LBA PARTIAL DECOMMISSIONING PROJECT

LBA PARTIAL DECOMMISSIONING ENVIRONMENTAL APPRAISAL

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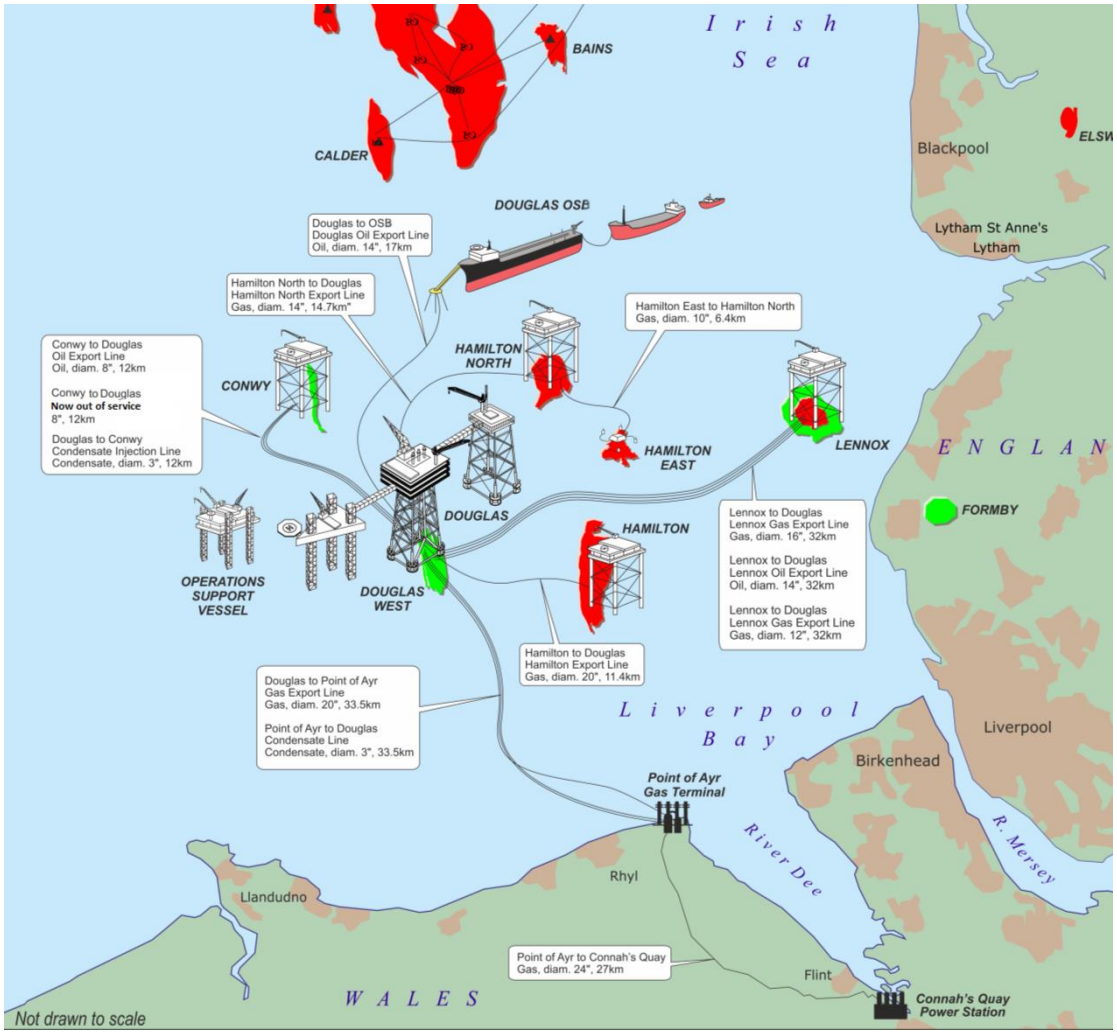
LIVERPOOL BAY ASSET

PARTIAL DECOMMISSIONING ENVIRONMENTAL APPRAISAL

Consultation Draft



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GLOSSARY

Abbreviation	Explanation
%	Percentage
”	Inch
<	Less than
°C	Degrees Celsius
°	Degrees
µm	Micrometre(s)
AIS	Automatic Identification System
AL	Action Level
ALARP	As Low As Reasonably Practicable
AONB	Areas of Outstanding Natural Beauty
As	Arsenic
ASSI	Area of Special Scientific Interest
BAC	Background Assessment Concentration
BDL	Below Detection Limit
BEIS	Department for Business, Energy & Industrial Strategy
BSH	Broad Scale Habitats
CAF	Compressed Asbestos Fibre
CCS	Carbon Capture and Storage
Cd	Cadmium
CD	Chart Datum
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEMP	Coordinated Environmental Monitoring Programme
CH_4	Methane
CMAAP	Corporate Major Accident Prevention Policy
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPI	Carbon Preference Index
Cr	Chromium
CRA	Collision Risk Assessment
cSAC	Candidate SAC
CSQG	Canadian Sediment Quality Guidelines for the Protection of Aquatic Life
Cu	Copper
dB	Decibel

