified in the Boskalis Subsea Cables risk identification processes. In the event of a dropped object in the marine or intertidal environment, the initial priority shall be to identify the dropped item, assess the location and evaluate any risk to personnel, equipment, the marine environment and Liverpool Bay CCS Limited assets. If recovery is feasible and does not introduce additional unacceptable risks, recovery operations shall be undertaken promptly and safely. The following graphic gives an overview of the procedure.



4.3.72. If recovery is not viable, the unrecovered dropped object shall be reported as an environmental and safety incident and notified to the relevant authorities and Liverpool Bay CCS Limited within 24 hours, in accordance with Liverpool Bay CCS Limited and regulatory requirements.

4.3.73. Prior to mobilisation, an assessment shall be conducted to identify potential dropped object hazards associated with all lifting and over-side operations, including:

- Boulder relocation, pre-lay grapnel run, and mattress installation operations;
- Transfers of equipment and materials to or from Liverpool Bay CCS Limited platforms and vessels;
- Any mobilisation or demobilisation activities at quaysides, vessels or platforms.
- Note: Flexible Bulk Carriers shall not be used for lifting equipment or materials, as their design does not ensure load stability during hoisting.

4.3.74. Potential causes of dropped objects include:

- Poorly secured tools or equipment within a slung load;
- Uncontained fluids (fuel, oils inadvertently discharged or spilled;
- Failure of lifting equipment or use of equipment outside its designed purpose;
- Inadequate securing of components during transfers to or from Liverpool Bay CCS Limited platforms or during over-boarding operations.

4.3.75. Mitigation measures shall include:

- Use of certified and inspected lifting equipment;
- Development of site- and operation-specific lifting plans that cover marine and platform operations;

- Tool & equipment tethering wherever practicable;
- Designated spotters during critical lifts or transfers to/from platforms;
- Pre-task briefings and toolbox talks to ensure awareness of dropped object hazards;
- Immediate securing or recovery of any item at risk of falling overboard or from height.

4.3.76. All personnel shall remain vigilant for dropped object hazards and report any incidents or near-misses immediately to the Supervisor or Project Manager. A Dropped Objects Reporting Form, and Spill Notification Form are presented in Appendix E, and Appendix F, respectively.

APPENDIX A: PROJECT LAYOUT PLAN (CHART WITH COORDINATES AND ZONES).

460000 470000 480000 490000

5950000 5940000 5930000 5920000

GRID NORTH

OFFSHORE LOADING UNIT

HAMILTON NORTH
-22.1M WD
E:468497.20
N:5944503.30

LIVERPOOL BAY WESTMINSTER GRAVELS LTD

ESAT2 COMMUNICATIONS CABLE

EXA NORTH AND SOUTH (FKA GTT ATLANTIC)

TELIA SONERA EU DARK FIBRE

ROCKABILL CABLE

LENNOX
-8.5M WD
E:488424.64
N:5942739.60

35m 30m

EXISTING 14" GAS EXPORT
EXISTING POWER CABLE
PROPOSED CABLE
N.T.S

PROPOSED CABLE
EXISTING 16" GAS EXPORT
EXISTING 14" OIL EXPORT +2" METHANOL
EXISTING 12" GAS INJECTION (DISUSED)
EXISTING 20" GAS EXPORT +2" METHANOL
EXISTING 12" GAS INJECTION
30m 30m 30m 30m 30m
N.T.S

12nM OFFSHORE TERRITORY

CONWY PLATFORM

SOUTHPORT

HAMILTON EAST

SPOIL GROUND

ANCHORAGE ZONE

HAMILTON MAIN
-25.8M WD
E:469999.75
N:5935548.30

DHNX-5 DHNX-6 DHNX-4 DHNX-3 DHNX-2 DHNX-1 DHMX-1

DLX-6 DLX-5 DLX-4 DLX-3 DLX-2 DLX-1 DHMX-5 DHMX-4 DHMX-3 DHMX-2

DOUGLAS CCS
-29M WD
E:461477.79
N:5932596.10

POAX -10 POAX-9 POAX -9 POAX -8 POAX -7 POAX-10 POAX-9 POAX-8 POAX-7

WESTERN LINK HVDC CABLE

SPOIL GROUND

HANSON AGGREGATES MINING AREA

EXISTING 12" GAS INJECTION
PROPOSED CABLE
30m
N.T.S

ANCHORAGE PROHIBITED

BURBO BANK

BURBO BANK EXTENSION

HIBRE SWASH MERSEY SAND MINING AREA

GWYNT-Y-MOR WIND FARM

GWYNT-Y-MOR WIND FARM

10Nm OFFSHORE BUFFER AROUND LBA

NORTH HOYLE WIND FARM

LIVERPOOL BAY

POAX -6 POAX-6 POAX -5 POAX-5 POAX-4 POAX -4 POAX-3 POAX -3 POAX-2 POAX -2 POAX-1 POAX -1

DW5
RESURGAM
E:463158.80
N:5916618.00

RHYL FLATS WIND FARM

PROPOSED CABLE No. 1
PROPOSED CABLE No. 2
EXISTING 20" PIPELINE
90m
120m
N.T.S

EIRGRID COMMUNICATIONS CABLE

FOR NEARSHORE CABLE ROUTING SEE SHT 2

WEST HOYLE BANK

WEST HOYLE SPIT

EAST HOYLE

WELSH CHANNEL

FOR ONSHORE CABLE ROUTING SEE DRG. No. 1025H0BSDG84100

HILBRE POINT

DEE ESTUARY

RHYL FLATS

(POINT OF AYR - DOUGLAS CCS) ROUTE CROSSING TABLE - CABLE #1 (Offshore Overall length = 34.36 Km)

Tag No.	KP	Easting	Northing	Description of Crossing
PoAX-1	9+837	470982.10	5916031.50	BURBO BANK Wind Farm
PoAX-2	12+084	468802.92	5916564.54	NORTH HOYLE Wind Farm (Export Cable)
PoAX-3	12+103	468784.06	5916566.12	NORTH HOYLE Wind Farm (Export Cable)
PoAX-4	19+255	461926.24	5917785.34	GWYNT-Y-MOR Wind Farm (Export Cable)
PoAX-5	19+317	461898.51	5917837.67	GWYNT-Y-MOR Wind Farm (Export Cable)
PoAX-6	26+203	461743.35	5924702.50	GWYNT-Y-MOR Wind Farm (Inter Array Cable)
PoAX-7	32+284	461743.35	5930783.12	WESTERN LINK HVDC CABLES - POLE 1
PoAX-8	32+315	461743.35	5930814.39	WESTERN LINK HVDC CABLES - POLE 2
PoAX-9	33+668	461762.79	5932068.87	EXISTING 2 x 3" CONDENSATE (PL 1032 + 1033) TO PoA
PoAX-10	33+681	461751.39	5932074.01	EXISTING 20" GAS (PL 1030) TO PoA

(POINT OF AYR - DOUGLAS CCS) ROUTE CROSSING TABLE - CABLE #2 (Offshore Overall length = 34.46 Km)

Tag No.	KP	Easting	Northing	Description of Crossing
PoAX-1	9+842	470974.84	5916002.39	BURBO BANK Wind Farm
PoAX-2	12+089	468795.03	5916535.10	NORTH HOYLE Wind Farm (Export Cable)
PoAX-3	12+108	468776.17	5916536.68	NORTH HOYLE Wind Farm (Export Cable)
PoAX-4	19+276	461904.20	5917763.30	GWYNT-Y-MOR Wind Farm (Export Cable)
PoAX-5	19+338	461875.07	5917837.57	GWYNT-Y-MOR Wind Farm (Export Cable)
PoAX-6	26+248	461713.35	5924702.50	GWYNT-Y-MOR Wind Farm (Inter Array Cable)
PoAX-7	32+333	461713.35	5930787.10	WESTERN LINK HVDC CABLES - POLE 1
PoAX-8	32+364	461713.35	5930818.38	WESTERN LINK HVDC CABLES - POLE 2
PoAX-9	33+671	461757.62	5932038.30	EXISTING 2 x 3" CONDENSATE (PL 1032 + 1033) TO PoA
PoAX-10	33+682	461747.58	5932042.82	EXISTING 20" GAS (PL 1030) TO PoA

Power Cable from DOUGLAS CCS to HAMILTON NORTH (Overall Length = 14.86Km)

Tag No.	KP	Easting	Northing	Description of Crossing
DHNX-1	1+528	460909.46	5933939.93	8" (PL 2939) Production to CONWY
DHNX-2	1+530	460909.49	5933940.04	3" (PL 2941) Condensate PL to CONWY
DHNX-3	1+570	460920.54	5933978.53	8" (PL 2940) Water Injection Pipeline to CONWY + Control Umbilical (PLU 2942) from Douglas to CONWY
DHNX-4	2+908	461482.09	5935104.25	14" Oil Export (PL 1031) to OLU
DHNX-5	3+522	462068.24	5935289.42	14" Gas Export (PL 1041) + 2" Methanol (PL 1042) from Hamilton North
DHNX-6	3+569	462112.27	5935303.33	Existing Power Cable to Hamilton North

Power Cable from DOUGLAS CCS to LENNOX (Overall Length = 32.31 Km)

Tag No.	KP	Easting	Northing	Description of Crossing
DLX-1	1+494	460930.88	5933905.83	8" (PL 2939) Production to CONWY
DLX-2	1+495	460931.03	5933906.36	3" (PL 2941) Condensate PL to CONWY
DLX-3	1+534	460941.84	5933944.00	8" (PL 2940) Water Injection Pipeline to CONWY
DLX-4	2+855	461479.34	5935071.92	14" Oil Export (PL 1031) to OLU
DLX-5	3+442	462039.41	5935248.85	14" Gas Export (PL 1041) + 2" Methanol (PL 1042) from Hamilton North
DLX-6	3+489	462084.05	5935262.96	Existing Power Cable to Hamilton North

Power Cable from DOUGLAS CCS to HAMILTON MAIN (Overall Length = 11.03 Km)

Tag No.	KP	Easting	Northing	Description of Crossing
DHMX-1	0+192	461641.61	5932665.06	14" Oil Export (PL 1031) to OSi
DHMX-2	0+214	461660.32	5932675.61	14" Gas Export (PL 1041) + 2" Methanol (PL 1042) from Hamilton North
DHMX-3	0+270	461709.68	5932703.42	16" Gas Export (PL 1035) from Lennox
DHMX-4	0+335	461766.29	5932735.31	20" Gas export (PL 1039) + 2" Methanol (PL 1040) from Hamilton Main
DHMX-5	0+371	461797.52	5932752.91	12" Gas Injection (PL 1036A) to Lennox

REFERENCE DOCUMENTS

NUMBER	TITLE
1025H0BSDG84100	NEW OFFSHORE POWER CABLE AND FIBRE OPTIC FIELD LAYOUT (ONSHORE SECTION)
1025H0BGRV09422	PIPELINE / CABLE ROUTE ENGINEERING GEOLOGICAL GROUND MODEL
1025H0BGRV09420	PHASE 2C NEARSHORE ENGINEERING GEOLOGICAL GROUND MODEL
1023DSBNDN85018	CABLE INSTALLATION AND MARINE OPERATIONS DRAWINGS
1025HTBNDN85020	NEARSHORE CABLE MARINE OPERATIONS DRAWINGS

KEY PLAN

GENERAL NOTES

1. ALL DIMENSIONS AND COORDINATES ARE IN METRES UNLESS NOTED OTHERWISE.
2. GLOBAL COORDINATE REFERENCE SYSTEM: European Datum 1950 UTM Zone 30N (EPSG: 23030)

PROJECTED COORDINATE SYSTEM	European Datum 1950 UTM Zone 30N
PROJECTION	TRANSVERSE MERCATOR
LINEAR UNIT	METERS (1.0)
FALSE EASTING	500000.0
FALSE NORTHING	0.0
CENTRAL MERIDIAN	-3.0
SCALE FACTOR	0.9996
LATITUDE OF ORIGIN	0.0
GEOGRAPHIC COORDINATE SYSTEM	European Datum 1950
ANGULAR UNIT	DEGREE (0.0174532925199433)
PRIME MERIDIAN	GREENWICH (0.0)
DATUM	European 1950
SPHEROID	International 1924
SEMIMAJOR AXIS	6378388.0
SEMIMINOR AXIS	6356911.946127946
INVERSE FLATTENING	297

3. CABLE ROUTING AND CROSSINGS ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON SURVEY INFORMATION.
4. WATER DEPTHS AND SHIPWRECKS (WK) ARE GIVEN FOR INFORMATION ONLY.
5. LAYOUT IS COMPILED FROM VARIOUS SOURCES AND THEREFORE IS SUBJECT TO CONFIRMATION.
6. PRELIMINARY ROUTING BASED ON EXISTING SEABED ARCHITECTURE AROUND EACH PLATFORM.
7. DELETED.
8. CABLE APPROACH TO EACH PLATFORM TO BE CONFIRMED.
9. FIELD LAYOUT BASED ON THE PRELIMINARY LOCATION OF NEW J-TUBES AT EXISTING PLATFORMS (HAMILTON MAIN, HAMILTON NORTH, LENNOX) AND DOUGLAS CCS PLATFORM.
10. FINAL LOCATION OF J-TUBES AT DOUGLAS CCS PLATFORM TO BE CONFIRMED.
11. DRILLING JACK-UP CORRIDOR AND FOOTPRINT AROUND PLATFORMS TO BE CONFIRMED.
12. FIELD LAYOUT TO BE REVIEWED AGAINST THE DECOMMISSIONING SCOPE FOR THE PROJECT.
13. FOR ONSHORE CABLE ROUTING REFER TO DRAWING No. 1025H0BSDG84100.
14. FOR POWER CABLE ALIGNMENT SHEETS SEE:

OFFSHORE POWER CABLE - PoA TO DOUGLAS CCS (CABLE No. 1)	- 1025HOBSDG84110
OFFSHORE POWER CABLE - PoA TO DOUGLAS CCS (CABLE No. 2)	- 1025HOBSDG84141
OFFSHORE POWER CABLE - DOUGLAS CCS TO HAMILTON NORTH	- 1025DSBSDG84142
OFFSHORE POWER CABLE - DOUGLAS CCS TO LENNOX	- 1025DSBSDG84143
OFFSHORE POWER CABLE - DOUGLAS CCS TO HAMILTON MAIN	- 1025DSBSDG84144
ONSHORE POWER CABLE - PoA TO JUNCTION BOX	- 1025HTBLDL80026
ONSHORE POWER CABLE - PoA TO JUNCTION BOX	- 1025HTBLDL80027

LEGEND

- PROPOSED CABLE (2 OFF) ROUTE (POINT OF AYR - DOUGLAS CCS) - 34 Km
- PROPOSED CABLE ROUTE (DOUGLAS CCS - HAMILTON MAIN) - 11 Km
- PROPOSED CABLE ROUTE (DOUGLAS CCS - HAMILTON NORTH) 15 Km
- PROPOSED CABLE ROUTE (DOUGLAS CCS - LENNOX) 32 Km
- MARINE TRAFFIC (SHIPPING LANES)
- EXISTING POWER CABLES
- EXISTING PIPELINES / UMBILICALS / POWER CABLES
- AREA LIMITS
- XX Wk — SHIPWRECK LOCATION
- 110/XX-XX — ABANDONED WELL LOCATION AND IDENT
- WIND TURBINE (NOT INDICATIVE OF LOCATION)
- OFFSHORE WIND FARM POWER CABLE CORRIDORS

Validity Status	Rev. Number	Date	Description	Prepared	Checked	Approved	Approved Eni UK
CD-FE	10	07.09.2023	RE ISSUED FINAL	N.Z	E.R	S.G	
CD-FE	09	11.08.2023	RE ISSUED FOR COMMENT	N.Z	E.R	S.G	
CD-FE	08	14.04.2023	RE ISSUED FINAL	N.Z	E.R	S.G	
CD-FE	07	29.03.2023	RE ISSUED FOR COMMENT	N.Z	E.R	S.G	

Revision index

Company logo and business name: eni uk / eni progetti

Company Document ID: 1025H0BSDG84104

Job. N. JA0614

Facility and Sub Facility Name	Project Name	Scale	Sheet of Sheets
DOUGLAS SUBSEA	LBA CCS Transport and Storage	1:75k @A1	1 / 2

Document Title

NEW OFFSHORE POWER CABLE AND FIBRE OPTIC FIELD LAYOUT (OFFSHORE SECTION)

Supersedes N.

Superseded by N.

Plant Area	Plant Unit
N/A	N/A

Software:AutoCad

Filename.1025H0BSDG84104_CDFE10_01_02.DWG

A1 (841 x 594)

APPENDIX B: SUMMARY OF ENHANCEMENT, MITIGATION AND MONITORING COMMITMENTS

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
MM1	x	x		Scour protection (e.g. rock berms) will only be used at third-party cable crossings and monitored as per MM3.	To reduce the potential for scouring of seabed sediments to occur.	To reduce interactions between metocean regime (wave, sand and currents) and seabed structures.		x				x						P
MM2	x	x	x	Suitable implementation and monitoring of Cable Protection	Suitable implementation and monitoring of cable protection informed by a Cable Burial Risk Assessment (CBRA). Cables will be buried to a target depth of 2-3m and only be protected using external protection (e.g. rock berms) at third-party crossings.	Minimises the risk of underwater allision with cable protection, anchor or fishing gear interaction with subsea cables and interference with magnetic position fixing equipment.						x	x					T
MM4	x	x		Cable protection to have a profiled cross section and height mitigated to < 1 m	To minimise changes to physical processes such as tidal current, wave regime and sediment transport pathways, particularly if located in shallow water.			x										P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
MM5	x	x	x	No external cable protection in the intertidal area.	To minimise potential impacts on intertidal habitats within the Dee Estuary Special Area of Conservation (SAC) and Special Protection Areas (SPA).	Trenchless techniques (e.g. Horizontal Directional Drilling (HDD)) will be used for cable installation which will not result in any direct habitat disturbance or scour to intertidal habitats		x	x									P
MM7	x	x	x	Development of and adherence to an Environmental Management Plan (EMP) that will be prepared and implemented during the construction, operational and maintenance and decommissioning phases of the Proposed Development. The EMP will include appendices detailing actions to minimise INNS (the INNSMP), and a MPCP will be developed which will include planning for	Measures will be adopted to ensure that the potential for release of pollutants from construction, operational and maintenance and decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and	Provides a means to ensure the efficient management and communication of commitments made for the management of the potential environmental impacts.	Outline EMP, with INNSMP	x	x			x					Secured within a Marine Licence condition.	P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				accidental spills, address all potential contaminant releases and include key emergency contact details	guidelines, double skinning of pipes and takes containing hazardous substances, and storage of these substances in impenetrable bunds. All vessels will be required to comply with the standards set out in the International Convention for the Prevention of Pollution from Ships (MARPOL).													
MM8	x	x	x	Actions to minimise INNS, including a biosecurity plan to limit spread and introduction of INNS.	These measures will aim to manage and reduce the risk of potential introduction and spread of INNS so far as reasonably practicable to best protect the biological integrity of the local natural environment and communities.	Provides a means to ensure the efficient management and communication of commitments made for the management of the potential environmental impacts with respect to the potential introduction and spread of INNS.			x								Secured within a Marine Licence condition.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
MM10	x			Development of, and adherence, to a Construction Method Statement (CMS).	This measure will confirm the actual methodology that will be employed to construct the Proposed Development, provide details on aspects of the methodology not known at the application stage and confirm that the methodology falls within the parameters assessment in the ES.	Provided as a means of controlling specific health and safety risks that have been identified and to secure the health and safety aspects of the development are secured.			x									Secured within a Marine Licence condition.	T
MM12	x	x	x	Development of, and adherence to, an EMP, which will be issued to all vessel operators, requiring them to not deliberately approach marine mammals, marine turtles, and basking sharks; keep vessel speed to a minimum; and avoid abrupt changes in course or speed should marine mammals	To minimise the potential for collision risk, or potential injury to, marine mammals and megafauna this code of conduct outlines in the EMP will be adhered to at all times.				x			x					An EMP will be issued to all Project vessel operators. Proposed to be secured through a condition in the marine licence(s).	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				approach the vessel to bow-ride.														
MM16	x	x		Where practicable, any requirements for cable protection will be compliant with Maritime and Coastguard Agency (MCA)'s methodology (Annex 1 of Marine Guidance Note (MGN) 654) (MCA, 2021).	Following further survey and detailed engineering, if areas are identified where external protection is required and the MCA condition of no more than 5% reduction in water depth is not achievable, a location specific review of impacts to shipping and consultation with the MCA will be carried out and additional mitigations agreed as required.	Ensures the final array layout is suitable for Search and Rescue (SAR) operations and that reductions in under keel clearance are acceptable.						x							T
MM17	x	x	x	The Applicant is committed to marking and lighting the project in accordance with relevant industry guidance and as advised by relevant stakeholders	The new Carbon Capture Storage (CCS) platform will exhibit lights, marks, sounds, signals and other aids to navigation as required by the Standard Marking	Maximises awareness of the Proposed Development in both day and night conditions including in restricted visibility and assists with SAR operations.						x				x		Secured within a Marine Licence condition.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				including the MCA, Civil Aviation Authority (CAA) and Trinity House. This will include appropriate lighting and marking of Offshore Platforms (OPs). The Applicant will also ensure the project is adequately marked on nautical charts. A lighting and marking plan will be secured.	Schedule, and in consultation with Trinity House. The platform and cables will be suitably marked on Admiralty Charts, with associated note.	Measure will ensure other marine users are aware of operations and infrastructure associated with the Proposed Development.													
MM18	x	x	x	Lighting and marking of project vessels.	Cable Lay Vessels (CLVs) and other vessels involved in cable installation will display appropriate marks and lights, and broadcast their status on AIS at all times, to indicate the nature of the work in progress, and highlight their restricted manoeuvrability.	Maximises awareness of the Proposed Development allowing vessels to passage plan in advance.						x					Secured within a Marine Licence condition.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
MM19	x	x	x	Promulgation of information advising on the nature, timing and location of activities, Safety Zones and advisory safe passing distances, including through Notices to Mariners.	Timely circulation of information via Notices to Mariners (NtM), Kingfisher/KIS-ORCA notifications, Radio Navigational Warnings, Navigational Telex (NAVTEX), and/or other navigational broadcast warnings as soon as reasonably practicable in advance of and during the works.	To ensure other marine users are aware of operations associated with the Proposed Development.						x	x		x		Secured within a Marine Licence condition.	T
MM20	x	x	x	Advisory safe passing distances and safety zones.	Passing vessels will be requested to maintain an advisory safe passing distance around project vessels (e.g. cable installation vessels) restricted in manoeuvrability. It is assumed that a 500 m Safety Zone for the new Douglas CCS	To minimise the likelihood of involvement in incidents.						x					Secured within a Marine Licence condition.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
					platform will be applied for post-consent.													
MM21	x	x	x	A Vessel Management Plan (VMP) will be developed which will determine vessel routing to and from construction areas and ports to avoid areas of high risk to marine mammals.	The VMP will be issued to all vessel operators, requiring them to: • not deliberately approach marine mammals, marine turtles, and basking sharks; • keep vessel speed to a minimum; and • avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride.	Ensures project vessels are suitably managed to minimise the likelihood of involvement in incidents and maximise the ability to assist in the event of a third-party incident.			x			x					Secured in the VMP	T
MM22	x	x	x	Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably the International Regulations for	Compliance of project vessels with international marine regulations as adopted by the Flag State, including the COLREGs (International Maritime Organization (IMO),	To minimise the risk introduced due to the presence of project vessels.						x						T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				Preventing Collisions at Sea (COLREGs) (IMO, 1972/78) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974).	1972/77) and SOLAS (IMO, 1974).													
MM23	x	x	x	Where required, based on risk assessment, guard vessels and/or temporary Aids to Navigation (AtoNs) may be deployed to guide vessels around any areas of construction activity.	Where cable exposures exist that would result in significant risk (e.g. if cable burial is carried out post cable lay), guard vessels will be used where appropriate until the risk has been mitigated by burial and/or other protection methods.	To maximise awareness of temporary hazards.						x						T
MM24	x	x	x	Use of guard vessels at cable exposures	Where cable exposures exist that would result in significant risk (e.g. if cable burial is carried out post cable lay), guard vessels will be used where appropriate until the risk has been													

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
					mitigated by burial and/or other protection methods.													
MM25	x		x	Liaison with local ports and harbours, particularly the Port of Mostyn, during the construction phase.	Maximises awareness of the Proposed Development through consultation and ensures project vessels are suitably managed.	Minimises the risk introduced due to the presence of project vessels.						x						T
MM26	x	x	x	Ongoing liaison with fishing fleets will be maintained via an appointed Fisheries Liaison Officer (FLO) and Fishing Industry Representative (FIR). Prior to construction, a Fisheries Liaison and Coexistence Plan (FLCP) will be developed, setting out in detail the planned approach to fisheries liaison and means of delivering any other relevant mitigation measures.	To maintain effective communications between the project and fishermen and appropriate liaison with relevant fishing interests to ensure that they are fully informed of development planning and any offshore activities and works. To provide warnings to the fishing community and advance warning of project activities and associated Safety Zones	The Applicant is committed to ongoing liaison with fishermen throughout all stages of the project. To provide a point of contact to liaise and engage with the fishing industry						x	x					P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
					and advisory safety distances.													
MM27	x	x	x	A dropped objects plan will be developed for reporting and recovery of dropped objects where they pose a potential hazard to other marine users.	For the reporting and recovery of dropped objects.	Dropped objects could pose a potential hazard to other marine users.							X				To be secured within a Marine Licence condition	P
MM28	x	x	x	The identification and implementation of Archaeological Exclusion Zones (AEZs) around those sites identified as having high and medium archaeological potential as identified in Table 11.14 of volume 2, chapter 11.	AEZs will ensure offshore infrastructure avoids any known wrecks. The size of the AEZ will be evidence based and established using the precautionary principle to ensure that it is of sufficient size to protect the site from the nature of impact.	To avoid direct impacts on sites of identified archaeological significance.	Outline Written Scheme of Investigation (WSI)							x			To be secured within a Marine Licence condition	P
MM29	x			Final cable routing, well drilling and platform construction to avoid any known archaeological		To avoid direct impacts on sites of identified archaeological significance.	Outline WSI							x			To be secured within a Marine Licence condition	P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				constraints identified in pre-construction site investigation surveys through micro siting.														
MM30	x	x		The identification and implementation of Temporary Archaeological Exclusion Zones (TAEZs) based on all available information including the stated positional accuracy, the recorded size of the target and the potential archaeological significance around those records for wrecks, obstructions, debris and other sites of archaeological potential outside of the survey data coverage but within the Project boundary.	TAEZs are recommended in Table 11.15 of volume 2, chapter 11. Further details provided in the Outline WSI.	To avoid direct impacts on sites of identified archaeological significance.	Outline WSI							x			To be secured within a Marine Licence condition	P
MM31	x			Archaeological input into specifications for, and archaeological	To identify any sites of archaeological importance that may	To offset the impacts of the Project on sediments of geoarchaeological /	WSI and Protocol for							x			To be secured within a Marine Licence condition	P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				analysis of, any further pre-construction geophysical and geotechnical surveys.	require further investigation, avoidance or engagement with the archaeological curators.	palaeoenvironmental importance and enhance knowledge of the offshore marine archaeological resource.	Archaeological Discoveries (PAD)											
MM32	x			Project archaeologists to be consulted in the preparation of any pre-construction Remotely Operated Vehicle (ROV)/diver surveys and, if appropriate, in monitoring/ checking of data. Further details provided in the Outline WSI.	To identify any sites of archaeological importance that may require further investigation, avoidance or engagement with the archaeological curators.	To prevent damage occurring to unidentified archaeological finds. To record archaeological remains that may be affected by pre-construction clearance operation.	WSI and PAD							x			To be secured within a Marine Licence condition.	P
MM33	x	x		Operational awareness of the location of those archaeological anomalies identified as having a low potential. Reporting through the agreed protocol (PAD) will be undertaken should material of potential archaeological	To identify any sites of archaeological importance that may require further investigation, avoidance or engagement with the archaeological curators.		WSI and PAD							x			To be secured within a Marine Licence condition	P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				interest be encountered. Further details provided in the Outline WSI.														
MM34	x	x	x	Implementation of a protocol for recording finds of archaeological interest, following the guidance for the PAD.	To identify any currently unknown sites of archaeological importance that may require further investigation, avoidance or engagement with the archaeological curators.		WSI and PAD							x			To be secured within a Marine Licence condition	P
MM35	x			Archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction operations and, if appropriate, to carry out archaeological monitoring of such work. Further details provided in the Outline WSI.	To record archaeological remains that may be affected by pre-construction clearance operation.		WSI and PAD							X			To be secured within a Marine Licence condition	P

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
MM36	x	x	x	Mitigation of unavoidable direct impacts on known sites of archaeological significance: Options include i) preservation by record; ii) stabilisation; iii) detailed analysis and safeguarding of otherwise comparable sites elsewhere. Options include preservation by record; stabilisation; and detailed analysis and safeguarding of otherwise comparable sites elsewhere.	Further details provided in the Outline WSI.	To mitigate direct impacts on sites of identified archaeological significance.	WSI and PAD							x			To be secured within a Marine Licence condition.	P
MM37	x	x	x	Development and adherence to a WSI and PAD. Commitment to implementation of the Offshore WSI which is submitted with this application, prior to any post-consent works within the Eni	The Outline WSI is submitted alongside the application and contains a method statement for pre-construction surveys and details of monitoring requirements.	To ensure the protection and, if necessary, recording of previously unknown sites/objects of archaeological significance affected by the development.	WSI and PAD							x			To be secured within a Marine Licence condition.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				Development Area and Area of Physical Project Works.														
MM38	x	x		Where the Proposed Development cables/ pipelines will be required to cross an active cable, it is intended that a commercial 'crossing agreement' will be entered into with the cable operator. A crossing agreement based upon the International Cable Protection Committee (ICPC) Recommendation 3-10C 'Telecommunications Cable and Oil Pipeline/Power Cables Crossing Criteria' (ICPC, 2014) will be used for any cable crossings. Where a cable is inactive, the Applicant	This is a formal arrangement that establishes the responsibilities and obligations of both parties and allows operations to be managed safely.	To reduce potential conflict at cable crossing locations. This is a formal arrangement that establishes the responsibilities and obligations of both parties and allows operations to be managed safely.								x		In line with standard industry practice crossing agreements would be negotiated and agreed with operators as required.	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				will consult with the cable operator to ascertain if such a crossing agreement is required.														
MM39	x	x	x	Development of and adherence to a Navigational Safety Plan (NSP). The NSP will describe measures put in place by the Project related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Project activity to other sea users (e.g., via Notice to Mariners).	To ensure other marine users are aware of operations and infrastructure associated with the Proposed Development.										xx		Proposed to be secured within the marine licence.	T
MM40	x	x	x	Consultation with oil and gas operators and other energy infrastructure operators to promote	Licence blocks will be relinquished and acquired by different operators over the	To promote and maximise cooperation between parties and minimise spatial and									x		Secured in the Marine Licence	T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities.	duration of the project life, and oil and gas operations will change according to the project phase. By continued consultation with the oil and gas operators both parties will keep informed of planned activities in order to minimise disruption to either party's operations and to maximise coexistence.	temporal interactions between conflicting activities.													
MM42	x			Installation of infrastructure over or adjacent to existing cables or pipelines will be subject to crossing or proximity agreements between the two parties, prior to the start of the construction phase.	To reduce potential conflict at crossing locations. Cable and pipeline crossing/ proximity agreements will be based on previously referenced guidance from the ICPC and Oil and Gas UK.										x		In line with standard industry practice crossing/proximity agreements would be negotiated and agreed with operators as required.	T
MM45	x	x		During the construction and operational phases	During the construction and operational phase											x		T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
				vessel fuel consumption will be minimised by optimising vessel scheduling, with consideration given to the co-ordination of activities and material delivery. Activities will be limited on the speed of vessels, and fuel used will have a low sulphur component (0.1%). Vessels older than 20 years will not be used.	emissions resultant from fuel consumption by vessel movements will be minimised by ensuring the use of lower sulphur content fuel, providing an efficient and optimised vessel schedule to reduce the number of journeys, and avoiding the use of older vessels.													
MM48	x			Development and adherence to a Waste Management Plan (WMP).	A WMP is required by all Contractors and Subcontractors setting out details of all waste management procedures for their activities, details of expected waste arisings and procedures for waste management. The following aspects are expected to be a				x			x			x			T

Reference	Proposed Development Phase			Mitigation and monitoring commitment	Justification (specific)	Justification (Generic)	Management plan commitment	Topics of Relevance									Means of implementation	Mitigation category (primary (P), secondary (S) or tertiary (T))
	Construction	Operation and maintenance	Decommissioning					Physical processes	Marine Biodiversity	Underwater noise	Offshore ornithology	Shipping and navigation	Commercial fisheries	Marine archaeology	Infrastructure and Other	Climate change		
					minimum requirement for the WMP: • analysis of the waste arisings/material surpluses; • specific waste management objectives for the Proposed Development; • methods proposed for prevention, reuse and recycling of wastes; • material handling procedures; and • proposals for education of workforce and plan dissemination programme.													

APPENDIX C: INVASIVE NON-NATIVE SPECIES MANAGEMENT

Liverpool Bay CCS Ltd

HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

Environmental Statement
Volume 4, appendix T: Invasive Non-Native Species Management Plan

EHE7228B
Liverpool Bay CCS Limited
Final
February 2024
Offshore ES
Invasive Non-Native
Species Management Plan

rpsgroup.com

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
FINAL	Final	RPS	Eni UK Ltd	Eni UK Ltd	February 2024

Prepared by:

RPS

Prepared for:

Liverpool Bay CCS Limited

Glossary

Term	Meaning
INNS	Any non-native animal or plant that can spread causing damage to the environment, the economy and human health.
Non-native Species	The equivalent of 'alien species' (as used by the Convention on Biological Diversity (CBD)) and 'non-indigenous species' (as used by the OSPAR Commission and the UK Marine Strategy); it refers to a species intentionally or unintentionally introduced outside its native range by human actions.
Project	The HyNet Carbon Dioxide Transportation and Storage Project.
Proposed Development	The offshore components of the Project which are subject of this Environmental Statement, as described in Chapter 3: Proposed Development Description.

Acronyms and Initialisations

Acronym/ Initialisation	Description
CBD	Convention on Biological Diversity
CCS	Carbon Capture Storage
CMS	Construction Method Statement
CO_2	Carbon Dioxide
EIA	Environmental Impact Assessment
ES	Environmental Statement
EMP	Environmental Management Plan
HRA	Habitats Regulations Assessment
INNS	Invasive Non-Native Species
INNSMP	Invasive Non-Native Species Management Plan
LAT	Lowest Astronomical Tide
MCAA	Marine and Coastal Access Act
MHWS	Mean High Water Springs
MMMP	Marine Mammals Mitigation Plan
MMV	Monitoring, Measurement and Verification
PDE	Project Design Envelope
PWA	Pipeline Works Authorisation
SAC	Special Area of Conservation
UK	United Kingdom
WFD	Water Framework Directive

Units

Unit	Description
m	Metre (distance)
km	Kilometre (distance)
kV	Kilovolt (electrical potential)

Contents

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1 INVASIVE NON-NATIVE SPECIES MANAGEMENT PLAN

1.1 Introduction

1.1.1 Background

This Invasive Non-Native Species Management Plan (INNSMP) has been prepared by RPS on behalf of Liverpool Bay CCS Ltd (the Applicant) to support the Environmental Statement (ES) for the HyNet Carbon Dioxide Transportation and Storage Project - Offshore (hereinafter referred to as the 'Proposed Development'). This INNSMP considers the installation, operation and maintenance and decommissioning of the Proposed Development within the waters of Liverpool Bay (Figure 1.1).

Several invasive non-native species (INNS), including the high – medium risk American lobster *Homarus americanus*, Chinese mitten crab *Eriocheir sinensis*, the kelp wakame *Undaria pinnatifida*, Japanese skeleton shrimp *Caprella mutica*, wireweed *Sargassum muticum* and Pacific oyster *Crassostrea gigas* have been recorded within Liverpool Bay (Hurst, 2016; Solway Firth Partnership, 2015) although the majority of records were only single or a few individuals found within ports and harbours.

This management plan has been drawn up using the Precautionary Principle to assess the risk of the introduction and spread of INNS associated with the Proposed Development and to present appropriate measures to minimise these risks as much as possible following best guidance (GB INNS, 2023; Cook *et al.,* 2014; Payne *et al*., 2015). Furthermore, the INNSMP addresses a comment made within the Scoping Opinion by The Offshore Petroleum Regulator for Environment and Decommissioning whereby:

'*Section 7.2.7: Potential Mitigation, where it states 'Compliance with available guidance on mitigating the introduction and spread of INNS', we advise that a full Biosecurity Risk Assessment and Invasive Non-Native Species (INNS) Management Plan is completed in relation to all marine operation activities associated with the Project. The risk assessment and management plan should include consideration of all activities, vehicles and equipment used as well as how the risk will be minimised through appropriate mitigation and adherence to best-practice guidance and management measures. The risk assessment should include a review of all the available data in relation to the presence of marine INNS where applicable to the Project, and the potential risks associated with each species identified.'*

1.1.2 Scope

The scope of the INNSMP is for the activities taking place within the Proposed Development seaward of Mean High Water Springs (MHWS). This INNSMP considers the installation, operation and maintenance and decommissioning of the Proposed Development within the waters of Liverpool Bay (Figure 1.1).

1.1.3 Purpose

This document provides an outline INNSMP aimed at providing an overview of the aspects that will form the basis of the INNSMP. The INNSMP will be further developed post-application in advance of the construction phase of the Proposed Development.

The purpose of the INNSMP is to set out the approach to INNS management and mitigation in respect of the Proposed Development. The management plan will provide an outline of the measures proposed to be implemented to facilitate biosecurity control and to minimise potential impacts on the local and wider environment.

The INNSMP will ensure all procedures pertaining to marine works (including construction, operation and maintenance and decommissioning of subsea structures) and vessel operations follow best practice guidance,

preventing and reducing the risk of the possible spread or introduction of INNS into the waters of the Proposed Development.

The method employed follows the principles of the 'Great Britain (GB) INNS Strategy' (GB NNSS, 2023). The INNS Strategy follows a hierarchical approach which emphasises prevention, followed by early detection and rapid response, and finally long-term management and control. The key outcomes of the GB INNS Strategy are that by 2030 it will have achieved:

- **Prevention:** reduce establishments of INNS by at least 50% compared to 2000 levels.
- **Surveillance, early detection and monitoring:** significantly improve our detection and monitoring capability, including increasing inspections and investigations.
- **Management:** eradicate, control or contain INNS – prioritised by greatest impact and the likelihood of success.
- **Prioritisation and risk analysis:** set out an agreed approach to the prioritisation of species based on risk and likelihood of success to ensure our efforts are focused on where they can achieve the greatest benefit.
- **Evidence:** commission the research priorities outlined in the Evidence Strategic Plan, to ensure that the strategy is based on the best available evidence and identify gaps and priority areas for further development.
- **Awareness raising:** increase awareness of INNS issues and promote appropriate changes in behaviour or attitudes throughout all relevant sectors and among the general public.
- **Coordination:** improve coordination of actions within governments, government-associated bodies, and key actors outside government.

This INNSMP will be finalised prior to construction and will remain a 'live' document throughout the lifetime of the Proposed Development, with periodic updates by the Applicant during the construction, operational and maintenance, and decommissioning phase, as outlined within Section 1.4.7 (Evaluation and Review).

1.1.4 Document structure

The INNSMP is structured as follows:

- Section 1.2: Project Description;
- Section 3: Legislative Context and Consenting Process
- Section 4: Invasive Non-Native Species Management Plan Methodology; and
- Section 5: Invasive Non-Native Species Management Plan.

1.2 Project Description

This section provides the project characteristics, policies and consents relevant to the Proposed Development for the management of INNS, and how this INNSMP links with other management plans.

1.2.1 Proposed Development location

The Proposed Development is located in the Irish Sea, within Liverpool Bay, approximately 12 km to the north of the Welsh coastline and 2 km west of the English coastline. It covers an area of approximately 576.82 km^2. The application for a marine licence for the Proposed Development is shown as a red line boundary which encompasses all the planned and modified infrastructure (Figure 1.1). This includes the pipeline and cables corridor (up to Mean High Water Springs (MHWS)). The pipeline and cables corridor shore approach are located to the north of Talacre in Flintshire, Wales based at the mouth of the Dee Estuary (Figure 1.1).

1.2.2 Proposed Development characteristics

The key offshore infrastructure of the Proposed Development will include both new and repurposed existing infrastructure. The new and re-purposed infrastructure will be located within the Proposed Development (Figure 1.1).

The key offshore infrastructure of the Proposed Development will include:

- New Infrastructure:
  - Installation of a new Douglas CCS platform to replace the existing Douglas Process platform to receive CO_2 from the onshore Point of Ayr (PoA) Terminal and distribute CO_2 to the Hamilton Main, Hamilton North, and Lennox wellhead platforms and when necessary, provide heating to the CO_2 stream. Installation of the new Douglas CCS platform will include up to eight driven piles.
  - Installation of new sections of pipeline to connect the new Douglas CCS platform and the existing subsea natural gas pipelines.
  - Installation of new topsides on the Hamilton Main, Hamilton North, and Lennox wellhead platforms to receive and inject CO_2 into the depleted hydrocarbon reservoirs.
  - Implementation of a programme of Monitoring, Measurement and Verification (MMV) activities - This includes the drilling of two new monitoring wells, one at Hamilton North and one at Hamilton Main.
  - Installation of two submarine 33 kilovolt (kV) power cables, with integrated fibre-optic cable connections (35 kilometres (km) from PoA Terminal onshore to the modified Douglas platform, including within the intertidal/foreshore area up to MHWS, within Welsh waters only).
  - Installation of new submarine 33 kV power cables with integrated fibre-optic connecting the modified Douglas platform with the Hamilton Main (12 km; 33 kV), Hamilton North (15 km; 33 kV) and Lennox (35 km; 33 kV) platforms.
  - Installation of cable and/or pipeline protection, at crossings of existing cables, and in areas where cable burial is not deemed feasible, or as a remedial secondary protection measure if the target cable depth of lowering cannot be achieved.
- Repurposing infrastructure:
  - Repurposing of the existing subsea natural gas pipelines for their change of use from hydrocarbon to CO_2 service.
  - Development of the Hamilton Main, Hamilton North and Lennox reservoirs for CO_2 storage through the drilling and re-completion of injection wells by side-tracking existing production wells. This includes drilling and recompletion operations, all of which will be within the existing footprint (template) of each platform.
  - Implementation of a programme of MMV activities - Additional monitoring wells will be created from the recompletion of existing wells within the existing footprint (template) of each platform: one monitoring well created by side-tracking an existing well in Lennox; and two sentinel wells, one in Hamilton North and one in Lennox.

To facilitate the construction, operation and maintenance, and decommissioning of the Proposed Development, vessels will be used.

For further information on the Project Description, see volume 1, chapter 3 of the ES.

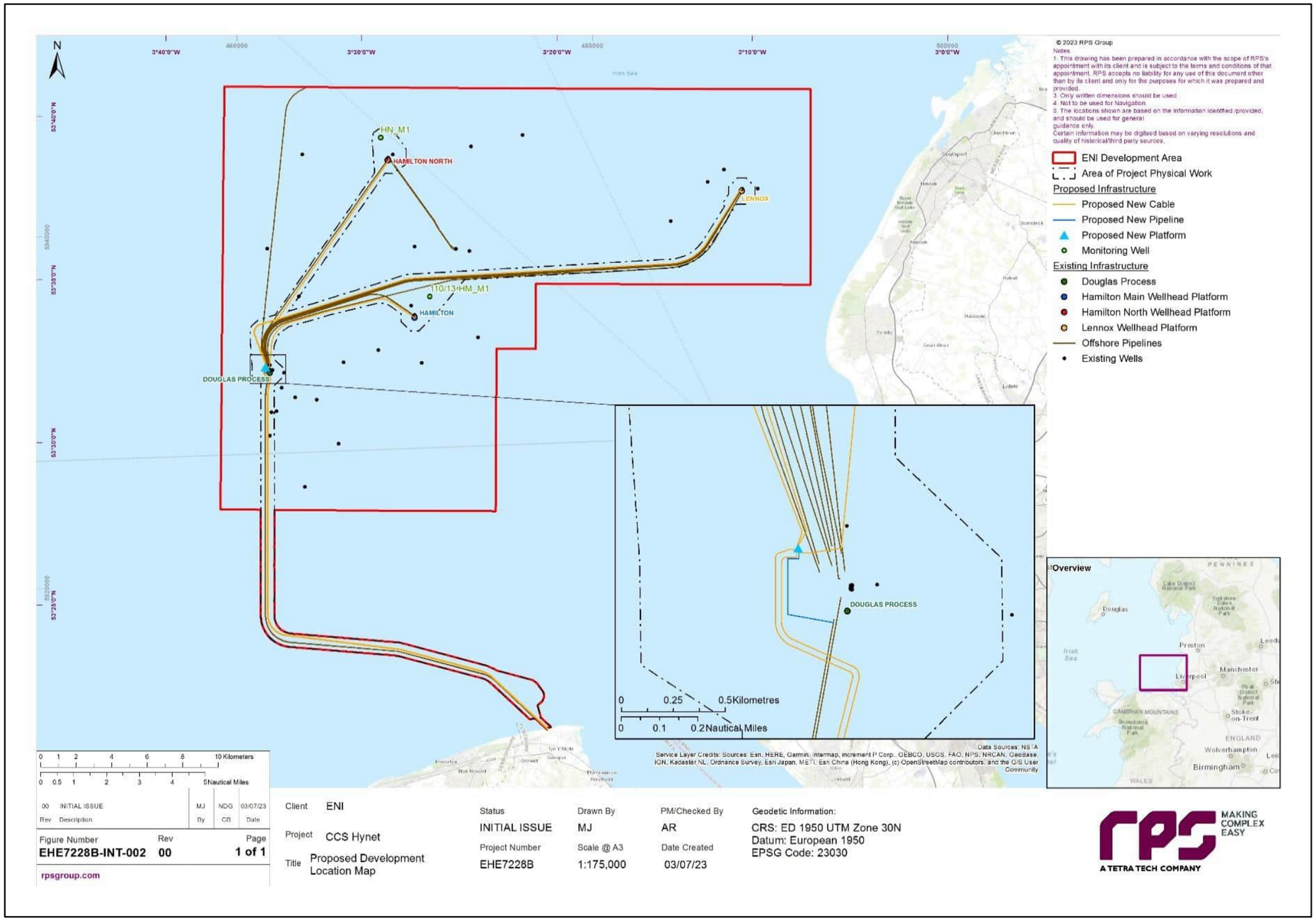

Figure 1.1: Location Overview Of The Proposed Development

1.3 Legislative context and consenting process

1.3.1 Policy

1.3.1.1 International

Convention on Biological Diversity (CBD)

This convention arose from the United Nations Conference on Environment and Development held in Rio in 1992. Within the framework of the convention, there are 15 Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species. These principles provide an international framework for governments and other organisations to develop effective strategies to prevent the introduction, control and eradicate invasive non-native species. Article 8(h) states that each Contracting Party shall prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

Acknowledging the growing threat from INNS, the CBD has provided a major driver for international action. One of its guiding principles calls for national strategies on INNS. In response to this, devolved governments across the UK have produced the 'GB INNS Strategy' (GB NNSS, 2023) as described in Section 1.1.3. This Strategy provides the framework to support the coordination of policy and action across GB and aligns these efforts with national and international biosecurity and environmental strategies.

1.3.1.2 National

EU Regulation (1143/2014) on the prevention and management of the introduction and spread of invasive alien species.

EU Regulation 1143/2014 was retained in domestic law under the European Union (Withdrawal) Act 2018. It was amended through several statutory instruments to ensure operability following the UK's exit from the EU but applies to Great Britain only.

This Regulation sets out rules to prevent, minimise and mitigate the adverse impact on the biodiversity of the introduction and spread within the Union, both intentional and unintentional, of invasive alien species.

The Invasive Alien Species (Enforcement and Permitting) Order 2019

The Invasive Alien Species (Enforcement and Permitting) Order 2019 came into force on 1 December 2019 and pertains to England and Wales. It contains provisions relating to offences, penalties, enforcement, licensing and permitting to meet the requirements of the Regulation.

1.3.2 Consents

This section provides a summary of the consenting process and associated legislative requirements being followed for the Proposed Development.

Table 1.1 sets out the permits and licences pertinent to the Proposed Development and to which the following legislation applies. The applications will be supported by an ES, as well as a Water Framework Directive (WFD) assessment, and a Report to Inform Appropriate Assessment (RIAA).

Should additional pre-construction licences be required, these will be discussed and agreed upon with the relevant consent authority during the pre-construction phase of the Proposed Development.

Table 1.1: Consents Applicable To The Proposed Development

Activity	Permit / Licence / Requirement	Key Legislation
Benthic Ecology Baseline Surveys: – Intertidal Benthic Survey – Subtidal Benthic Survey	• Marine Licence (Band 1) from Natural Resources Wales-Marine Licensing Team (Marine Management Organisation exemption) • OPRED Survey Notification • Crown Estate seabed survey licence	• Marine and Coastal Access Act (MCAA) 2009
Pipeline repurposing / Installation of new pipeline spools to new platform	• Pipeline Works Authorisation updates/renewals for the repurposed pipeline • Marine Licence Band 3	• The Pipeline Safety Regulations 1996 • The Offshore Chemicals Regulations 2002 (as amended) • MCAA
New Platform Installation	• Marine Licence Band 3 • Consent to Locate for fixed installation	• MCAA 2009 • Energy Act 2008
Drilling	• Master Application Templates and Subsidiary Application Templates for new wells, side-track drilling and well intervention	• Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020 • The Offshore Chemicals Regulations 2002 (as amended) • Part 4A of The Energy Act 2008 (as amended) • The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (as amended) • Consent for a Marine Geological Survey or Investigation under The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended)
Environmental Impact Assessment	• Scoping • ES Production • Screening and appropriate assessment • WFD assessment • Submission and Public Notice	• The Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020; • The Offshore Environmental Impact Assessment (The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)); • Habitat Regulations Assessment (Conservation of Habitats and Species Regulations 2017 (as amended); Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)); • EU (Withdrawal) Act 2018 • The Habitats and Birds Directive • Water Framework Directive;
Carbon Storage	• Carbon Dioxide Appraisal and Storage Licence already awarded by Oil and Gas Authority (now North Sea Transition Authority) • Crown Estate Lease • Carbon Storage Permit	• Energy Act 2008

Activity	Permit / Licence / Requirement	Key Legislation
Cable Laying and associated activities	• Marine Licence Band 3 in Welsh Waters • Pipeline Works Authorisation for inter-platform cables in English Waters	• MCAA 2009 • The Pipeline Safety Regulations 1996 • The Offshore Chemicals Regulations 2002 (as amended)

1.3.3 Linkages with other consents management plans

The INNSMP is consistent as far as possible with other relevant consent management plans prepared to inform the implementation of the Proposed Development. Additionally, management plans will be added as and when available. These are set out in Table 1.2 below with details of the linkages presented.

Table 1.2: Linkages With Other Consent Management Plans

Consents Management Plan	Linkage with the INNSMP
Environmental Management Plan (EMP)	The EMP provides the overarching framework for environmental management during the construction, operational and maintenance, and decommissioning phases of the Proposed Development. This can include proposed monitoring, methodologies and timings, along with a range of management plans including stakeholder engagement, traffic, waste, emergency response, invasive non-native species management and decommissioning and restoration.

1.4 Invasive Non-native Species Management Plan Methodology

This section outlines the process of creating an INNSMP using the best available evidence and following best practice guidance (Cook *et al.,* 2014, Payne *et al*., 2015). To make an accurate risk assessment of the Proposed Development, and derive a suitable INNSMP, a stepwise approach was taken as outlined in Figure 1.2 and described in detail below.

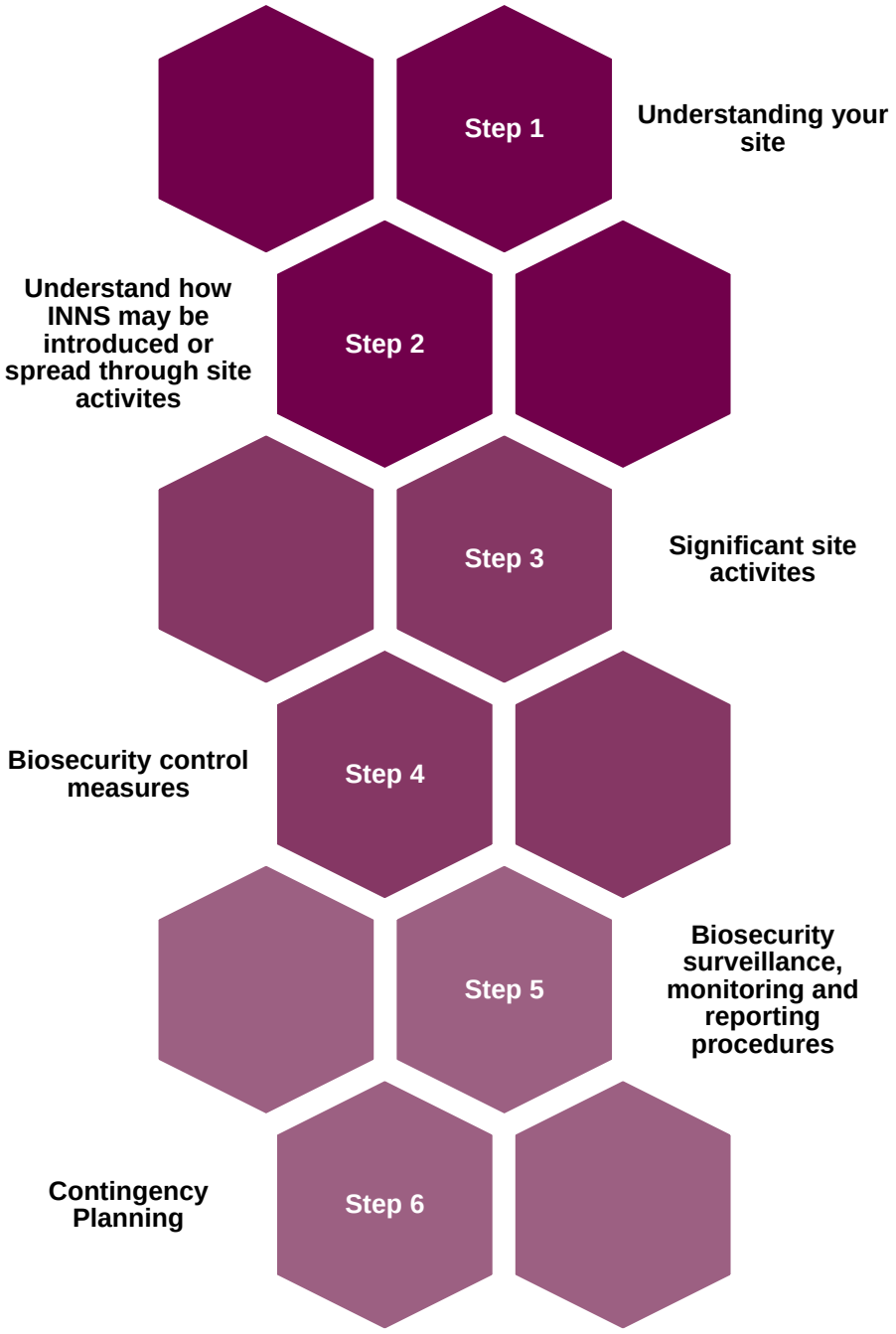

Figure 1.2: Six Steps Used To Produce The INNSMP For The Proposed Development

1.4.1 Step 1: Understanding your site

The first step in creating an INNSMP is to provide a detailed description of the site. This information should include the environmental conditions of the site, such as salinity, depth and the availability of hard substrate (Zaiko, 2007), details of any man-made structures, and if INNS are present within the site.

Understanding the salinity of the site will determine if INNS are present. The majority of marine flora and fauna are unable to tolerate freshwater due to osmoregulatory effects leading to death (Evans, 1980). An increased volume of freshwater flowing into a site will likely result in less hospitable conditions, decreasing the risk of INNS on-site; conversely, a fully marine site tends to represent a greater risk of INNS introduction to communities of native species (Tang *et al*., 2022).

The depth profile of a site can influence the ability of a species to colonise a site. Species live within an ecological range of tolerances, should a site be too deep for a species to live there, then it won't establish. Equally, within shallow environments, periods of tidal inundation and air exposure may decrease the likeliness of a species to establish.

The establishment of a species can also be influenced by the presence of a suitable hard substrate, for more sessile-encrusting organisms (Zaiko, 2007). Should a site only have gravel or sand present, then the likeliness of an INNS that requires a hard substrate to establish is reduced. Therefore, the presence of artificial structures increases the risk of INNS establishment, even if the structure has only been present for just a few weeks as INNS are quick to establish populations (Bax *et al*., 2003). Information related to any slow or stationary periods of work or climatic conditions that may increase biosecurity risk should be included.

If INNS have been found on-site, then the INNSMP should focus on reducing the risk of introducing new INNS and consider how to prevent the spread of existing INNS to other sites. Throughout the whole process, the precautionary principle should be followed, even if no INNS are present on site.

Using this information, a site can be assessed as having a low or significant risk of introducing or spreading INNS. Table 1.3 provides an example of this.

Table 1.3: Example Of Low And Significant-Risk Sites (Payne *et al*., 2015)

Low-Risk Site	Significant Risk Site
• Supply of fresh water from a local river. • Isolated from surrounding environments by walls or breakwaters (i.e. closed or semi-enclosed areas with little to no flow of water). • Anti-fouling is used on artificial structures with periodic removal for air drying.	• Full salinity with no freshwater inflow. • Artificial structures have no antifouling coating with no management in place for maintenance. • The site has connectivity to similar environments.

1.4.2 Step 2: Understand how INNS may be introduced or spread through site activities

In addition to understanding the site, consideration of pathways by which INNS may be introduced or spread is needed. This step should be iterative and revisited when the INNSMP is due for review. The questions and associated risks included in Table 1.4 have been adapted from Payne *et al*. (2015) and provide the type of questions to consider when creating an INNSMP.

Table 1.4: Example Of Questions And Risks To Consider Whilst Creating An INNSMP (Payne *et al*., 2015)

Question	Yes = High	Yes = Medium	Yes = Low
1. Has the vessel/ equipment just arrived from the local area?			
2. Has the vessel/ equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or the time recommended by the manufacturer)?			
3. Are all the visible submerged surfaces of vessels or equipment to be deployed free of biofouling (a green 'slime' is OK)?			
4. Do the visible submerged surfaces of vessels or equipment to be deployed have more than a green 'slime' coating?			
5. Does the vessel or equipment to be deployed have noticeable clumps of algae and/ or animals clinging to the visible parts?			
6. Has the vessel/ equipment just arrived from another country or region with similar environmental conditions (e.g. seawater temperature)?			
7. Has the vessel/ equipment just arrived from a water body known to have INNS present?			
8. Does the vessel/ equipment spend long periods of time stationary at sites in between anti-fouling treatments?			
9. Is the vessel 'slow moving', such as a construction barge or drilling rig?			

For example, a recreational vessel showing no signs of biofouling on the hull or below the waterline would be considered a low risk for introduction of INNS; conversely, a work vessel/barge that moves from site to site and is present on site for long periods may have a medium–high risk, and therefore a significant risk of introducing INNS to site. For this step, information on the vessels and equipment to be used will be obtained from the Project Description, see volume 1, chapter 3 of the ES. A condition assessment of all vessel/equipment to be used will be performed based on the questions in table 3.2. Any results from this assessment that fall within the 'Low' category will be assessed as 'Low' Risk. Any results that fall within the 'Medium' or 'High' category will be assessed as a 'Significant' Risk. This is considered to present a conservative approach to assessing the risk of introducing INNS.

1.4.3 Step 3: Identify significant site activities

The outputs from Step 2 will be used to compile a list of all the significant risks of introducing INNS as a result of the Proposed Development. This will include all vessels and equipment and the associated activities which have been assessed as being of significant risk of introducing INNS and their associated activities within the different phases of the Proposed development. Once this list has been created, the next step is to develop relevant and proportionate control measures.

1.4.4 Step 4: Biosecurity control measures

The outcomes of Steps 1 – 3 will be used to guide the biosecurity measures which should be implemented. Measures to control the introduction or spread of INNS must be effective, clear, realistic and easy to communicate to others. These measures must also consider how much control is enforceable over the site. A list of example control measures can be found within Cook *et al*. (2014), and Payne *et al*. (2015), many of which are included in the INNSMP (see section 1.5.4). Where possible, biosecurity measures should be included in the in-design stage of a new development and aim to 'design out' any possible significant risk of introducing or spreading INNS.

1.4.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

This step will outline what procedures should be followed in the event of discovering and positively identifying an INNS on-site. All staff and other site users should be encouraged to report any unusual sightings to the biosecurity officer.

1.4.6 Step 6: Contingency plan

In the event of the failure of the 'prevention', 'early detection' and 'rapid response' methods to effectively manage INNS introduction (section 1.5.6), a contingency plan will be created. This document should be short, provide a step-by-step approach to action and be accessible to all staff. This plan will review the identified listed activities, identify potential biosecurity control failures and recommend actions for effective management. For example, if a vessel had been wrongly assessed as low risk and introduced an INNS to the site, the introduced species would be sampled and identified, with the relevant authorities notified, followed by further containment and management measures being sought.

1.4.7 Evaluation and review

Following completion of the INNSMP, a clear recording system and review cycle date will be put in place to refine and update the INNSMP as required in line with relevant regulations and legislation.

1.5 Invasive Non-Native Species Management Plan

1.5.1 Step 1: Understanding your site

1.5.1.1 Site description

The Proposed Development is located in Liverpool Bay in the Irish Sea, covering an area of about 576.82 km^2. It is positioned 12 km north of the Welsh coast and 2 km west of the English coast. The marine licence application area for the Proposed Development is shown as a red line boundary which encompasses all the planned and modified infrastructure including the pipeline and cables corridor up to MHWS, near the mouth of the Dee Estuary. The cable and pipeline make landfall within the Dee Estuary SAC. For further information see Section 1.2.1.

1.5.1.2 Environmental conditions affecting biosecurity

Liverpool Bay is a region of freshwater influence with strong horizontal density gradients. The bay is also strongly tidally dominated, with a high tidal range and extensive intertidal areas. Freshwater enters Liverpool Bay from several rivers, including the Mersey, Dee, Ribble, Conwy and Clwyd, which collectively maintain a strong salinity gradient and freshwater plumes (Bricheno *et al.* 2014; Polton *et al.*, 2011; Howarth and Palmer, 2011).

The Proposed Development is located in water depths that range from 0.72 m Lowest Astronomical Tide (LAT) to 35 m LAT, with average water depths across the development area being approximately 20 m LAT. Shallower water is generally present towards the southern and eastern boundaries of the Proposed Development, including the pipeline and cables, situated in inshore waters.

Tidal currents in the area are relatively weak, with spring tides indicating a current flow speed of up to 1m/s, flooding to the east, and ebbing to the west, at a current flow speed of circa 0.8 m/s, as determined through the desktop study for volume 2, chapter 6 of the ES.

The 2019 EUSea Map datasets, describe the Proposed Development area as being composed predominantly of EMODnet seabed substrate folk classification 311 gravelly Sand, 212 (gravelly) Sand, and 211 Sand (EMODnet, 2019). Fine and sandy sediments are dominant in inshore waters and particle sizes range from

260 to 420 µm in areas with stronger currents and from 190 to 250 µm in areas with contrasting, weaker currents (Eni, 2019). This has been corroborated through volume 2, chapter 6 of the ES.

Overall, the influx of freshwater into Liverpool Bay and through the Proposed Development is likely to reduce the presence of INNS. Furthermore, tidal currents and a higher proportion of sand fractions, with no rock, found throughout the Proposed Development are likely to reduce the likeliness of INNS being present within the area. Therefore, the environmental conditions of the site can be assessed as **Low-Risk.**

1.5.1.3 Man-made structures

Section 1.2.2 listed the existing hard structures present within the Proposed Development area. These hard structures include the platforms, injection, monitoring and sentinel wells and pipelines. It is important to note that some of these structures may be buried, such as the power and fibre optic cables and pipelines. Furthermore, Gwynt y Mor offshore wind farm is located within the south-western most corner of the Proposed Development. These structures are likely to increase the potential for INNS to establish. Therefore, the presence of man-made structures are likely to increase the risk of INNS to the site and is assessed as a **Significant-Risk**.

1.5.1.4 INNS within the Proposed Development

The Proposed Development is located within the Dee Estuary Special Area of Conservation (SAC), which is primarily tidal rivers, estuaries, mud flats, sand flats and lagoons (including saltwork basins) (81% coverage). The SAC is designated for a range of Annex I habitats including mudflats and sandflats not covered by seawater at low tide, as well as Annex II species, such as sea and river lamprey (*Petromyzon marinus* and *Lampetra fluviatilis*, respectively). The Natura 2000 - Standard Data Form (JNCC, 2015) for the SAC identifies INNS as a high ranked negative impact pressure. However, it should be noted that this pressure is attributed to the terrestrial invasive saltmarsh species, common cord grass *Spartina anglica*. No marine INNS have, as of yet, been identified as a negative pressure on the Dee Estuary SAC.

National Biodiversity Network (NBN) data (2023) indicated no INNS are present within the Proposed Development area. However, within the wider area of the Proposed Development, Liverpool Bay is known to have INNS present within ports and harbours. As the Proposed Development will require the use of vessels during the construction, operational and maintenance, and decommissioning phases, INNS that have been identified within ports and harbours have been listed on a precautionary basis (Table 1.5).

Table 1.5: Non-Native Species Known To Be Present Throughout Liverpool Bay

	Non-native Species[1]	Environmental risk to native Great Britain species[2]
Present throughout Liverpool Bay:	• American lobster *Homarus americanus* • Chinese mitten crab *Eriocheir sinensis* • Wakame *Undaria pinnatifida*	High Risk
	• Slipper limpet *Crepidula fornicata* • Japanese skeleton shrimp *Caprella mutica* • Wireweed *Sargassum muticum* • Pacific oyster *Crassostrea gigas*	Medium Risk
	• Acorn Barnacle *Elminius modestus*	Risk not assessed / available

[1] Sources: Hurst (2016); Solway Firth Partnership (2015); NBN Gateway (2023).

[2] According to assessment by GB Non-Native Species Secretariat (Risk assessment » NNSS (nonnativespecies.org)).

	Non-native Species[1]	Environmental risk to native Great Britain species[2]
	• Bay barnacle *Amphibalanus improvisus* • Bryozoan *Bugulina simplex* • Bryozoan *Bugulina stolonifera* • Carpet sea squirt *Didemnu vexillum* • Colonial sea squirt *Aplidium cf. glabrum* • Compass sea squirt *Asterocarpa humilis* • Chain Tunicate *Botrylloides violaceus* • Darwin's barnacle *Austrominius modestus* • Devil's tongue weed *Grateloupia turuturu* • Green sea fingers *Codium fragile fragile* • Polychaete *Goniadella gracilis* • Orange-striped anemone *Diadumene lineata* • Orange-tipped sea squirt *Corella eumyota* • Red ribbon bryozoan *Watersipora subatra* • Tufty buff byozoan *Tricellaria inopinata* • Trumpet tubeworm *Ficopotamus enigmaticus* • Leathery sea squirt *Styela clava*	

A species account has been provided for those with a high to medium risk:

- High Risk:
  - American Lobster: A large crustacean from the north-west Atlantic. Slightly larger than (but very similar to) the native lobster (GB NNSS, 2015). The species has been recorded in Solway, at Workington (Solway Firth Partnership, 2015).
  - Chinese mitten crab: The Chinese mitten crab measures up to 56 mm in carapace length. Its carapace has a square outline, tapering towards the front, and features four teeth on each side. The most prominent characteristic of this crab is the thick layer of hair covering its claws and legs. The species have been found to be distributed within the River Dee, Mersey, Ribble and at the mouth of the River Duddon (NBN Gateway, 2023).
  - Wakame*:* A large species of kelp native to Japan, which has a broad frond with fingered edges and a conspicuous midrib. The holdfast is compact and root-like, and the stipe above it bears many folded reproductive frills. Grows on hard substrates from low intertidal to approximately 18 m, tolerant of salinities as low as 20 (GB NNSS, 2019a). The species has been recorded in Liverpool Bay and is currently contained within Fleetwood Marina, located near Blackpool, however, it has increased in abundance in recent years (Hurst, 2016).
- Medium Risk:
  - Slipper Limpet: Shell is oval and up to 5 cm in length. The large shell opening has a shelf, extending half its length. Shell is smooth and white, cream, yellow or pinkish in colour with streaks or blotches of red or brown. The species is now distributed in Europe from Norway to the Mediterranean, with population explosions on the south and south-west England. Within Liverpool Bay, the species has been recorded along the north-west of Wales around Anglesey and at the mouth of the River Mersey (NBN Gateway, 2023).

- Japanese skeleton shrimp: An aggressive skeleton shrimp originally from northeast Asia, which is rapidly invading and has established populations in the North Sea, the West coast of Scotland and the Irish Sea (GB NNSS, 2012). The species has been recorded in Loch Ryan and can be found in harbours and marinas amongst fouling growth on boat hulls, ropes and nets where it can clog equipment and nets as well as outcompete native species (Hurst, 2016).
- Wireweed: A highly distinctive large olive-brown seaweed, often over 1m long. Its lateral branches hang like washing from a line when held out of the water. Wireweed competes with native seaweeds and sea grasses through rapid growth, shading and abrasion. It is a nuisance in harbours and shallow waters where it is a hazard to boating due to the entanglement of propellers (GB NNSS, 2019b). The species is distributed widely along the coasts of south and west England, Wales and West Scotland. It was first recorded in Scotland in Loch Ryan in 2004 and has since populated various areas further north up the west coast (Hurst, 2016).
- Pacific oyster: There are extensive beds of naturally recruited Pacific oysters in some southern estuaries of England and sparse settlements are known from the north coast of Wales near Conwy. Mature individuals were first recorded on the Galloway coast at Ravenshall in October 2012, Ross Bay in December 2012 and Balcary Bay in January 2013. A survey published in 2015 confirmed the Solway Firth to be an ideal habitat for the species although densities were low (Solway Firth Partnership, 2015).

Volume 3, Marine Biodiversity Technical Report (RPS Group, 2024) appendix I of the ES highlights the discovery of an INNS, the polychaete worm *Goniadella gracilis*, at the partially decommissioned station GS28 by Hamilton North (Figure 1.1).

The presence of INNS within and near to the Proposed Development area is considered to be of **Significant-Risk**.

Should any further INNS be recorded in the area prior to finalising the plan, these should be highlighted here, identifying the risk that each species represents to the UK's native species. Table 1.6 presents a summary of the results of Step 1.

Table 1.6: Summary Of The Site Risk Of The Introduction And Spread Of INNS

Site factor effecting risk of INNS	Assessment Result	Risk of INNS
Environmental conditions affecting biosecurity	The influx of freshwater into Liverpool Bay, tidal currents and a higher proportion of sand fractions, with no rock, found throughout the Proposed Development are likely to reduce the likeliness of INNS being present within the area. Therefore, the environmental conditions of the site can be assessed as Low-Risk.	Low
Man-made Structures	The presence of existing hard structures within the Proposed Development, as well as the presence of Gwynt y Mor offshore wind farm located within the south-westernmost corner of the Proposed Development are likely to increase the potential for INNS to establish. Therefore, the presence of man-made structures is assessed as a Significant-Risk.	Significant
INNS within the Proposed Development	NBN data (2023) indicated no INNS are present within the Proposed Development area. However, within the wider area of the Proposed Development, Liverpool Bay is known to have INNS present within ports and harbours. Additionally, volume 3, Marine Biodiversity Technical Report (RPS Group, 2024) appendix I of the ES highlights the discovery of an INNS, the polychaete worm *Goniadella gracilis*, at the partially decommissioned station GS28 by Hamilton North within the Proposed Development area. Therefore, the presence of this INNS is considered to be of Significant-Risk.	Significant

Given the results of Step 1 indicate two areas where the risk of INNS is significant, the INNSMP should focus on reducing the risk of further introducing new INNS and consider how to prevent the spread of existing INNS to other sites.

1.5.2 Step 2: Understand how INNS may be introduced or spread through site activities

1.5.2.1 Vessels and equipment to be used in the Proposed Development

Table 1.7 lists the vessels and equipment to be used for the Proposed Development with a 'risk' indicator for the potential to introduce or spread INNS. This risk assessment will be updated once the final project parameters have been confirmed and will be based on professional judgement, the final Proposed Development design, INNS present within the area (see Section 1.5.1), and available guidance.

The ES is based on the Proposed Development design parameters, which include the use of several vessels, planned infrastructure, such as cables and CO_2 injection, sentinel and monitoring wells, and the modification of existing installations (Figure 1.1). Additionally, there may be a requirement to use concrete mattresses and rock armour. These will be refined post-consent, such that the risk can be accurately assessed. As stated previously, this is a 'live' document and as such, if specific details of the Proposed Development undergo review or are changed, this document will be updated accordingly.

The results of Step 2 as presented in Table 4.2 indicate that the use of vessels in all phases of the Proposed Development presents a significant risk for the introduction of INNS. However, operational speeds of the vessels combined with the implementation of standard control measures to comply with relevant regulations such as MARPOL and those to manage ballast water will reduce the risk to low.

Man-made structures also present a significant risk to the introduction of INNS and given the identified presence of an INNS within the Proposed Development. Additional project specific control measures will be required to manage this risk.

Table 1.7: Vessel, Foundation Types, And Substrates To Be Used In The Proposed Development

Name	Type	Details & Risk factors	Risk before control measures: Low/Significant	Assumptions and Standard Control Measures	Risk after control measures: Low/Significant
Vessels (Construction phase)	Various	• Vessel types and sizes to be used in the construction phase for the: – Oil Platform and wells include: Main installation and support vessels, tug/anchor handlers, cargo barges, support vessels, survey vessels, pre-comm vessels, seabed preparation vessels and crew transfer vessels; and – Cables and pipe include: cable lay installation & support, vessels, jack-up, multicat, working boat, support vessel (for trenching), dsv/lcv (for cable pull-in), survey vessel, seabed preparation vessel, crew transfer vessel, cable protection installation vessel and cable burial installation vessel. • Indicative construction port: – Port of Belfast Shipyard, Belfast, N.Ireland, UK (150 nm from the Proposed Development), and – Arnish Point Yard, Isle of Lewis, Scotland, UK (380 nm from the Proposed Development), with the final decision still to be made.	Significant	Vessels will be slow moving during construction and are expected to come from the Port of Belfast, approximately 150 nm from the Proposed Development. Vessels will be required to have an anti-fouling coating, inspection history complying with relevant regulations (MARPOL Regulations) and to manage ballast water. Anti-fouling coating and adherence to the MARPOL regulations and ballast standards will reduce the risk of INNS being present on the hulls of vessels.	Low
Vessels (operation and maintenance)	Various	• Vessel types and sizes to be used in the operation and maintenance phase include a jack-up barge and a multi-purpose support vessel. • The indicative operation and maintenance port is yet to be confirmed.	To be confirmed	Vessels will be required to have an anti-fouling coating and inspection history complying with relevant regulations (MARPOL Regulations).	To be confirmed

Name	Type	Details & Risk factors	Risk before control measures: Low/Significant	Assumptions and Standard Control Measures	Risk after control measures: Low/Significant
Vessels (Decommissioning phase)	Various	• Vessel types and sizes to be used in the decommissioning phase include decommissioning and support vessels, tug/anchor handlers, cargo barges, cable decommissioning and support vessels, survey vessels, and crew transfer vessels. • Indicative decommissioning port: – Port of Belfast Shipyard, Belfast, N.Ireland, UK (150 nm from the Proposed Development), and	Significant	Vessels will be slow moving when removing structures during decommissioning and are expected to come from the Port of Belfast, approximately 150 nm from the Proposed Development. Vessels will be required to have an anti-fouling coating, inspection history complying with relevant regulations (MARPOL Regulations) and to manage ballast water. Anti-fouling coating and adherence to the MARPOL regulations and ballast standards will reduce the risk of INNS being present on the hulls of vessels.	Low
New Infrastructure	• CCS platforms • Topsides	• Infrastructure, pile jacket and topsides will be delivered via heavy lift vessel, crane or transport barge.	Low	The piles will be prefabricated at an onshore facility and delivered offshore by means of a transportation barge and are unlikely to come into contact with the water, (and therefore INNS), until installation.	Low
	• Pipeline	• A 595 m length of the pipeline is to be installed and laid on the seabed. This is likely to be transported via barge.	Low	The pipeline will be delivered offshore by means of a transportation barge and is unlikely to come into contact with the water, (and therefore INNS), until installation.	Low
	• Monitoring Wells	• Monitoring wells are to be drilled.	Low	INNS are unlikely to colonise the drilled wells.	Low
	• Cables	• Cables will be installed from onshore through to the connection point via the installation vessel.	Significant	Cables are to be installed throughout a wide range of environmental conditions and habitats, with vessels likely to have come from ports where INNNS may be present. There is therefore an increased risk of introducing an INNS along the cable.	Low

Name	Type	Details & Risk factors	Risk before control measures: Low/Significant	Assumptions and Standard Control Measures	Risk after control measures: Low/Significant
				However, according to the Project Description cables are expected to be burried thereby mitigating any colonisation of INNS on the cable	
	• Concrete Mattresses/ Other External Cable Protection	• Concrete mattresses and other external cable protection will be installed at crossings of existing cables, and in areas where cable burial is not deemed feasible, or as a remedial secondary protection measure if the target cable depth of lowering cannot be achieved	Low	Concrete mattresses/ other external cable protection are to be delivered to the site via barge and will not come into contact with the water, (and therefore INNS), until installation.	Low
Repurposed infrastructure	• Repurposing of existing pipelines • Redevelopment of reservoirs • Recompletion of monitoring wells	• Existing infrastructure is to be repurposed for the Proposed Development.	Significant	Volume 3, Marine Biodiversity Technical Report (RPS Group, 2024)appendix I of the ES has reported that one specimen, the polychaete worm *Goniadella gracilis* was recorded at the partially decommissioned station GS28.	Significant

1.5.3 Step 3: Significant site activities

Based on the results of Step 2, a list of the Proposed Development activities per phase, that may have a significant risk of introducing or spreading INNS is provided in Table 1.8. The assessment in Step 2 was derived from information provided in the Project Description and will be updated based on the final project design as explained in Step 2 (section 1.5.2), with these activities predicted to represent a significant risk of INNS introduction during the construction, operation and maintenance and decommissioning phases.

Table 1.8: Site Activities Which Have A Significant Risk Of Introducing Or Spreading INNS

Phase	Activity Description
Construction	• Presence of existing man-made structures that may have INNS present.
Operation and Maintenance	• Presence of man-made structures that may have INNS present. • Maintaining man-made structures and ancillary equipment that may have INNS present.
Decommissioning	• Removal of man-made structures and ancillary equipment that may have INNS present. • Cleaning and disposal of biofouling from man-made structures and ancillary equipment.

1.5.4 Step 4: Biosecurity control measures

This section provides information on site-specific risks and control measures associated with the Proposed Development.

1.5.4.1 Presence/maintenance/ removal of existing man-made structures that may have INNS present

Risk

This may pose one of the greatest risks of INNS spreading associated with the Proposed Development. New or clean surfaces, such as vessels and infrastructure are typically the first colonisation sites for INNS due to their ability to settle and rapidly proliferate, replacing native populations (Huxel, 1999). Newly available hard surfaces (e.g. new platforms and auxiliary infrastructure) associated with the Proposed Development may be susceptible to colonisation by INNS found at the partially decommissioned station GS28 (near Hamilton North and Hamilton) in the first few weeks/months after installation (Bax *et al.*, 2003).

Control measures

Any man-made structure to be used for the Proposed Development should be of terrestrial origin (i.e. not coming from another marine environment) and inspected for INNS prior to placement in the marine environment. During maintenance, the structure should be inspected for any INNS present, and if detected, then actions should be followed as presented in Section 1.5.6.

It should be noted that the INNS *Goniadella gracilis* is a species of polychaete worm, these worms are unlikely to adhere themselves to structures but will be inhabiting the surrounding sediments of the station GS28. As the species does not adhere to structures, this is likely to decrease the risk of spreading the INNS to other areas. However, caution should be advised if dredging within the vicinity of GS28 is required.

1.5.4.2 Cleaning and disposal of biofouling from structures during operation and maintenance activities and decommissioning

Risk

During routine operations and maintenance activities (e.g. jet washing of marine growth from the splash zone, or component replacement where required), there is potential for any established INNS to be detached from subsea structures. Where there is an identified risk that these activities may lead to the spread of INNS in the marine environment, additional control measures may be required.

Following the removal of marine structures during the decommissioning phase, INNS, if present, may still be attached to the surface. Should the INNS be removed without due care and washed back into the marine environment surrounding the Proposed Development, these INNS may represent a risk of spreading to areas previously unaffected.

Control measures

Where there is an identified risk that operation and maintenance activities (e.g. periodic cleaning of infrastructures) may lead to the spread of INNS (e.g. if there is a high risk that INNS are present on infrastructure), control measures may be required to minimise the amount of material entering the marine environment.

Large volumes of material detached or removed from decommissioned subsea infrastructure should be prevented from re-entering the marine environment. The material should be taken away and properly disposed of onshore. Control measures taken in relation to the disposal of biofouling will be aligned with the relevant Port Authority 'Waste Management Plan'.

Biosecurity action

Prior to the installation of subsea structures or operation of new vessels to the Proposed Development, the Applicant and their contractors must include the following biosecurity clauses in any contract agreement:

- The contractor must submit a Biosecurity Risk Assessment to the Project Environmental Manager at least six weeks prior to installation/operations; and
- The contractor must ensure that all equipment, materials, machinery, Personal Protection Equipment (PPE) and vessels used are in a clean condition prior to their arrival on-site to minimise the risk of INNS introduction into the marine environment.

1.5.4.3 Additional biosecurity measures

The Proposed Development has been assessed as Significant in Step 1, therefore, using the precautionary approach, additional biosecurity measures have been presented.

1.5.4.4 Using vessels from outside of the Proposed Development

Risk

Using vessels from outside the Liverpool Bay area poses a significant risk of introducing INNS to the area (Minchin and Gollasch, 2010), especially vessels coming from areas of a similar marine environment. Information on the origin of the vessels to be used in all phases of the Proposed Development will be included within the INNSMP once the exact details and origins of vessels are specified following the appointment of construction contractors.

Control measures

All vessels to be used for construction, operation and maintenance and decommissioning activities must follow the guidelines as directed by the 'Guidelines for the Control and Management of Ships' biofouling to minimize the transfer of invasive aquatic species'[3], and where applicable, to comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments'[4].

1.5.5 Step 5: Biosecurity surveillance, monitoring and reporting procedures

Table 1.9 outlines who is responsible for carrying out certain checks of INNS, where these checks are to be carried out and when. Note that these positions are indicative, and roles and responsibilities will be confirmed upon contract award.

Table 1.9: Roles, Responsibilities, And Instructions For Staff, Contractors, And Site Users

Who	What	Where	When
Project Operations & Environment Manager - developers and contractors	• Oversee removal of flora and fauna from infrastructure, concrete mattress etc. and ancillary equipment, ensure material is properly disposed of and that no material is released into the water as per the relevant Port/Harbours 'Waste Management Plan'. • Awareness of INNS, including identification guidance on the key risk species. If uncertainty arises, follow the contingency plan.	At Port	Beginning of works
Project Operations & Environment Manager or appropriate contractor	• Oversee installation and removal of infrastructure, concrete mattress etc. and ancillary equipment, checking for INNS or unknown organisms. • For operations and maintenance, periodic checks should be carried out to ensure no growth/settlement of INNS, when possible. • Be aware of any slow-moving or inactive craft and take steps to assess risk. • Ensure a Check, Clean and Dry message is sent to any new developers or contractors. • Where possible, collaborate with the relevant port/Harbours and other users of Liverpool Bay to raise INNS awareness.	At Port	Beginning of works
Developers and contractors	• Confirm the origin of the material used in infrastructure, concrete mattress etc. and ancillary equipment (i.e. terrestrial origin, not previously submerged in marine water). • Encourage 'toolbox' talks on INNS prevention and monitoring.	N/A	Throughout works
Project Operations & Environment Manager - developers and contractors	• Through collaboration with the Regulators (including relevant stakeholders) will develop measures appropriate to the Proposed Development deployment specific to the site, nature, and duration of activities on a case-by-case basis.	N/A	Beginning of works

[3] For more information, see: Biofouling (imo.org)

[4] For more information, see: Ballast Water Management (imo.org)

1.5.6 Step 6: Contingency plan

Table 1.10: Contingency Plan In The Event Of Failure Of Prevention Of Inns Introduction

Action	Responsibility
Stage One – Suspected arrival of high-alert species	
Take photographs of the sample and collect the sample in a plastic bag.	Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery.
Check the organism against the identification sheet (see ID sheets » NNSS (nonnativespecies.org)) Report to Recording » NNSS (nonnativespecies.org)	Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project), or any member of staff at the site of INNS discovery.
Stage Two – Presence of high-alert species confirmed	
Initiate immediate containment measures, including restricted vessel movements.	Designated biosecurity officer, site manager, Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project).
Carry out a wider survey of vessels and structures.	Designated biosecurity officer, and qualified ecologist.
Stage Three – Eradication/employ long-term control measures	
Seek advice from the GB Non-Native Species Secretariat on appropriate measures and actions for long-term control.	Designated biosecurity officer and Contractor Environmental Manager or Client Environmental Manager (depending on the phase of the project).

1.5.7 Evaluation and review

1.5.7.1 Location of biosecurity logbook

A biosecurity logbook will be kept (in electronic form) for the Proposed Development and will be made available for inspection and review as and when required.

1.5.7.2 Plan review date

This plan will be updated prior to construction to include the final project design and include an updated risk assessment based on that final design. This will include all measures to manage INNS during the construction, phase as agreed with the relevant regulatory authorities.

The plan will be updated following the completion of construction and at the beginning of the operational and maintenance phase to ensure the plan is appropriate for the next phase of the development and the risks and activities associated with it. The plan will be updated at regular intervals during the operational and maintenance phase and prior to the decommissioning phase to ensure all measures are appropriate and any changes in the environment and risk of INNS (e.g. records of INNS being present on site) are reflected in the INNSMP, as agreed with the relevant regulatory authorities.

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APPENDIX D: WRITTEN SCHEME OF INVESTIGATION.

HyNet Carbon Dioxide Transportation and Storage Project: Liverpool Bay

Offshore Written Scheme of Investigation and Protocol for Archaeological Discoveries

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Glossary

Term	Meaning
Effect	The consequence of an impact.
Environmental Impact Assessment	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Impact Assessment (EIA) Report.
Impact	A change that is caused by an action.
Mitigation Measure	Measure which would avoid, reduce, or remediate an impact.
Palaeoenvironmental	An environment of a past geological age.
Project	The HyNet Carbon Dioxide Transportation and Storage Project.

Acronyms

Acronym	Description
AD	Anno Domini
ADS	Archaeological Data Service
AEZ	Archaeological Exclusion Zone
BP	Before Present
CCS	Carbon Capture and Storage
CIfA	Chartered Institute for Archaeologists
CLV	Cable Lay Vessel
COWRIE	Collaborative Offshore Wind Research Into The Environment
CPAT	Clwyd-Powys Archaeological Trust
DAC	Data Archive Centre
ED50	European Datum 1950
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
HE	Historic England
JCCC	Joint Casualty and Compassionate Centre
LAT	Lowest Astronomical Tide
MEDIN	Marine Environment Data and Information Network
MPS	Marine Policy Statement
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MOD	Ministry of Defence
NLO	Named Locations
NRW	Natural Resources Wales

NSC	Non-submarine contact
NSTA	North Sea Transition Authority
OASIS	Online Access to the Index of Investigations
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
PAD	Protocol for Archaeological Discoveries
POA	Point of Ayr
RCAHMW	Royal Commission on the Ancient and Historic Monuments of Wales
ROV	Remotely Operated Vehicle
SCAUM	Standing Conference of Archaeological Unit Managers
SPVA	Service Personnel and Veterans Agency
TAEZ	Temporary Archaeological Exclusion Zone
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
UTM	Universal Transverse Mercator
WIS	Western Irish Sea
WIS-A	Western Irish Sea Formation - A
WWII	World War II
WSI	Written Scheme of Investigation

Units

Units	Description
%	Percentage
km	Kilometres (distance)
km²	Square kilometres (area)
kV	Kilovolt (electrical potential)
m	Metres (distance)
Mt	Million tonnes (weight)
nm	Nautical miles (distance; 1 nm = 1.852 km)

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Appendices

1 Outline Written Scheme of Investigation (WSI)

1.1 Introduction

1.1.1.1 This Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) has been produced to address the specific requirements of the relevant conditions attached to the marine consents issued to the HyNet Carbon Dioxide Transportation and Storage Project (hereafter referred to as "the Project").

1.1.1.2 The purpose of the document is to set out details of the mitigation for the Project, and how this mitigation will be enacted. This includes work which has been recommended within the Project's consent application (Liverpool Bay CCS Ltd, 2024). The PAD and WSI has been prepared by the retained archaeologist to ensure that those involved in the construction and operation of the Project, including Liverpool Bay CCS Ltd personnel and all of the associated contractors, are aware of and understand archaeological mitigation measures, and how and when to apply them.

1.1.1.3 This document is based on the Outline Written Scheme of Investigation and Protocol for Archaeological Discoveries submitted as part of the consent application for the Project (Liverpool Bay CCS Ltd, 2023b). This document has also been produced in line with best practice guidance, in particular, Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects by The Crown Estate (2021). While this guidance was prepared for renewable energy projects, it has wider relevance to other industries and has therefore been referred to here.

1.1.2 Project Consents

1.1.2.1 The Project has received the following relevant marine consents:

- Marine licence (number CML2365) from Natural Resources Wales (NRW) under the Marine and Coastal Access Act 2009.
- Consent (reference number ES/2022/009) from the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) under Regulation 14(5) of the Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020.

1.1.2.2 The relevant consent conditions, along with how they are addressed in this document, are listed in Table 1.1.

Table 1.1 Project consents

Consent	Condition Number or Reference	Text	Where addressed in this document
Marine licence number CML2365	3.24.1	The Licence Holder must submit a Written Scheme of Investigation (WSI) which shall be in accordance with the outline WSI (CML2365-LBA CCS Ltd_OFFSHORE ES_Appendix U WSI_NRW_FINAL) to the Licensing Authority for written approval at least 4 months prior to commencement of the Licensed Activities. No Licensed Activities may be undertaken prior to written approval from the Licensing Authority.	This document is the WSI which will be submitted to the Licensing Authority for written approval prior to commencement of the Licensed Activities. It is in accordance with the outline WSI (Liverpool Bay CCS Ltd, 2023b).
	3.24.2	The Licence Holder must submit a Protocol for Archaeological Discoveries (PAD) to the Licensing Authority for written approval at least 4 months prior to commencement of the Licensed Activities. No Licensed Activities may	The PAD is contained in Appendix A and will be submitted to the Licensing Authority for written approval with this WSI prior to

Consent	Condition Number or Reference	Text	Where addressed in this document
		be undertaken prior to written approval from the Licensing Authority.	commencement of the Licensed Activities.
	3.24.3	The Licence Holder must ensure that any actions outlined in the documents detailed in conditions 3.24.1 and 3.24.2 are implemented as approved in writing by the Licensing Authority. Any proposed changes to the actions outlined in the documents must be submitted to and approved in writing by the Licensing Authority prior to any changes being enacted.	Responsibilities and processes for implementing, reviewing and monitoring compliance with the WSI are set out in Section 1.2.
Regulation 14(5) Consent (ref. ES/2022/009)	Marine Archaeology	Should unrecorded marine archaeology features be identified, mitigation measures (establishment of Archaeological Exclusion Zone (AEZs) and Temporary Archaeological Exclusion Zone (TAEZs)) would be implemented to avoid and mitigate any potential impacts.	The PAD contains the process for reporting unrecorded marine archaeology features (Appendix A). The implementation of AEZs and TAEZs is discussed in Section 1.5.2, along with the procedure for establishing new AEZs and TAEZs.

1.1.3 Location

1.1.3.1 The Project is located in the CS004 CO2 Appraisal and Storage Licence area (NSTA, 2020), approximately 12 km to the north of the Welsh coastline and 2 km west of the English coastline (Figure 1.1). The licence area covers approximately 576.82 km^2 and encompasses the depleted hydrocarbon reservoirs of the Hamilton, Hamilton North, and Lennox fields. The corridor shore approach is located to the north of Talacre in Flintshire, Wales, near the mouth of the Dee Estuary.

1.1.3.2 The area to which this WSI and PAD applies can be broken down into two parts (Figure 1.1):

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

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

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

1.1.3.5 A third area, termed the Marine Archaeology Study Area, was used in the consent application (Liverpool Bay CCS Ltd, 2023a; Liverpool Bay CCS Ltd, 2024). This comprised a 2 km buffer around the Eni Development Area, up to Mean High Water Springs (MHWS) and was defined to better characterise the archaeological resource within the Eni Development Area. The mitigation set out within this document is focused on the Area of Project Physical Work and the Eni Development Area. No direct impacts will occur within the Marine Archaeology Study Area and therefore no mitigation is proposed in that area.

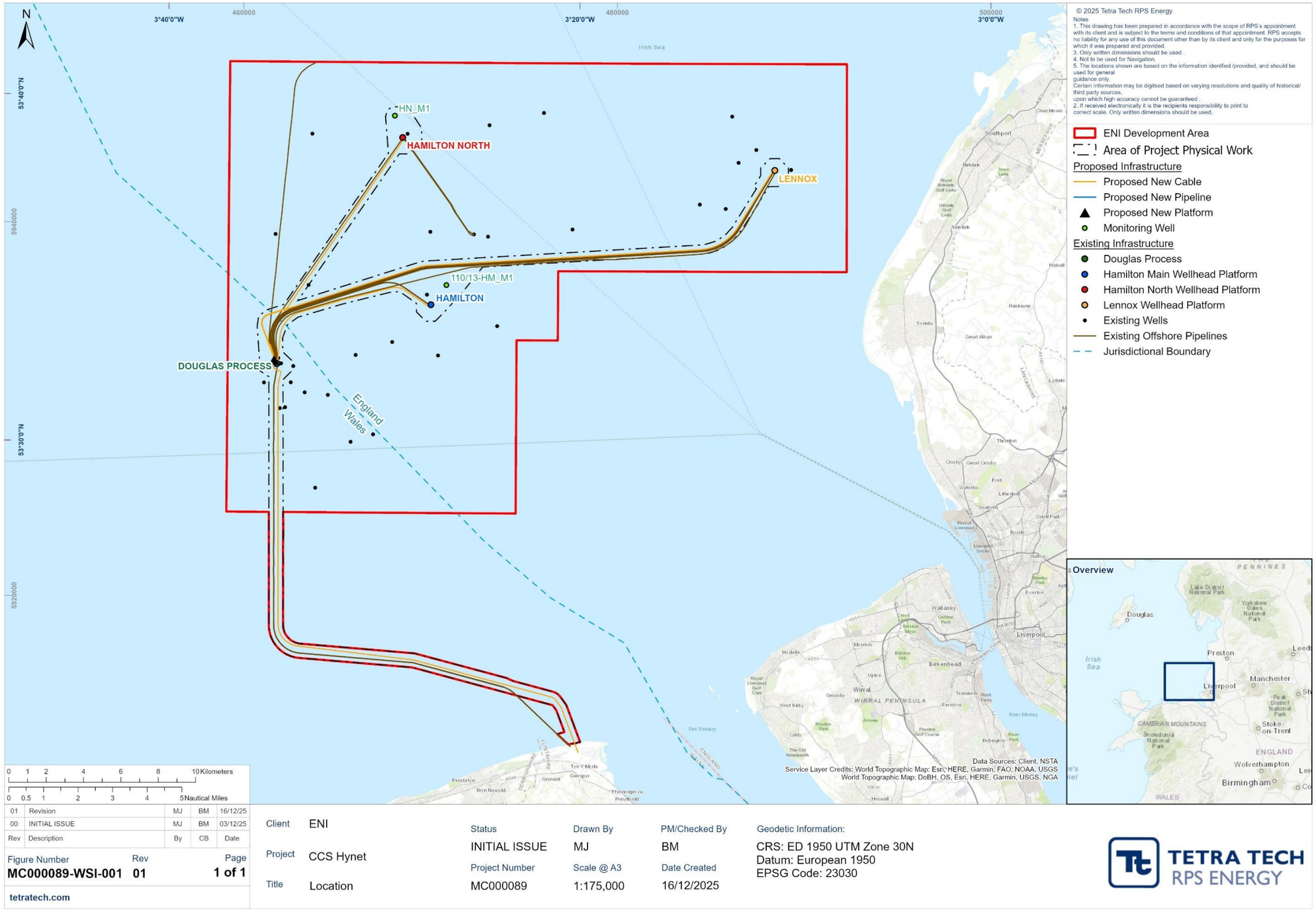

Figure 1.1 Site Location

1.1.4 Project description and licenced activities

1.1.4.1 As part of the offshore components of the Project, the existing offshore natural gas import pipeline from Point of Ayr (PoA) Gas Terminal will be repurposed to become a CO2 export pipeline and will transport the CO2 to the newly constructed Douglas Carbon Capture and Storage (CCS) platform. From the Douglas CCS platform, CO2 will be transported along re-purposed natural gas pipelines to the Hamilton Main platform for injection into the Hamilton Main reservoir, to the Hamilton North platform for injection into the Hamilton North reservoir, and to the Lennox platform for injection into the Lennox reservoir. The Project will also require new electrical and fibre optic transmission infrastructure seawards of MHWS, connecting the PoA Terminal to the offshore infrastructure. The offshore components of the Project will be confined within the Eni Development Area shown in Figure 1.1.

1.1.4.2 The licenced activities (within Welsh waters only) under marine licence CML2365 to which this WSI and PAD relate are:

- Laying, burial and dredging, of two submarine 33 kV armoured power cables with integrated fibre-optic cable connections from PoA Terminal onshore to the new Douglas CCS platform. The landfall connection will be made using Horizontal Directional Drilling (HDD). HDD will be used to pass under the Talacre dunes and exit at the MHWS point, within the beach area;
- Laying, burial and dredging, of three submarine 33 kV armoured power cables with integrated fibre-optic cable connections, one each from the new Douglas CCS platform connecting with the Hamilton Main, Hamilton North, and Lennox platforms;
- Installation of concrete mattresses and external rock protection at crossings of existing cables;
- Installation of new sections of pipeline spools to connect the new Douglas CCS platform to the existing subsea natural gas pipelines;
- Installation of concrete mattresses and external rock protection on sections of pipeline;
- Installation of a new Douglas CCS platform to replace the existing Douglas Process platform to receive CO2 from the onshore PoA Terminal and distribute CO2 to the Hamilton Main, Hamilton North, and Lennox wellhead platforms and when necessary, provide heating to the CO2 stream. Installation of the new Douglas CCS platform will include up to eight driven piles;
- Repurposing of the existing subsea natural gas pipelines for their change of use from hydrocarbon to CO_2 service;
- Clearance of a maximum of 12 items of Unexploded Ordnance (UXO);

1.1.4.3 Additional Project activities subject to the Regulation 14(5) OPRED consent, and therefore to which the PAD has to be implemented, and which may lead to the establishment of further AEZs and TAEZs are:

- installation of new topsides on the Hamilton Main, Hamilton North, and Lennox wellhead platforms;
- drilling and re-completion of injection wells by side-tracking existing production wells;
- drilling of two new monitoring wells, one at Hamilton North and one at Hamilton Main;
- recompletion of existing wells within the existing footprint (template) of each platform:
  - one monitoring well created by side-tracking an existing well in Lennox;
  - two sentinel wells, one in Hamilton North and one in Lennox.
- Presence of the jack-up drilling rigs; and
- Discharges from the drilling of the wells.

1.1.4.4 All other ancillary Project activities not mentioned above should also be undertaken in line with the WSI. This includes the anchoring or positioning of vessels or jack-ups.

1.1.4.5 All mitigation committed to during the application (Liverpool Bay CCS Ltd, 2024; section 1.5) should be applied to all Project activities and locations, whether in Welsh or English waters.

1.1.4.6 The pre-construction and construction phases are currently planned to be phased according to location, with works between PoA Terminal to the new Douglas CCS platform being undertaken in 2026, and works between the new Douglas CCS platform and the Hamilton Main, Hamilton North, and Lennox platforms being undertaken in 2027.

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

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

1.1.4.9 This WSI and PAD may be amended to apply to any future marine licences or consents that may be acquired for the Project.

1.1.5 Aims and objectives

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

- Set out the roles and respective responsibilities of Liverpool Bay CCS Ltd, Contractors, and Retained Archaeologist and Archaeological Contractor(s) and formal lines of communication between the parties and with Archaeological Curator(s) (section 1.2.2).
- Outline the known and potential archaeological receptors that could be impacted by the project (section 1.3).
- Outline the agreed mitigation and archaeological actions that are to take place in various circumstances (section 1.5).
- Set out the importance of research frameworks in setting objectives that are delivered through realisation of the work (section 1.4), provide methodologies for these archaeological actions, to be employed on archaeological work conducted in the post consent period (sections 1.5 and 1.6).

1.1.6 Guidance

1.1.6.1 This document has been produced in line with best practice guidance, including:

- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate, 2021).
- Planning Policy Wales Technical Advice Note 24: The Historic Environment.
- Managing the Marine Historic Environment of Wales (Cadw/Welsh Government, 2020).
- Historic England's (HE) Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008).
- Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Cadw, 2011).
- Code of Conduct (Chartered Institute for Archaeologists (CIfA, 2014 (updated 2022)).
- Standard and Guidance for Historic Environment Desk Based Assessment (CIfA, 2014 (updated 2020)).
- COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007).

- Offshore Renewables Protocol for Archaeological Discoveries (The Crown Estate, 2014).
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011).
- Marine Geophysics Data Acquisition, Processing and Interpretation, Guidance Notes (English Heritage, 2013, currently under review by MSDS Marine for Historic England).
- Identifying and Protecting Palaeolithic Remains (English Heritage, 1998).
- Military Aircraft Crash Sites (English Heritage, 2002).
- Aircraft Crash Sites at Sea (Wessex Archaeology, 2008).
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee, 2006).

1.2 Implementation of the WSI

1.2.1.1 This section sets out the responsibilities of Liverpool Bay CCS Ltd and other relevant parties, and the lines of communication during the pre-construction, construction, operation, maintenance and decommissioning process for the Project with the aim of ensuring that the archaeological mitigation measures described are fully implemented in a timely manner that does not interfere with the smooth running of the Project programme. Contact details of relevant parties are listed in Table 1.2.

Table 1.2 Key contacts

Role	Name	Organisation	Telephone	E-mail
Environmental Coordinator	Alistair Billington	Liverpool Bay CCS Ltd	+44 (0)7554008227	Alistair.Billington@external.eni.com
Environmental Advisor	Lamia Gherbi	Liverpool Bay CCS Ltd	+44 (0)777 150 1100	Lamia.Gherbi@eni.com
Nominated Contact	Dimitri Tito	LBCCS project Manager	+44 (0) 7717 715 342	Dimitri.Tito@eni.com
Retained Archaeologist	Dr Bob MacKintosh	Tetra Tech RPS Energy	+44 (0) 1315 555 011	bob.mackintosh@tetratech.com
Archaeological Curator	Nicola Smith	Cadw	+44 (0) 3000 256007	nichola.smith001@gov.wales
Archaeological Curator	Julian Whitewright	Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)	+44 (0) 1970 621 217	Julian.whitewright@rcahmw.gov.uk
Archaeological Curator		Historic England		northwest@HistoricEngland.org.uk customers@HistoricEngland.org.uk

1.2.2 Responsibilities and communications

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

1.2.2.2 Liverpool Bay CCS Ltd have employed the services of Tetra Tech RPS Energy as the Retained Archaeologist to ensure the effective implementation of the WSI and other relevant commitments in relation to archaeology.

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

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

1.2.2.5 In Welsh waters the relevant Archaeological Curator is Cadw, with further support from RCAHMW. Both will be consulted with regard to activities undertaken as part of this WSI.

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

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

1.2.2.8 The responsibilities of the Retained Archaeologist will include:

- maintaining, reviewing and updating the WSI, as required;
- advising Liverpool Bay CCS Ltd on the necessary archaeological works and input required to the stipulations of this WSI are met;
- advising Liverpool Bay CCS Ltd which elements warrant archaeological involvement;
- advising Liverpool Bay CCS Ltd in the course of evaluating scope of work specifications on their capacity to meet archaeological requirements;
- advising Liverpool Bay CCS Ltd on the necessary interaction with third parties with archaeological interests, including the Archaeological Curator;
- advising Liverpool Bay CCS Ltd on the implementation of generic archaeological requirements applicable to all construction activities;
- advising Liverpool Bay CCS Ltd on the micrositing of infrastructure covered by this WSI, based upon archaeological results from Environmental Impact Assessment (EIA) and pre-construction surveys;
- advising Liverpool Bay CCS Ltd on Method Statements for archaeological investigations;
- preparing Method Statements for archaeological activities;
- ensuring that the project contact copies Method Statements to the Archaeological Curator for approval;
- implementing and monitoring the Protocol for reporting finds of archaeological interest based on the Protocol for Archaeological Discoveries;
- monitoring the work of and liaising with the Archaeological Contractor(s) where this is not the Retained Archaeologist;

- monitoring the preparation and submission of Archaeological Reports, as appropriate, and making them available to the Archaeological Curator;
- preparing provisions for the management of the project archives in consultation with an appropriate Museum; and
- advising Liverpool Bay CCS Ltd on final arrangements for analysis, archive deposition, publication and popular dissemination and the necessary schedule for these deliverables.

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

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

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

1.2.2.11 Other roles are referred to within this document. Where this is the case these roles, and associated definitions, can be found within the Protocol for Archaeological Discoveries (section 1.5.5 and Appendix A). These roles include the Site Champion and Nominated Contact.

1.2.3 Arrangements for reviewing the WSI

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

1.2.4 Monitoring compliance with the WSI

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

1.2.4.2 Following this advice, appropriate method statements will be prepared as required for each element of the project which requires archaeological involvement, in line with the requirements of the WSI. These will be submitted to the Regulator and the Archaeological Curator for approval. Approval by the Curator will be assumed if no response is received within 30 working days of submission. The Retained

Archaeologist will ensure compliance with these method statements during the subsequent works, thereby also ensuring compliance with the WSI.

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

1.2.4.4 The responsibility for ensuring the implementation of the PAD (Appendix A) rests with Liverpool Bay CCS Ltd, who will ensure that its agents and contractors are contractually bound to implement the PAD.

1.2.4.5 Based on section 1.5.5 and Appendix A below, Liverpool Bay CCS Ltd and the Retained Archaeologist will agree the system for archaeological reporting through the PAD.

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

1.2.5 Health and safety

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

1.2.5.2 All work will be carried out in accordance with the requirements of Liverpool Bay CCS Ltd's Health and Safety Plans for the project, as well as the Health and Safety at Work etc. Act 1974, the Management of Health and Safety at Work Regulations 1999, the SCAUM (Standing Conference of Archaeological Unit Managers) health and safety manual Health and Safety in Field Archaeology (SCAUM, 2007) and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

1.3 Summary of known and potential archaeology

1.3.1.1 A baseline assessment including desk-based assessment and archaeological assessment of geophysical survey data was undertaken in support of the Environmental Statement (ES) (Liverpool Bay CCS Ltd, 2023a). The following sections contain a summary of the findings.

1.3.2 Summary of designated heritage assets

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

- the Protected Wreck of the *Resurgam* (Liverpool Bay CCS Ltd, 2023a: E_001). The *Resurgam* was an experimental submarine built in 1870. It is designated under the Protection of Wrecks Act 1973, and has an associated designated area with a 300 m radius. The wreck itself lies outside the Eni Development Area but the designated circle extends to within the Area of Project Physical Work and Eni Development Area.

1.3.2.2 Two other designated heritage assets lie beyond the Area of Project Physical Work and the Eni Development Area, but are relevant as they were identified within the Marine Archaeology Study Area (Liverpool Bay CCS Ltd, 2023a). These are:

- the Scheduled wreck of the *Lelia*, a paddle steamer built in 1864 and associated with the British involvement in the American Civil War (Liverpool Bay CCS Ltd, 2023a: E_002). It is designated under the Ancient Monuments and Archaeological Areas Act 1979 and lies approximately 10 m beyond the

Eni Development Area boundary, on its eastern side. It has been given an AEZ that extends to within the Eni Development Area.

- the Grade II Listed Point of Ayr Lighthouse, thought to have been built in c. 1776 (Liverpool Bay CCS Ltd, 2023a: E_003). It is designated under the Planning (Listed Buildings and Conservation Areas) Act 1990, and lies approximately 1 km to the east of the proposed Landfall site and Eni Development Area.

1.3.3 Summary of non-designated heritage assets

1.3.3.1 A series of non-designated heritage assets lie within the Area of Project Physical Work and the Eni Development Area. These are summarised below and are based on all available desk based and geophysical data, tying in information from pre-existing datasets and the archaeological assessment of geophysical survey data undertaken as part of this project (Liverpool Bay CCS Ltd, 2023a; MSDS Marine, 2023). Magnetic anomalies are listed separately in the Marine Archaeology Technical Report (Liverpool Bay CCS Ltd, 2023a).

1.3.3.2 There is a total of 176 records within the Eni Development Area, and 110 within the Area of Project Physical Work, giving a total of 286 records. The majority relate to heritage assets, however, a number of geophysical anomalies have been interpreted as of being geological in nature. These are included in **Table 1.3** below for completeness but are not considered further.

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

Table 1.3 Summary of Non-designated Heritage Assets

Broad Category	Type	Number of Heritage Assets in Area of Project Physical Work	Number of Heritage Assets in Eni Development Area
Wreck remains	Wreck	2	30
	Wreck (probable)		1
	Wreck or Ballast mound		1
	Wreck or beacon		2
	Wreck or debris		2
	Wreck or Wreckage (possible)		1
	Wreckage		13
	Possible wreck	3	
	Possible wreckage		1
Other maritime remains	Anchor, chain and cable		2
	Beacon		3
	Chain, Cable, or Rope	4	
	Collapsed platform		1
	Debris	5	3

Broad Category	Type	Number of Heritage Assets in Area of Project Physical Work	Number of Heritage Assets in Eni Development Area
	Debris - likely infrastructure	20	
	Fisherman's fastener		1
	Fishing gear	3	
	Tower		2
	Foul		2
	Geophysical anomaly - debris		1
	Geophysical anomaly - origin unknown		3
	Geophysical anomaly - possible debris		2
	Mound	1	
	Obstruction		3
	Obstruction: Non-submarine contact		3
	Platform		1
	Possible oil rig leg		1
	Potential debris	32	1
	Unidentified obstruction	9	75
	Unknown	1	
	Seabed disturbance	1	
	Linear feature	3	
	Mattresses	2	
	Spoil ground		1
Geological features	Geology	5	10
	Likely geological	14	1
Terrestrial and Coastal Features	Terrestrial - position in error	2	1
	Test record.		4
Documentary Records	Aircraft (NLO)		2
	Wreck (NLO)	2	1
	Wreck (not found)	1	1
Total		**110**	**176**

1.3.4 Submerged prehistoric archaeology

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

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

1.3.4.3 Assessment of geophysical, geotechnical and desk based sources has led to the identification of three main Quaternary units within the Eni Development Area, overlying bedrock (Liverpool Bay CCS Ltd, 2023a; MSDS Marine, 2023; Fugro, 2023). The Quaternary units represent the environmental shift from glacially and proglacially dominated conditions of the Devensian (represented by Unit III and II), to later potentially pre-transgressional environments (possibly represented by Units II and I), followed by the modern active marine environment which characterises the Eni Development Area today (Unit I). These units, and their archaeological and palaeoenvironmental potential are summarised below.

Middle and Upper Palaeolithic

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

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

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

Mesolithic

1.3.4.7 Unit I is interpreted as the Surface Sands Formation. This formation includes two members, SL1 and SL2. The lower (earlier) SL2 member, represents intertidal to marine environments. A borehole taken to the South-west of the Eni Development Area produced evidence of reed beds dating to 9,200 BP within this member, indicating a potential pre-inundation land surface dating to the early Mesolithic. Landscape modelling by Fitch *et al.* (2011) also indicate potential for fluvial features within this Unit, which (when

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

1.3.5 Maritime and coastal remains

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

Prehistoric to Romano-British

1.3.5.2 While trade networks and maritime travel are evidenced throughout prehistory by the movement of ideas, goods and people, faunal assemblages indicate that maritime activities such as fishing were focused in coastal areas during the prehistoric and Roman periods, with limited evidence for marine exploitation from the Neolithic and throughout much of prehistory. Direct physical evidence of maritime craft dating to the prehistoric or Romano-British periods is very rare, though examples of watercraft exist from the Mesolithic period onward. There have been no finds of maritime remains dating to the prehistoric or Romano-British periods within the Area of Project Physical Work nor the Eni Development Area. Mesolithic and later footprints and a findspot of a Roman brooch are recorded from the wider Marine Archaeology Study Area, the former in the intertidal zone at Formby, and the latter at the mouth of the River Dee, indicating general activity in these periods (further supported by the presence of major Roman centres such as at Chester, approximately 30 km South-east of the Marine Archaeology Study Area, and other scattered settlement on the Wirral and North Wales coast (Allen *et al.,* 2016), though given the rarity of maritime remains the potential for such remains to occur within the Eni Development Area is extremely limited.

Early Medieval to Medieval

1.3.5.3 Maritime technology and activity continued to develop in the early medieval and medieval periods. Invaders, and then settlers from Scandinavia and other areas brought new boat building technologies and opportunities for trade which led to the growth of a number of major ports around the coast of the UK (Hutchinson, 1997; Friel, 2003). In the North-west of England and North Wales activity in this period is attested to by place name evidence and historical records. A possible Norse ship has also been identified at Meols, approximately 12 km east of the Eni Development Area. The results of radiocarbon dating and dendrochronology are awaited to confirm the date and origin of the vessel, however, its potential presence and the wider evidence of Scandinavian activity in the area demonstrates the potential for maritime activity in the area during this period.

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

excavated approximately 2.5 km south of the Eni Development Area, indicating medieval activity in the area.

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

Post-medieval to modern

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

1.3.5.7 Potential for maritime remains therefore increases from the post-medieval period onward with the development of ports along adjacent coastlines, such as Liverpool, and increases in the number of shipping routes crossing the area. The modern period, with its increase in trade, transport and two World Wars also marks a period in which potential is increased, and the role of Liverpool in the convoy system in addition to other wartime activity increases potential in the area. In addition to these changes, developments in shipbuilding technology also occurred: vessels were increasingly constructed of iron (from the 18th century), and then steel, leaving more durable traces on the seabed which can be detected using modern survey techniques. Documentation of losses also increased, and a total of 30 records of lost vessels are recorded within the Area of Project Physical Work, Eni Development Area and Marine Archaeology Study Area, with the majority (21 records) dating from the 19th century, and others dating from the 18th century (1 record) and 20th century (7 records). Only 3 records of lost vessels are recorded within the Area of Project Physical Work and the Eni Development Area.

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

Known and recorded maritime and coastal archaeology

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

- Five sites indicating wreck remains within Area of Project Physical Work.
- fifty-one sites indicating wreck remains within the Eni Development Area.
- two sites representing possible tower bases which are thought to represent the remains of anti-aircraft forts dumped after WWII within the Eni Development Area.
- the Protected Wreck (the *Resurgam*), the designated circle for which extends to within the Area of Project Physical Work and Eni Development Area.

- other remains including mounds (which could indicate wreck sites), debris, fouls of unknown origin, and other unidentified obstructions are also present within the Area of Physical Project Work and Eni Development Area.
- magnetic anomalies of potential archaeological significance, including anomalies of high and medium potential (Liverpool Bay CCS Ltd, 2023a). The origin of the anomalies is unknown, but they have potential to be of archaeological significance.

1.3.5.10 The majority of the wrecks are undated, but where dates are indicated they demonstrate a focus on 19th and 20th century craft, which is also borne out by the documented losses within the area. All maritime and coastal remains are summarised within Table 1.3 (Liverpool Bay CCS Ltd, 2023a).

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

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

1.3.6 Aviation remains

1.3.6.1 There are no known aircraft crash sites within the Area of Project Physical Work nor the Eni Development Area. However, the assessment has identified potential for aircraft crash sites to occur, in particular associated with the use of Talacre Warren (which lies 1.5 km to the east of the landfall site) as a WWII Spitfire training camp. This potential is further demonstrated by records of nine documented losses of aircraft within the Eni Development Area and Marine Archaeology Study Area, of which around half are Spitfires. While aircraft crashes tend to result in disarticulated remains, there is potential for remains of aircraft within the Area of Project Physical Work and the Eni Development Area. Aircraft can fall under the automatic designation of the Protection of Military Remains Act 1986 and therefore their early identification and protection is vital.

1.3.7 Historic seascape character

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

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

1.3.8 Data limitations

1.3.8.1 The key limitation to the assessment was the lack of full coverage geophysical data for the area, including within the Area of Project Physical Work and Eni Development Area. Data gaps were present for example in areas where cables may require re-routing, in the intertidal zone, and in the area to the north of the *Resurgam* designated circle. The data coverage was discussed in detail in the Marine Archaeology Technical Report, and the supporting archaeological assessment of geophysical survey data (Liverpool Bay CCS Ltd, 2023a; MSDS Marine, 2023). This limitation has been recognised and is being addressed

through collection of intertidal magnetometry data and drone survey, and further geophysical survey of the cable route and around each well platform (section 0).

1.4 Research agendas

1.4.1.1 The best practice guidance for Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects indicates that a WSI should 'set out the importance of research frameworks in setting objectives that are delivered through realisation of the work' (The Crown Estate, 2021).

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

- People and the Sea: A Maritime Archaeological Research Agenda for England (Ransley et al., 2013);
- The Research Agenda for Wales: Maritime and Coastal Archaeology (Cadw, 2004);
- Research Framework for the Archaeology of Wales 2021-2026: Maritime Chapter (Groom, 2022);
- The research framework for the archaeology of Wales (IfA Wales/Cymru, 2008); and
- The North West England regional research framework (Research Frameworks, 2023).

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

1.4.1.4 The connection with the specific work package to be undertaken, and the relevant research framework, aims and objectives, will be identified within the Method Statements which will proceed archaeological work. The Method Statement will also set out how the work undertaken will be tied into the relevant research framework during OASIS reporting (section 1.6.2).

1.5 Mitigation

1.5.1 Embedded mitigation and project commitments

Embedded mitigation

1.5.1.1 A series of embedded mitigation measures have been adopted as part of the project (Liverpool Bay CCS Ltd, 2024). The below list also contains reference to the relevant section of this WSI which describes details and methods relevant to each of the measures.

- implementation of Exclusion Zones:
  - the identification and implementation of AEZs around those sites identified as having high and medium archaeological potential. Final cable routing, well drilling and platform construction to avoid any known archaeological constraints identified in pre-construction site investigation surveys through micrositing. AEZs are discussed further in section 0.
  - the identification and implementation of Temporary Archaeological Exclusion Zones (TAEZs) based on all available information including the stated positional accuracy, the recorded size of the target and the potential archaeological significance around those records for wrecks, obstructions, debris and other sites of archaeological potential outside of the survey data coverage but within the Project boundary. TAEZs are discussed further in section 0.

- Archaeological input into specifications for, and archaeological analysis of, any further pre-construction geophysical (section 0) and geotechnical surveys (section 0).
- project archaeologists to be consulted in the preparation of any pre-construction Remotely Operated Vehicle (ROV)/diver surveys and, if appropriate, in monitoring/checking of data (section 0).
- operational awareness of the location of those archaeological anomalies identified as having a low potential. Reporting through the agreed protocol will be undertaken should material of potential archaeological interest be encountered (section 1.5.5, and Appendix A).
- implementation of a protocol for recording finds of archaeological interest, following the guidance for the PAD (section 1.5.5, and Appendix A).
- archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction operations and, if appropriate, to carry out archaeological monitoring of such work (section 1.5.3).
- mitigation of unavoidable direct impacts on known sites of archaeological significance: Options include i) preservation by record; ii) stabilisation; iii) detailed analysis and safeguarding of otherwise comparable sites elsewhere. Direct impacts upon archaeological sites are not planned and all known sites of potential significance are protected by AEZs and will be avoided by development impacts. Should potential for any unforeseen and unavoidable impacts be identified, a Method Statement will be produced in agreement with Archaeological Curators, detailing how these will be handled, and general archaeological practices (section 0) will be followed where preservation by record or detailed analysis of sites elsewhere is an agreed approach. Methods for any stabilisation and safeguarding will be site-specific and will be detailed within a Method Statement should the need for these interventions arise.
- commitment to implementation of the Offshore WSI (the current document) prior to any post-consent works within the Eni Development Area and Area of Physical Project Works.

Additional commitments

Archaeological assessment of full coverage data

1.5.1.2 In addition to the embedded mitigation measures, the project has committed to collection and archaeological review of full coverage geophysical survey data prior to project impacts. This will address gaps in the data (section 1.3.8) and ensure that mitigation can be recommended for all areas where project impacts may occur, and these recommendations will be based on recent and high resolution surveys which are appropriate for archaeological assessment. Further details in relation to this commitment are set out in section 0. While recommendations for mitigation cannot be made prior to the assessment of the data, potential outcomes may be recommendations for further AEZs (section 0) or for watching briefs for example within the intertidal zone (section 1.5.3).

Publicly available data

1.5.1.3 The ES also made a commitment to enhance understanding of the historic environment (through assessment of geophysical and geotechnical data), and to make this data publicly available (Liverpool Bay CCS Ltd, 2024). This commitment will be secured through reporting, publication and use of OASIS V (section 1.6).

1.5.2 Exclusion zones

Archaeological exclusion zones

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

1.5.2.2 In view of their potential archaeological significance, AEZs (either in the form of individual AEZs or clusters) will be placed around the nine locations which include the Protected Wreck of the *Resurgam*, and Scheduled wreck of the *Lelia*, both of which have statutory designated areas, included here as AEZs. The others represent high and medium potential anomalies identified by the geophysical data assessment. These anomalies have been recommended AEZs based on the size of the anomaly, the extents of any debris, the potential significance of the anomaly, the potential impact of the development and the seabed dynamics within the area. Dependant of the form of the anomaly, AEZs have either been recommended as a radius from the centre point of the anomaly or as a distance from the extents. Particularly in the case of shipwrecks, which tend to be longer in length than width, the use of a circle provides unequal protection around the extents. This not only impacts the protection afforded but does not present proportional mitigation. The proposed AEZs are listed in Table 1.4 and shown in Figure 1.3 to Figure 1.5. All positions are given in the European Datum 1950 (ED50) and Universal Transverse Mercator (UTM) Zone 30 North projection (ED50 Z30N).

1.5.2.3 The designated wreck of the *Resurgam* and the statutory protected area (Statutory Instrument 1996 No. 1741), have been included within this section. Whilst the wreck lies outside of the Eni Development Area and the Area of Project Physical Work the statutory protected area extends into these areas. To note, the designated area is not centred on the location of the wreck as provided by UKHO (detailed in Table 1.4), the location of the designated area is presented in Figure 1.3 and Figure 1.4 (note that cables routed through the protected area are already in existence, pre-dating the designation of the wreck, but proposed cable routes avoid the designated area). Likewise, the scheduled wreck of the *Lelia* has also been included to ensure awareness due to proximity to the Eni Development Area.

Table 1.4 Archaeological Exclusion Zones

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

1.5.2.4 The final development layout will take into account these AEZs, which may evolve or be removed (with the agreement of Cadw and HE) as the Project progresses, subject to layout designs and additional subsequent surveys that may be required. Scope is allowed for their amendment in light of further evidence. Currently, planned cable routes bisect a number of AEZs. This issue has been discussed with the RCAHMW during the pre-application period, and a solution developed. This solution involves options to investigate AEZs further and refine the extents of AEZs where appropriate; and/or to re-route around these AEZs and to collect and assess data from the wider area to do so (ensuring that impacts do not take place before archaeological assessment of full-coverage geophysical data has been conducted, including on any deviations to the cable routes necessary to avoid AEZs). This work will take place prior to any seabed impacts in the area, and there will be no impacts to finalised AEZs during construction, operation, maintenance and decommissioning activities. The options and workflows for ensuring there are no impacts to AEZs are set out within Figure 1.2, and further survey work is discussed in section 0.

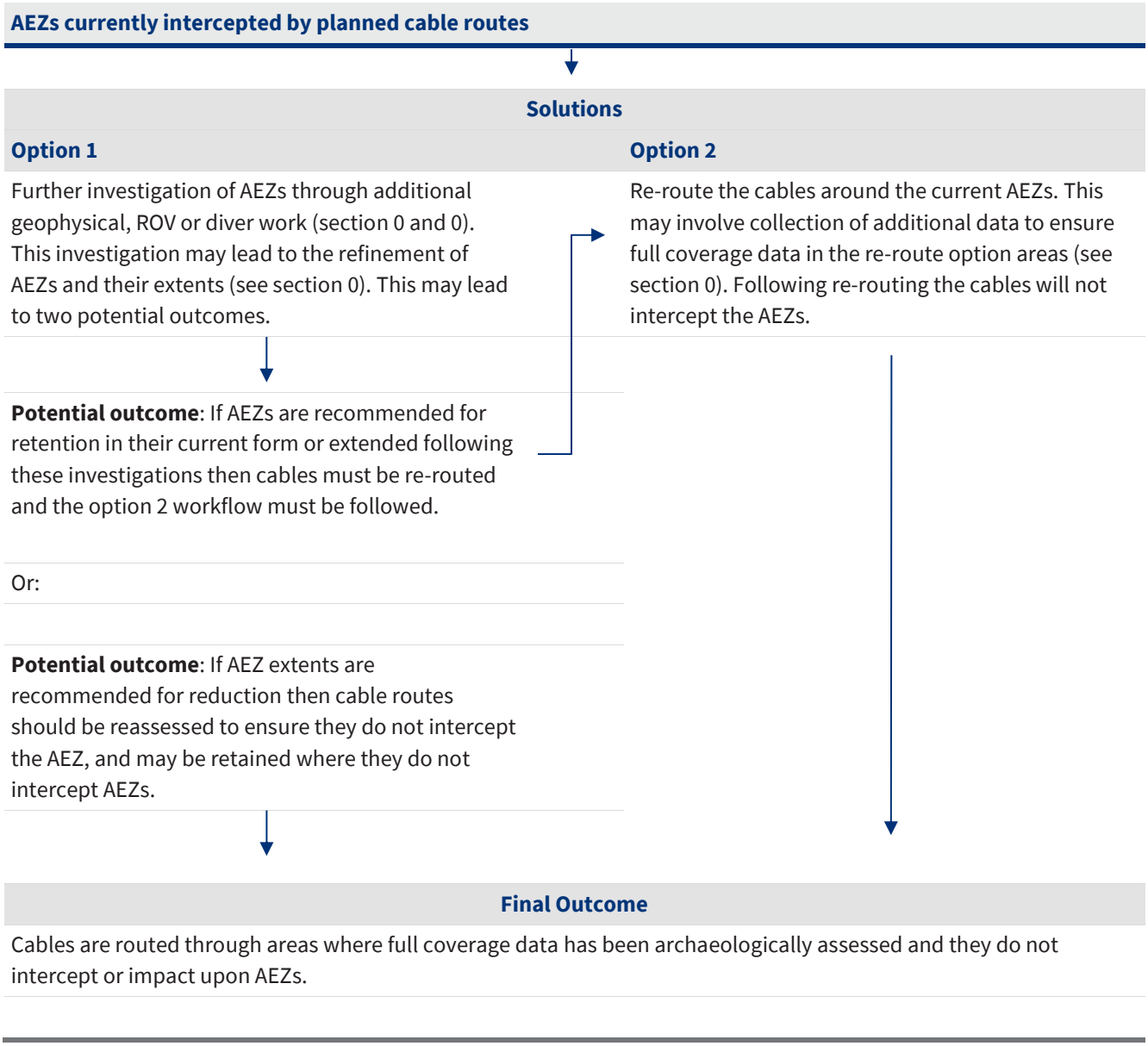

Figure 1.2 Workflow for Ensuring There Are No Development-Related Impacts Within AEZs

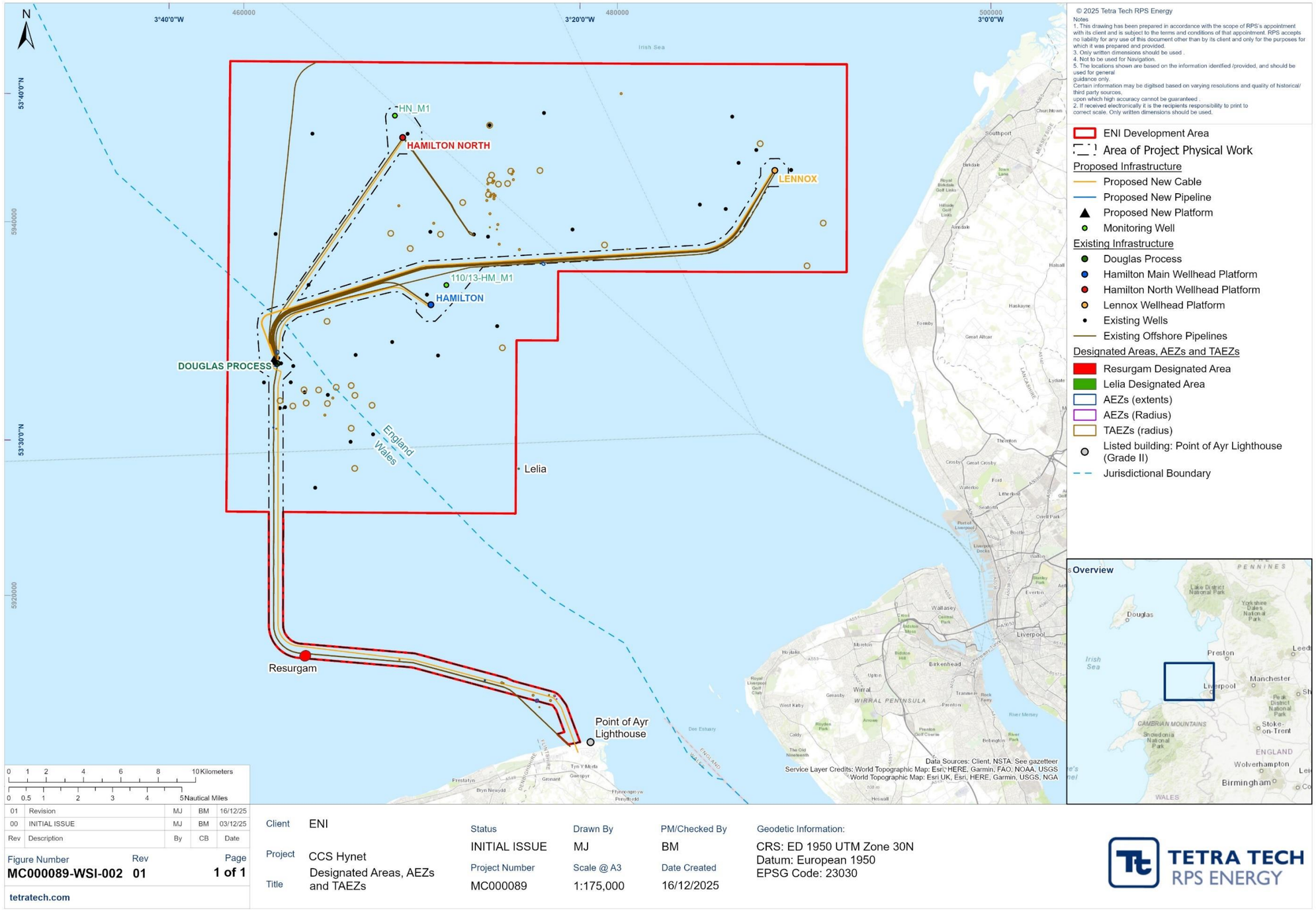

Figure 1.3 Distribution of Designated Areas, AEZs, TAEZs

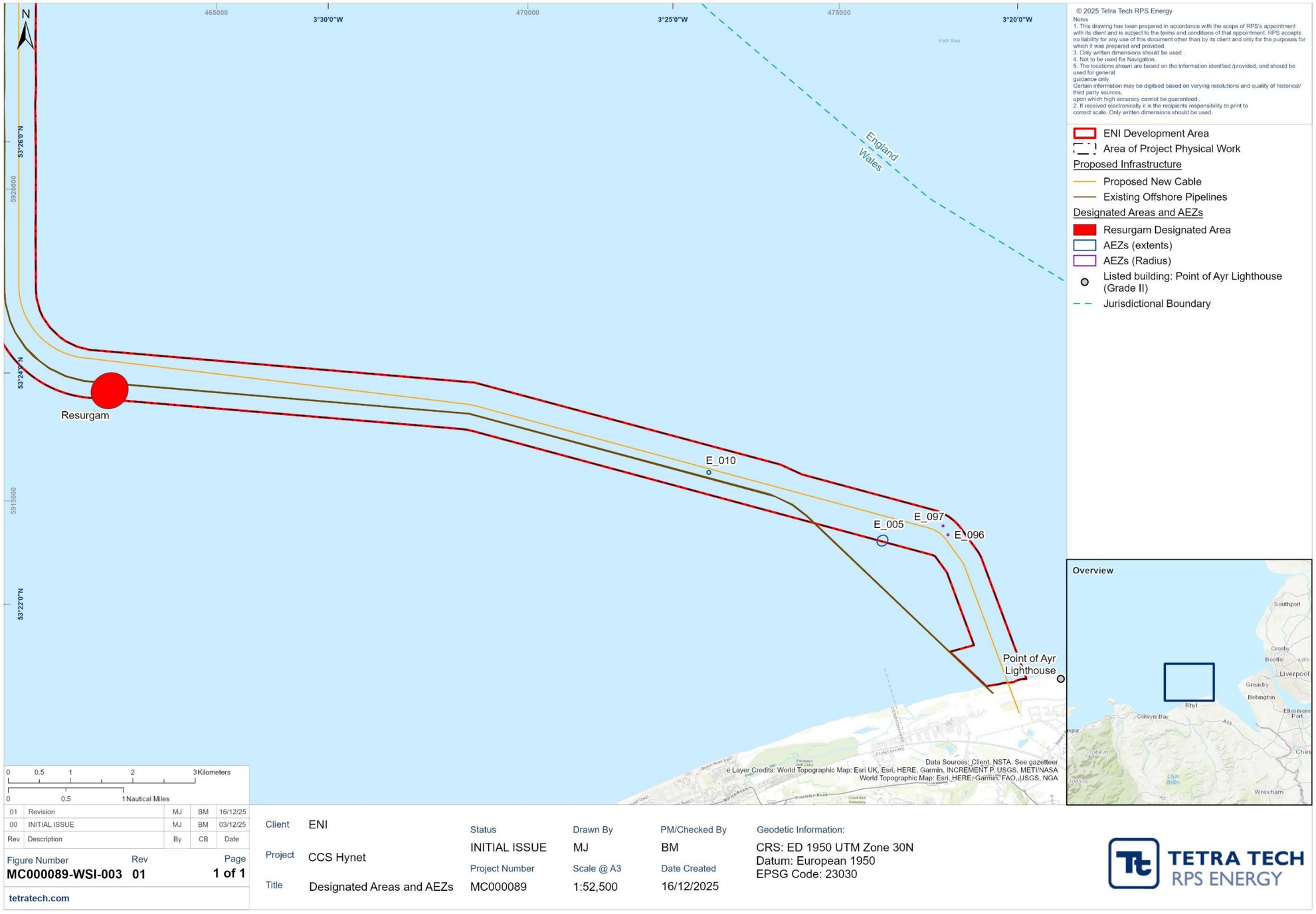

Figure 1.4 Distribution of Designated Areas and AEZs (South)

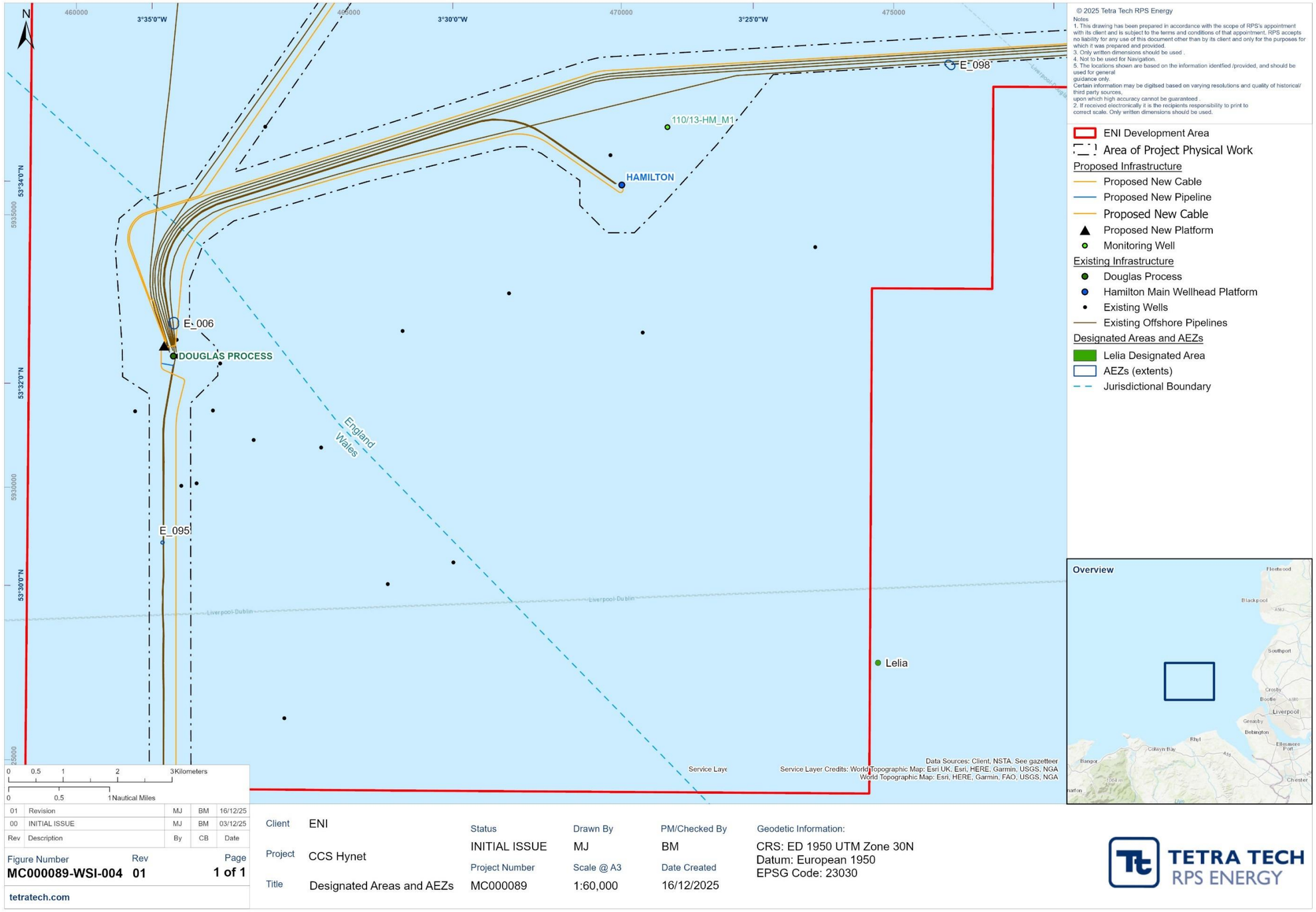

Figure 1.5 Distribution of Designated Areas and AEZs (North)

Temporary archaeological exclusion zones

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

1.5.2.6 TAEZs have been assigned where remains are thought to be of medium, high or uncertain archaeological potential. All wreck remains which lie within the Area of Physical Project Work and Eni Development Area, listed in Table 1.3 have been recommended either AEZs or TAEZs. Other maritime remains including wreck sites or potential wreck sites, wreckage, the two potential WWII anti-aircraft towers, and unidentified fouls, obstructions, debris and magnetic anomalies have been recommended for TAEZs where they are considered to be of potential high or medium archaeological significance or where the significance is as yet unknown. Those remains which have not been recommended for protection by a TAEZ have been excluded following assessment which has determined their low archaeological potential. This is the case for maritime remains including chain cable or rope, collapsed oil platforms, likely infrastructure, fishing gear, concrete mattresses and other similar remains. Other remains which have not been recommended for protection by a TAEZ have been excluded where assessment has determined an unlikelihood of remains being present at the given location (e.g. fisherman's fastenings and unidentified obstructions connected with records of fisherman's fastenings, unidentified non-submarine contacts, and spoil ground, the extents of which are unknown). All terrestrial assets (see summary in Table 1.3) lie beyond the Area of Physical Project Work and Eni Development Area, and are therefore not recommended AEZs. Likewise documentary records are not recommended for TAEZs due to the low likelihood of physical remains at the given locations. In summary, the assessment has determined the following groupings of remains, and has made the following recommendations:

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

- wrecks, wreckage and wreck remains.

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

- debris;
- mounds; and
- two potential WWII anti-aircraft towers.

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

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

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

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

- unknown anomalies;
- seabed disturbance; and
- linear features.

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

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

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

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

1.5.2.13 The size of the TAEZs takes into consideration the proximity of available survey data, the potential to represent material of archaeological significance, the perceived accuracy of the position, and other anomalies that may be present within the surrounding area. Anomalies and their recommended exclusion zones are detailed in Table 1.5 and the distribution presented in Figure 1.3, with detailed distributions in Figure 1.6 to Figure 1.10.

1.5.2.14 E_421 is a magnetic anomaly that is now located outside the Eni Development Area following alteration of the area near the landfall. It has been retained for completeness.

Table 1.5 Temporary Archaeological Exclusion Zones

ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	TAEZ (m)	TAEZ Type
E_013		Wreck	461936.41	5930419.47	150	Radius
E_016		Wreck	465945.89	5930704.11	150	Radius
E_017		Wreck	464004.01	5930992.88	150	Radius
E_018		Wreck	462622.61	5930132.13	150	Radius
E_019		Wreck	464944.29	5931135.99	150	Radius
E_020		Wreck	465748.98	5928944.17	150	Radius
E_021		Wreck	463219.55	5931000.80	150	Radius
E_022		Wreck	463335.60	5930295.26	150	Radius
E_023		Wreck	464473.68	5930268.00	150	Radius
E_025		Wreck	479313.15	5938753.40	150	Radius
E_026		Wreck	475854.12	5942736.87	150	Radius
E_027		Wreck	471718.37	5941023.76	150	Radius

ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	TAEZ (m)	TAEZ Type
E_030		Wreck	466862.89	5930172.27	150	Radius
E_031		Wreck	464452.73	5934664.68	150	Radius
E_032		Wreck	474292.18	5942705.61	150	Radius
E_033		Wreck	473631.37	5942010.22	150	Radius
E_034		Wreck	473171.83	5942226.08	150	Radius
E_035		Wreck	473101.25	5941451.39	150	Radius
E_036		Wreck	473268.12	5942491.94	150	Radius
E_037		Wreck	467864.91	5939373.83	150	Radius
E_038		Wreck	468907.26	5938563.40	150	Radius
E_040		Wreck	470529.80	5939325.49	150	Radius
E_043		Wreck	487647.24	5944174.28	150	Radius
E_044		Wreck	491021.93	5939923.43	150	Radius
E_045		Wreck	465747.15	5931230.86	150	Radius
E_048		Wreck	474120.98	5942040.87	150	Radius
E_052		Wreck	490156.38	5937636.74	150	Radius
E_054		Wreck	465936.15	5926795.95	50	Radius
E_058		Wreck	473841.36	5933249.41	150	Radius
E_059		Wreck	473159.97	5945159.62	150	Radius
E_060		Wreck (probable)	464763.21	5930562.51	50	Radius
E_061		Wreck or ballast mound	480201.19	5946851.51	50	Radius
E_062		Wreck or debris	464336.38	5929649.71	50	Radius
E_063		Wreck or debris	473072.83	5941685.19	50	Radius
E_065		Wreck or beacon	473179.16	5940423.67	50	Radius
E_066		Wreck or beacon	473009.02	5941134.83	50	Radius
E_070		Possible wreck	475487.92	5914655.71	50	Radius
E_071		Possible wreck	476423.40	5914374.67	50	Radius
E_077		Wreck or wreckage (possible)	473394.94	5941332.89	50	Radius
E_078		Wreckage	473064.82	5942019.01	50	Radius
E_079		Wreckage	473389.80	5942176.62	50	Radius
E_080		Wreckage	473345.74	5942182.43	50	Radius
E_081		Wreckage	470165.92	5939914.90	50	Radius
E_082		Wreckage	473371.50	5941477.66	50	Radius
E_083		Wreckage	473320.94	5942089.94	50	Radius
E_084		Wreckage	474352.15	5942547.71	50	Radius
E_085		Wreckage	473458.15	5941397.43	50	Radius
E_086		Wreckage	473598.25	5939846.47	50	Radius
E_087		Wreckage	474751.24	5938506.90	50	Radius
E_088		Wreckage	474431.87	5942248.70	50	Radius
E_089		Wreckage	473195.50	5941352.57	50	Radius

ID	Geophysical ID	Type	Easting (ED50 UTM30N)	Northing (ED50 UTM30N)	TAEZ (m)	TAEZ Type
E_090		Wreckage	473230.14	5941433.96	50	Radius
E_091		Possible wreckage	473391.01	5941223.52	50	Radius
E_093		Debris	473446.03	5941399.36	50	Radius
E_094		Debris	474424.38	5942693.77	50	Radius
E_179		Tower	468297.63	5940854.15	50	Radius
E_180		Tower	473671.77	5938796.54	50	Radius
E_188		Obstruction	480525.48	5938531.93	25	Radius
E_194		Foul	473550.44	5939581.58	25	Radius
E_195		Foul	473170.61	5939698.70	25	Radius
E_421	CCS23_M206	Magnetic anomaly	475824.10	5914015.10	25	Radius
E_422	CCS23_M220	Magnetic anomaly	473906.20	5915305.70	25	Radius
E_423	CCS23_M221	Magnetic anomaly	468331.60	5916557.80	25	Radius
E_424	CCS23_M235/237	Magnetic anomaly	473810.20	5915328.80	50	Radius
E_425	CCS23_M268	Magnetic anomaly	461729.30	5928916.40	25	Radius
E_426	CCS23_M199	Magnetic anomaly	476341.72	5914668.39	25	Radius
E_427	CCS23_M215	Magnetic anomaly	476634.56	5914622.80	50	Radius

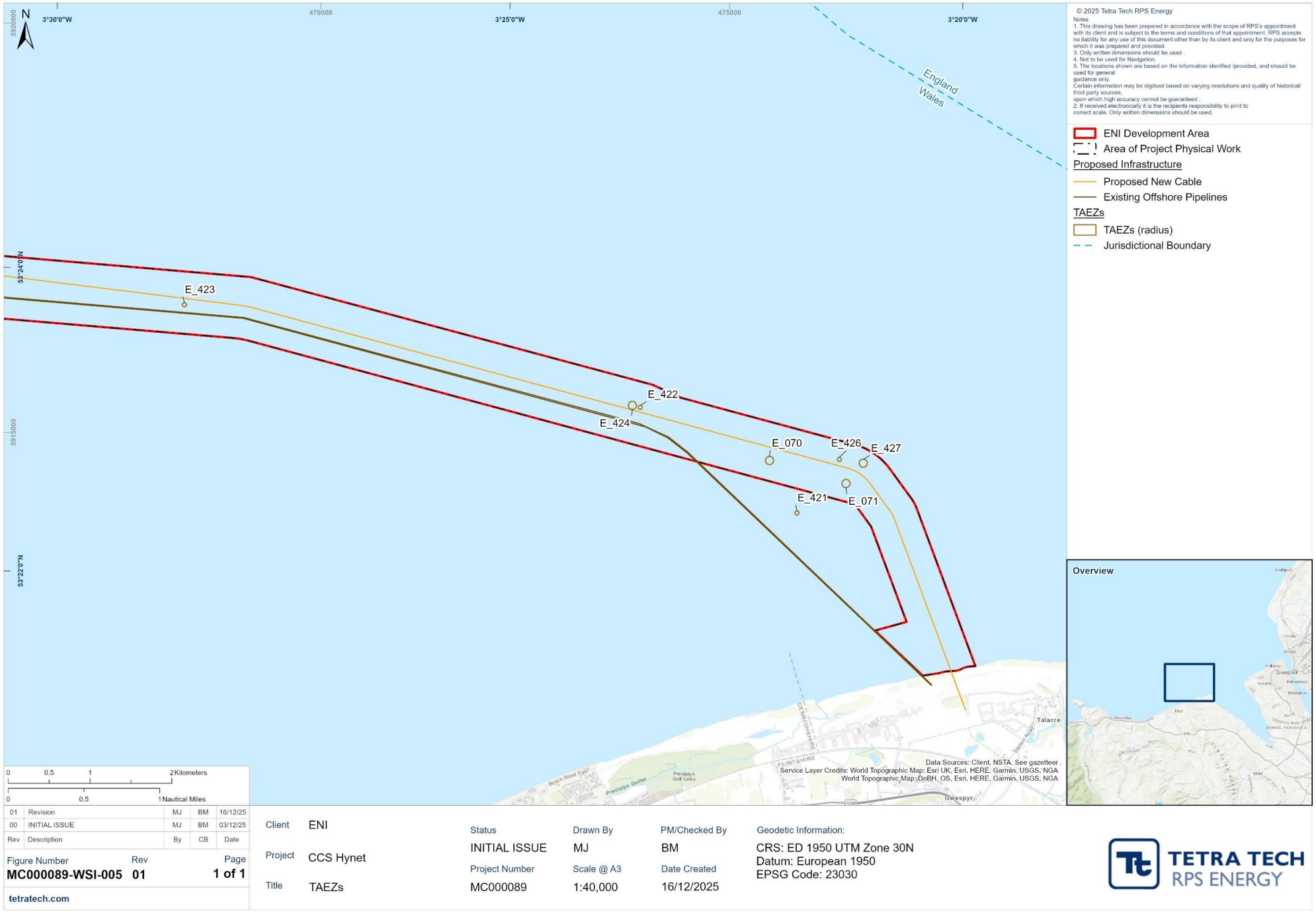

Figure 1.6 Distribution of TAEZs (Southern Cable Route and Landfall)

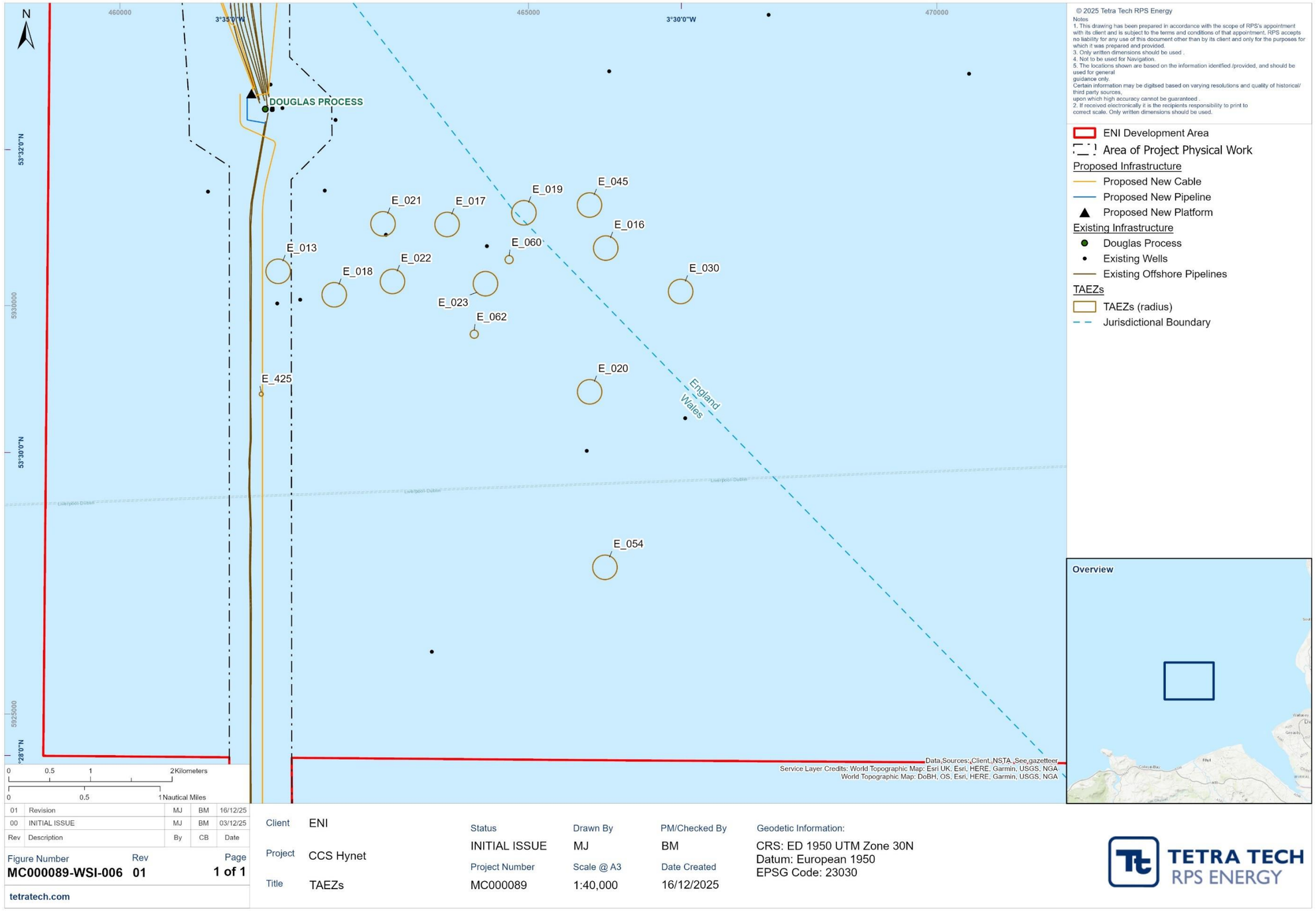

Figure 1.7 Distribution of TAEZs (South of Douglas Platform)

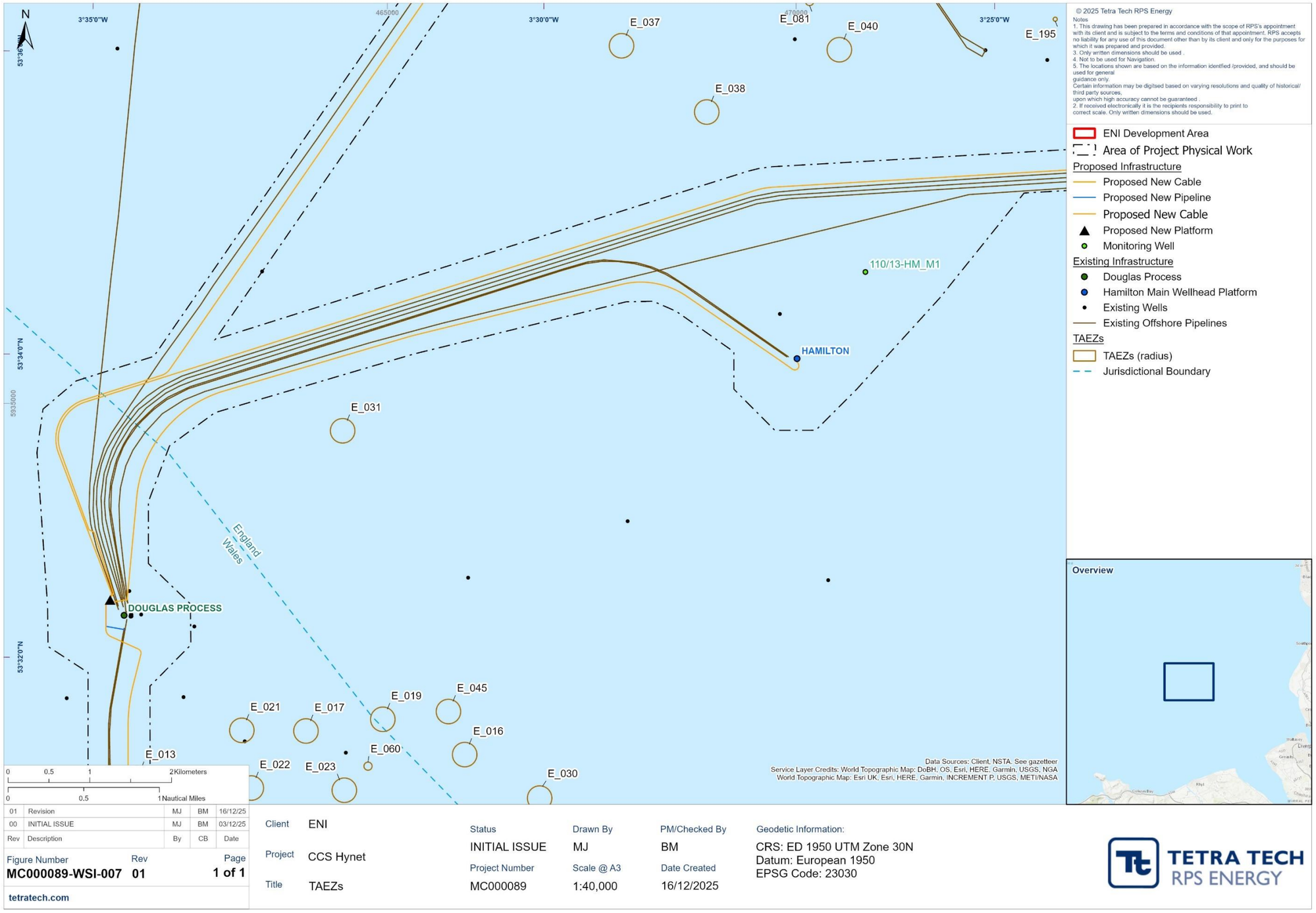

Figure 1.8 Distribution of TAEZs (North of Douglas Platform)

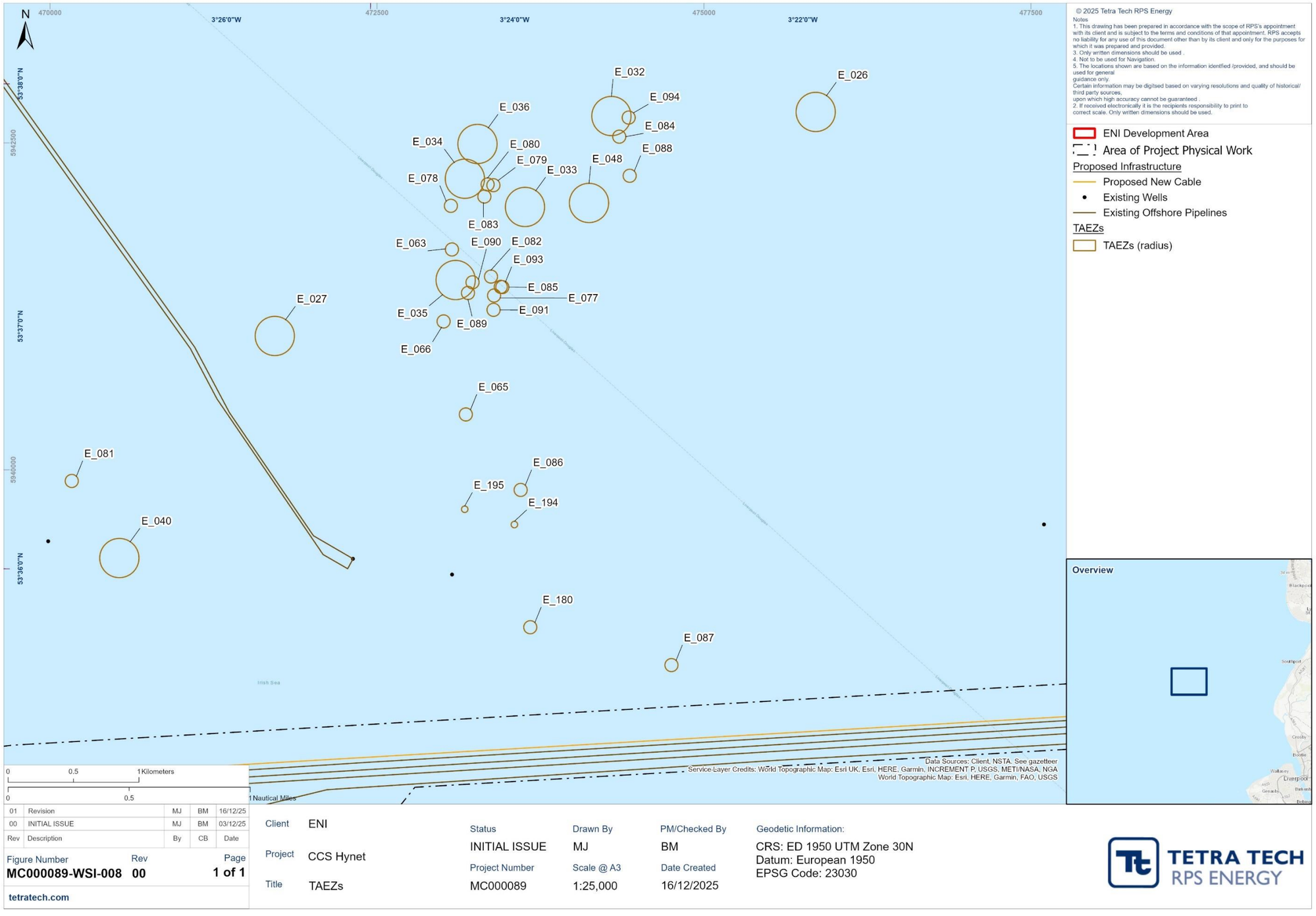

Figure 1.9 Distribution of TAEZs (Between Hamilton Platforms)

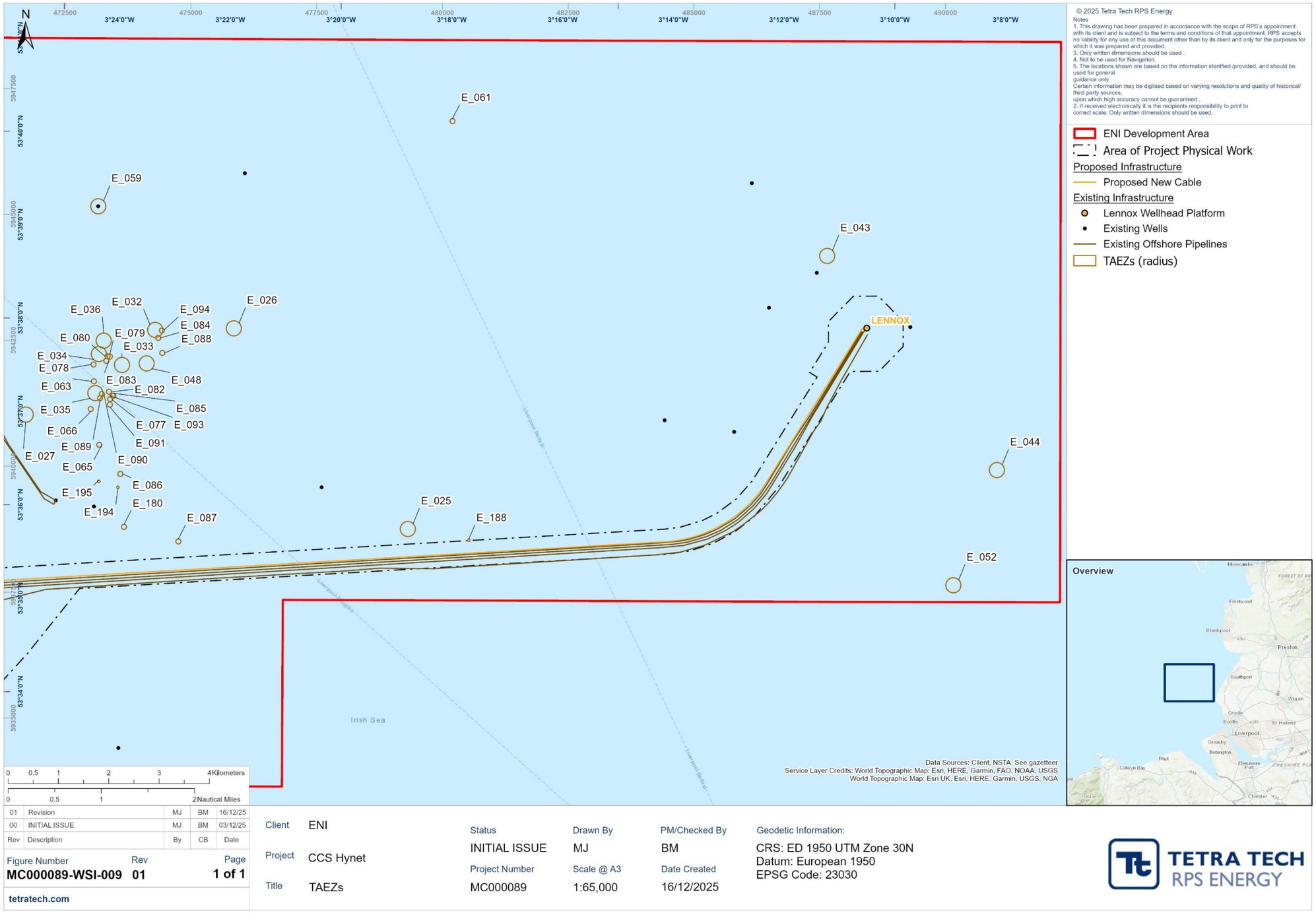

Figure 1.10 Distribution of TAEZs (Eastern Area to Lennox Platform)

Establishing new archaeological exclusion zones

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

1.5.2.16 All finds of archaeological material will be reported to the Nominated Contact by the Construction Contractor(s), in accordance with the PAD (Section 1.5.5 and Appendix A). The Nominated Contact will inform the Retained Archaeologist and then the Archaeological Curator of all reports.

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

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

Altering archaeological exclusion zones

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

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

Monitoring archaeological exclusion zones

1.5.2.21 The effectiveness of the AEZs and TAEZs will be monitored by regular review by the Retained Archaeologist of vessel track plots and anchor spots supplied by Liverpool Bay CCS Ltd. This data will be reviewed monthly by the retained archaeologist, at a minimum.

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

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

1.5.3 Archaeological monitoring

1.5.3.1 The following commitment in regard to monitoring has been made:

Archaeologists are to be consulted in the preparation of pre-construction cable route clearance or other pre-construction operations and, if appropriate, to carry out archaeological monitoring of such work (Liverpool Bay CCS Ltd, 2024).

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

Marine watching brief

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

1.5.3.4 Following the review of magnetometry data and drone survey data covering the area from below the HDD exit pits to the area below MLWS (which was previously identified as a data gap (section 1.3.8)) by the Retained Archaeologist or Archaeological Contractor, recommendations as to the need for an intertidal watching brief or other mitigation will be made. These recommendations will be agreed with the Archaeological Curators. The feasibility of an intertidal watching brief may also depend on the excavation methods chosen.

1.5.3.5 The excavation of the HDD exit pits will be subject to a watching brief, with the methods set out in a separate Method Statement intended to discharge an archaeological planning condition (ref. FUL/000246/23, dated 06 April 2023) attached to the planning permission given under the Town and Country Planning Act 1990 (Eni, 2025).

Watching brief methods

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

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

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

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

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

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

Recording and reporting

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

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

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

1.5.3.14 Positions will be related to National Grid and Ordnance Datum (landward of MLWS) or ED50 UTM Zone 30N for the offshore elements of the scheme.

1.5.3.15 The archaeological results will be compiled in a report by the Archaeological Contractor, in accordance with the requirements outlined in Standard and Guidance for archaeological watching briefs (CIfA, 2014a), and in accordance with reporting procedures set out in section 1.6.3.

1.5.4 General archaeological practices

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

Survey and recording

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

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

Positioning

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

Finds and conservation

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

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

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

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

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

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

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

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

Human remains

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

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

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

1.5.5 Protocol for reporting finds of archaeological interest

1.5.5.1 A PAD will be implemented during all activities relating to construction, operation, maintenance and decommissioning (Appendix A). It will address the reporting of unexpected finds of archaeological material, recovered from the sea during these activities.

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

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

1.5.5.4 All finds of archaeological material will be reported by the Construction Contractor(s), to the Site Champion, and then on to the Nominated Contact who will inform the Retained Archaeologist and then the Archaeological Curator. If the find is 'wreck' within the meaning of the Merchant Shipping Act 1995 then the Nominated Contact will also make a report to the Receiver of Wreck, with support of the Retained Archaeologist. Full contact details for all relevant parties are included in Table 1.2.

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

1.5.5.6 The PAD will be implemented by means of toolbox talks presented by the Retained Archaeologist or an Archaeological Contractor to the relevant vessel crews to ensure that all staff are made aware of what constitutes an appropriate find. The frequency and timing of these toolbox talks is determined in relation to ongoing activities. The PAD will be supported by a package of awareness training for Liverpool Bay CCS Ltd and its contractors' and sub-contractor's staff.

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

1.5.6 Crashed aircraft procedures

1.5.6.1 There is potential for remains of crashed aircraft to occur within the Eni Development Area and Area of Project Physical Work (section 1.3.6). This section sets out the specific procedures to be followed in the event that remains of an aircraft are identified.

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

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

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

1.5.7 Archaeological involvement in further work

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

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

Further surveys requiring archaeological involvement

1.5.7.3 Further surveys requiring archaeological involvement include:

- geophysical survey will require an archaeological assessment of the survey dataset. This includes pre-construction surveys of the cable route and intertidal drone surveys;
- diver/ROV obstruction and UXO surveys will require an archaeological assessment of the survey dataset (Target Investigation Reports, video and positional data); and
- geotechnical investigations will require geoarchaeological assessment and, where necessary, analysis following the staged approach set out below (section 0).

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

1.5.7.5 Analysis of surveys may be phased in line with the construction programme, with analysis of surveys located between PoA Terminal to the new Douglas CCS platform being undertaken in 2026, and analysis of surveys between the new Douglas CCS platform and the Hamilton Main, Hamilton North, and Lennox platforms being undertaken in 2027.

Planning surveys

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

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

1.5.7.7 The required response to elements of archaeological input may include:

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

Fieldwork

1.5.7.8 Where further survey work has, as one of its objectives, the ensonification of previously identified sites and / or anomalies in order to alter or remove an AEZ, Liverpool Bay CCS Ltd may make provision for a suitably qualified Archaeological Geophysical Contractor to be available to provide advice and input into the survey and as the survey is ongoing. In some cases, this may include the presence of the Archaeological Contractor on the vessel alongside the vessel crew, or, in most cases, this advice may be given remotely. In all cases the archaeologist will ensure that the best possible data is collected for those anomalies subject to review.

Archaeological assessment of marine geophysical survey data

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

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

1.5.7.11 In order to maximise the potential benefits of any geophysical survey, Liverpool Bay CCS Ltd will seek archaeological input at the planning stage of any such works.

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

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

1.5.7.14 Archaeological interpretation may include:

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

1.5.7.15 An example of the criteria for assessing the archaeological potential of contacts is set out in Table 1.6.

Table 1.6 Criteria for the Assessment of Potential

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

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

Archaeological assessment of diver/ROV survey data

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

1.5.7.18 To maximise the potential benefits of any proposed diver/ROV surveys, Liverpool Bay CCS Ltd will seek archaeological input at the planning stage of any such works.

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

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

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

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

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

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

Geoarchaeological assessment of geotechnical data

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

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

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

1.5.7.26 Early input should seek to determine methods and specifications for geotechnical sampling (e.g. vibrocores, boreholes etc.) and engagement with Liverpool Bay CCS Ltd and their geotechnical team should aim to find ways to ensure archaeological aims and sampling can be conducted alongside any other requirements. Following these discussions a Method Statement for Core Collection, Transport, Retention and Storage should be produced, ensuring that cores are stored in a way which facilitates later assessment or analysis, if required. This Method Statement may also include methods for the Stage 1 and 2 geoarchaeological assessment (see below).

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

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

- **Stage 1: Geoarchaeological review of core logs:** This stage involves a desk-based assessment of the geotechnical core logs performed by a professional geoarchaeologist in order to determine which cores may be of interest. The selected cores will then be recommended for further study (Stage 2). Stage 1 assessment requires all cores to be recorded such that sediments that may be of archaeological interest can be identified. The scope of any further work will be agreed by Liverpool Bay CCS Ltd and the Archaeological Curator before proceeding to the next stage of assessment. If no further work is recommended a final report will be produced by the Archaeological Contractor.
- **Stage 2: Geoarchaeological recording:** This stage involves further study of the cores that may be of archaeological interest identified in Stage 1 to identify archaeological potential. The cores will be physically assessed by a geoarchaeologist who will confirm the sediments present within the cores and determine their archaeological potential and make recommendations for any suitable cores to be assessed further (Stage 3). At this point a report will be produced presenting the results of the Stage 1 and 2 analyses, recommending further study if necessary, and methodologies for any further work. The scope of further work will be agreed by Liverpool Bay CCS Ltd and the Archaeological Curator. If no further work is recommended, a final report will be produced by the Archaeological Contractor.

- **Stage 3: Geoarchaeological assessment:** This stage involves taking samples from the cores with archaeological potential identified in Stage 2. The samples will be analysed to determine the age and the value surviving paleoenvironmental material contained within the samples. The aims for the palaeoenvironmental analysis included establishing the preservation, diversity, and quantity of palaeoenvironmental material for the purpose of better characterising its origin environment. Any suitable material can be recommended for further study (Stage 4) if necessary. A report for the results of the Stage 3 analysis will be produced, it will also outline whether further analysis is necessary or will state if no further work is recommended.
- **Stage 4 and 5: Geoarchaeological analysis and publication:** This stage involves further, more detailed analysis of core samples. A report will be produced after this Stage including the results of all previous work, core location maps, sediment sequences, 2D and 3D images of the cores where necessary. The report will discuss the interpretation of palaeoenvironments in detail based on analysis of the cores and present all relevant information gathered during the desk-based assessments. The work will be undertaken to publication standard. The report will be forwarded to the Retained Archaeologist, who will submit it to Liverpool Bay CCS Ltd and the Archaeological Curator.

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

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

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

1.6 Activities subsequent to investigations

1.6.1.1 Following the stipulations of the Marine Policy Statement (MPS) that "opportunities should be taken to contribute to our knowledge and understanding of our past by capturing evidence from the historic environment and making this publicly available, particularly if a heritage asset is to be lost" (Defra, 2011, paragraph 2.6.6.3), the project recognises that any future geophysical and geotechnical surveys undertaken will produce new archaeological data and understandings of the historic marine environment of the area. The results of these investigations will ultimately be made publicly available (Liverpool Bay CCS Ltd, 2024). This commitment will be satisfied by reporting, deposition of reports through the OASIS system and archiving of the project. In addition, should the results warrant it, publication will be undertaken.

1.6.2 OASIS V

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

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

1.6.2.3 An OASIS record will therefore be set up following approval of the WSI by the Archaeological Curators, to notify the relevant authorities of future work that is taking place. Liverpool Bay CCS Ltd must then ensure that archaeological reports are submitted to NRW, OPRED, Cadw, Historic England and (if the work is within the intertidal zone) CPAT following completion of any survey and subsequent investigation. The contents of this report must be agreed and accepted by the archaeological curator(s) and NRW/OPRED. Liverpool Bay CCS Ltd must then ensure that a copy of the agreed archaeological report is submitted through the OASIS form within 2 weeks of acceptance by the relevant archaeological curator(s), NRW and OPRED. Sign off on the OASIS record will be by the RCAMHW who is responsible for administering the OASIS reporting system. Liverpool Bay CCS Ltd should notify NRW and OPRED that the OASIS report has been submitted within 2 weeks of the submission.

1.6.3 Reports

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

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

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

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

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

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

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

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

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

1.6.3.9 Liverpool Bay CCS Ltd will provide a digital (pdf) copy of each report to the Archaeological Curator, NRW and OPRED (as appropriate) following survey completion.

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

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

1.6.4 Publication

1.6.4.1 In consultation with Liverpool Bay CCS Ltd and the Archaeological Curator, the Retained Archaeologist will ensure that the results of important archaeological investigations undertaken in connection with the project will be published in an integrated manner at a level that is appropriate to their significance. Publication media and all publication matters will be discussed and agreed in advance with Liverpool Bay CCS Ltd and the Archaeological Curator.

1.6.5 Archives

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

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

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

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

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

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

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

1.6.5.7 The timetable for depositing archives with the receiving repository after completion of the post-fieldwork programme will be agreed with Liverpool Bay CCS Ltd and Archaeological Curator.

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

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

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Appendix A - Protocol for Archaeological Discoveries

A.1 Purpose of the document

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

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

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

A.2 Protocol Details and Version

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

A.3 Circumstances of Discovery

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

A.4 Scope of the Protocol

Liverpool Bay CCS Ltd will employ a Retained Archaeologist to provide archaeological consultancy and to liaise with and report as appropriate to the Contractors, Liverpool Bay CCS Ltd, and the Archaeological Curator.

A.5 Operations of the Protocol

A.5.1 Introduction

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

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

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

A.5.2 Terms and Roles

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

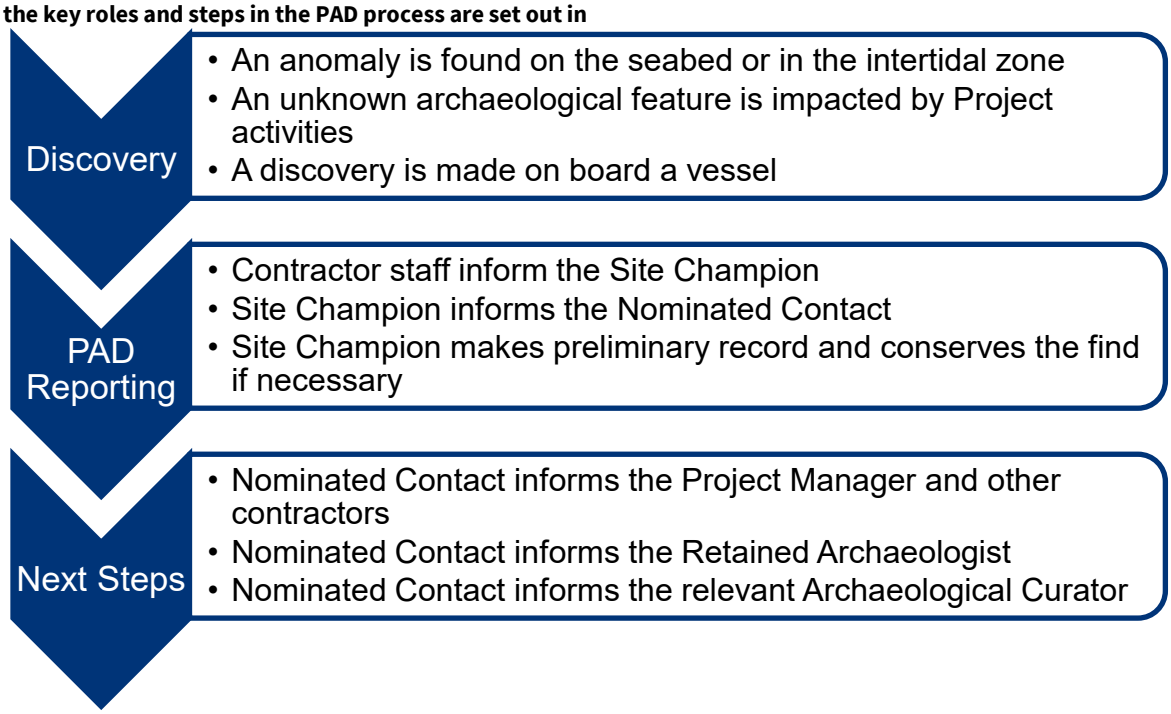

Figure 2.1.

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

The Nominated Contact will then report the find to varies relevant stakeholders including the Retained Archaeologist, Archaeological Curators (with the aid of the Retained Archaeologist if necessary) and relevant other Contractors. The Retained Archaeologist can provide specialist advice on finds identification, assessments of significance, and technical support services relating to the mitigation of the impacts of the project on the historic environment.[1]

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

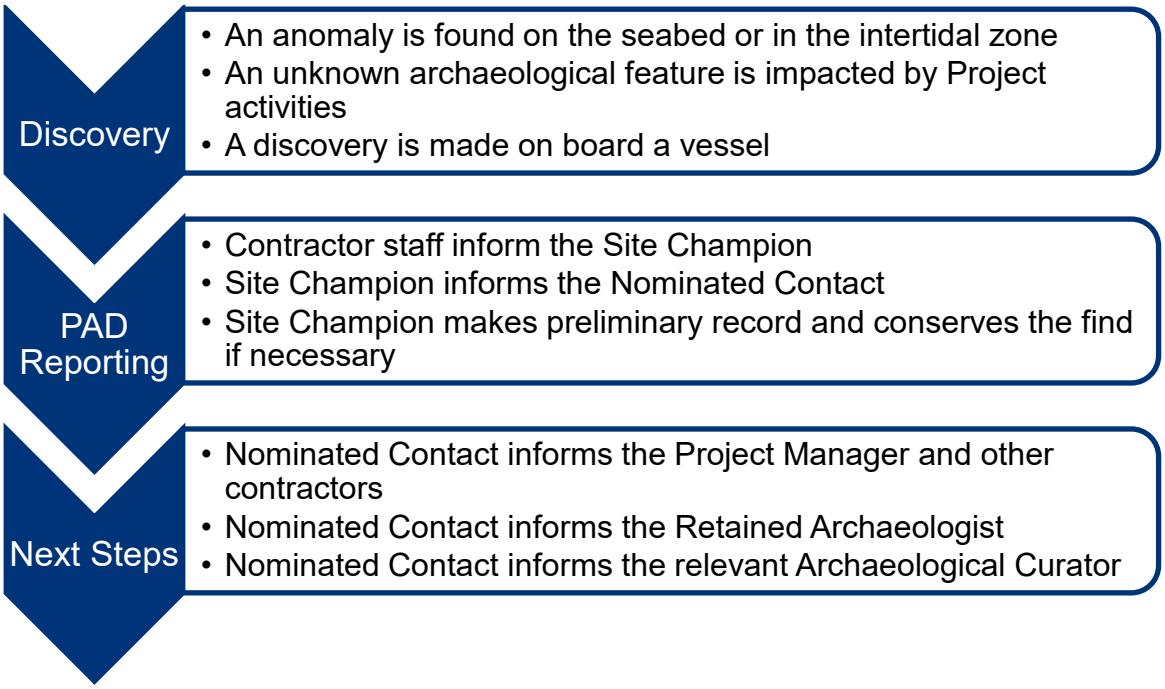

Figure 2.1 A summary of the key roles and steps in the PAD process.

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

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

A.5.3 Legal Implications

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

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

A.6 Guidelines for Identifying and Handling Finds

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

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

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

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

DO

- Handle all finds carefully
- Photograph all sides of a find with a scale
- Take close up photographs of any markings, glazing, or imagery
- Keep finds wet and ensure the water is changed regularly if biological growth is detected
- Keep finds cool and ideally in the dark
- Keep finds in protective containers where possible
- Label any finds
- Follow the information below on finds storage and contact the Retained Archaeologist if further advice is required

DO NOT

- Do not attempt to clean the find by removing any sediment build up, concretion, or marine life
- Do not allow finds to dry out
- Do not handle finds more than necessary.

A.6.1 Metal

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

A.6.1.1 Iron and Steel

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

A.6.1.2 Other Metals

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

Actions to take:

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

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

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

Table 2.1 Metals and corrosion patterns

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

A.6.2 Ceramics

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

Actions to take:

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

A.6.3 Ceramic Building Material

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

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

Actions to take:

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

A.6.4 Stone

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

Small to medium size stones that are shaped, polished and/or pierced may be prehistoric axes. All occurrences should be reported. Objects such as axe heads or knife blades made from flint are likely to be of prehistoric date and should be reported. Large blocks of stone that have been pierced or shaped may have been used as anchors or

weights for fishing nets. All occurrences should be reported. The recovery of numerous stones may indicate the ballast mound of a wreck, or a navigational cairn. All occurrences should be reported (The Crown Estate, 2014: 19).

Actions to take:

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

A.6.5 Skeletal Material and Faunal Remains

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

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

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

Actions to take:

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

A.6.6 Wood

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

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

Actions to take:

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

A.6.7 Peat and Clay

Peat is black or brown fibrous soil that formed when sea level was so low that the seabed formed marshy land, for example on the banks of a river or estuary. Peat is made up of plant remains, and also contains microscopic remains that can provide information about the environment at the time it was formed. This information helps us to understand the kind of landscape that our predecessors inhabited, and about how their landscape changed. It can

also provide information about rising sea-level and coastline change, which are important to understanding processes that are affecting us today. Prehistoric structures (such as wooden trackways) and artefacts are often found within or near peat, because our predecessors used the many resources that these marshy areas contained. As these areas were waterlogged, and have continued to be waterlogged because the sea has risen, 'organic' artefacts made of wood, leather, textile and so on often survive together with the stone and pottery which are found on 'dry' sites.

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

Actions to take:

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

A.6.8 Fibre and Textiles

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

Actions to take:

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

A.6.9 Plastic, Robber, etc

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

Actions to take:

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

A.6.10 Resinous or Mineral Substance

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

Actions to take:

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

A.6.11 Glass

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

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

Actions to take:

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

Appendix B - Protocol for Archaeological Discoveries: Preliminary Record Form

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

APPENDIX E: DROPPED OBJECTS REPORTING FORM

Boskalis

DROPPED OBJECTS REPORTING FORM

Project document number	Enter document number	**Issue date**	Pick date
Project number	Enter project number	**Location**	Enter location
Project name	Enter project name	**Reporter**	Enter reporter
Vessel object was dropped from	Enter vessel	**Signature**	
Date and time	Enter date and time		

The Dropped Object Reporting Form is to be completed for any objects dropped into the sea that have NOT been recovered and either:

- Pose a threat to the environment, or
- Pose a threat to marine traffic (e.g. anchoring or fishing operations), or
- Have a (cumulative) size larger than 0.5 m^3

Any spillage of any liquid into the sea has to be handled as an environmental incident.

Object floating or semi-buoyant?	☐ Yes ☐ No		
Geographical location of object		**Grid**	☐ Lat/Long dd°mm',m ☐ Lat/Long dd°mm'ss" ☐ UTM Zone
		Chart datum	☐ WGS84 ☐ Other:
Approx. size of dropped object **Description of dropped object (include details of hazardous substances if applicable)**			
Cause of object being dropped			
State reason why object has not been recovered:			

Close out by Vessel's Master	
Name:	
Date:	
Signature:	

APPENDIX F: SPILL NOTIFICATION FORM

Part 1: Identity of Observer / Reporter		
Full Name:	Organisation / Company:	
Contact Telephone No:	Contact E-Mail:	
Marine Licence / Permit Ref:	Contact Fax:	
Part 2: Incident Details		
Operator / Organisation / Company Responsible for Incident:		
Date of Incident:	Time of Incident:	
Other (e.g. name of witness):	Fixed / Mobile (delete as applicable)	Field Name:
Installation / Facility / Vessel: (*if vessel include type, size, IMO number, cargo*):		
Latitude (WGS84 DDD MM.MMM):		
Longitude (WGS84 DDD MM.MMM):		
Distance from coast:	Parties informed:	
Oil Release / Chemical Release or Permitted Discharge Notification (tick below and complete column details as applicable)		
Oil Release Notification: Yes / No	Chemical Release Notification: Yes / No	Permitted Discharge Notification: Yes / No
Max Released (tonnes):	Quantity Released (kg):	Max oil discharged (tonnes):
Min Released (tonnes):	Chemical Name:	Min oil discharged (tonnes):
Type of Oil: NA	Chemical Use:	Type of Oil:
Tier of Response (1,2 or 3): (As per Marine Pollution Contingency Plan)	% oil if OBM or base oil:	Oil Conc. in discharge:
	Warning label:	Discharge rate m^3/hr:
Appearance:	Appearance:	Appearance:
Approx. release area on sea surface (m^2 or km^2):	Approx. release area on sea surface (m^2or km^2):	Approx. sheen area on sea surface (m^2or km^2):
Is Release Ongoing? Yes / No (must be updated & reported each 24-hr period unless otherwise directed USCG) Release since last report (tonnes): Total volume released to date (tonnes): Responders on site? Yes / No Volume remaining on vessel:		
Source of pollution:		
Cause of pollution:		
Steps taken to prevent re-occurrence/respond to incident (e.g. booming, closing dock gates):		
Release likely to reach Median line Yes / No: Shore Yes / No If YES approx. location / time:		
Photographs taken: Yes / No	Samples taken for Analysis: Yes / No	
Part 3: Weather Conditions		
Wind Speed (knots):	Wind Direction (0-360^0):	
Beaufort Scale (1-12):	Wave Height (metres):	
Weather Conditions:		
Tide: Ebb / Flood:	Sea State:	
High Tide Time:	Swell:	
Part 4: Spill Treatment Request		
Request to use oil spill treatment product. Yes / No (if Yes fill in remainder of Part 4)	Name and Type:	
Volume:	(If dispersant) last tested for efficacy when?	
Regulatory Contacts Natural Resources Wales (NRW) Coastguard CGOC		
Send completed form to:		