Abbreviation	Explanation
DDC	Dropdown Camera
DESNZ	Department for Energy Security and Net Zero (previously DECC, merged into BEIS in 2016)
DP	Douglas Platform
DP(a)	Decommissioning Programme
DP(b)	Directional Positioning
DW	Douglas Wellhead
DSV	Diving Support Vessel
E	East
EA	Environmental Appraisal
EBS	Environmental Baseline Survey
EC	European Commission
EL	Elevation
EMS	Environmental Management System
ENVID	Environmental Impact Identification
ERL	Effects Range - Low
ESAS	European Seabirds at Sea
EU	European Union
EUNIS	European Nature Information System
FOCI	Features of Conservation Interest
GB	Great Britain
GCR	Geological Conservation Review
H_2S	Hydrogen Sulphide
HC	Heritage Coasts
Hg	Mercury
HH	Hamilton Platform
HLV	Heavy Lift Vessel
HN	Hamilton North Platform
HSE IMS	Integrated Management System
HSEQ	Health, Safety, Environment and Quality
ICES	International Council for the Exploration of the Sea
INNS	Invasive Non-native Species
ISO	International Organization for Standardization
IUCN	International Union for the Conservation of Nature

Abbreviation	Explanation
Kg	Kilogramme
Km	Kilometer
JNCC	Joint Nature Conservation Committee
JTEPS	Joint Tactical Exercise Planning Staff
LAT	Lowest Astronomical Tide
LBA	Liverpool Bay Asset
LD	Lennox Platform
LNR	Local Nature Reserves
LSE	Likely Significant Effect
m	metres
MARPOL	International Convention for the Prevention of Pollution from Ships
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MNR	Marine Nature Reserves
MoD	Ministry of Defence
MPA	Marine Protected Area
m/s	Metres per second
MU	Marine Unit
MWS	Marine Warranty Surveyor
N	North
N_2O	Nitrous Oxide
N/A	Not Applicable
NE	Northeast
Ni	Nickel
NMRW	National Monument Register for Wales
NNR	National Nature Reserves
NO_x	Nitrogen Oxides
NORM	Naturally Occurring Radioactive Materials
NP	National Park
NUI	Normally Unattended Installation
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OSB	Oil Storage Barge
OSPAR	Oslo-Paris Convention
P&A	Plug and Abandon / Plugging and Abandonment

Abbreviation	Explanation
PAH	Polycyclic Aromatic Hydrocarbon
Pb	Lead
PDP	Partial Decommissioning Programme
PEL	Probable Effect Levels
PLEM	Pipeline End Manifold
Pr/Ph	Pristane and/or Phytane
PSD	Particle Size Distribution
RAF	Royal Air Force
rMCZ	Recommended Marine Conservation Zones
RSPB	Royal Society for the Protection of Birds
RSR	Radioactive Substance Regulation
RWE	RWE Renewables
S	South
SAC	Special Area of Conservation
SCI	Sites of Community Importance
SE	Southeast
SE(b)	Standard Error
SFF	Scottish Fishermen's Federation
SMA	Special Management Area
SMRU	Sea Mammal Research Unit
SO_x	Sulphur Oxides
SOSI	Seabird Oil Sensitivity Index
SPA	Special Protection Area
SSBV	Subsea barrier valve
SSE	South-southeast
SSSI	Sites of Special Scientific Interest
SW	Southwest
Te	Tonnes
TEL	Threshold Effects Level
THC	Total Hydrocarbon Content
T&S	Transportation and Storage
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
VOC	Volatile Organic Compounds

Abbreviation	Explanation
W2W	Walk to Work
Zn	Zinc

1.0 NON TECHNICAL SUMMARY

1.1 Scope

This Environmental Appraisal (EA) report documents the environmental and social impact assessment carried out in support of the proposed Liverpool Bay Assets (LBA) Partial Decommissioning Programme (PDP). The PDP is to facilitate repurposing of the LBA into a Carbon Dioxide Transportation and Storage project, as part of the HyNet North West project, aimed to unlock a low carbon economy for the North West of England and North East Wales. Figure 1-1 provides the overview of the LBA Partial Decommissioning Programme (PDP).

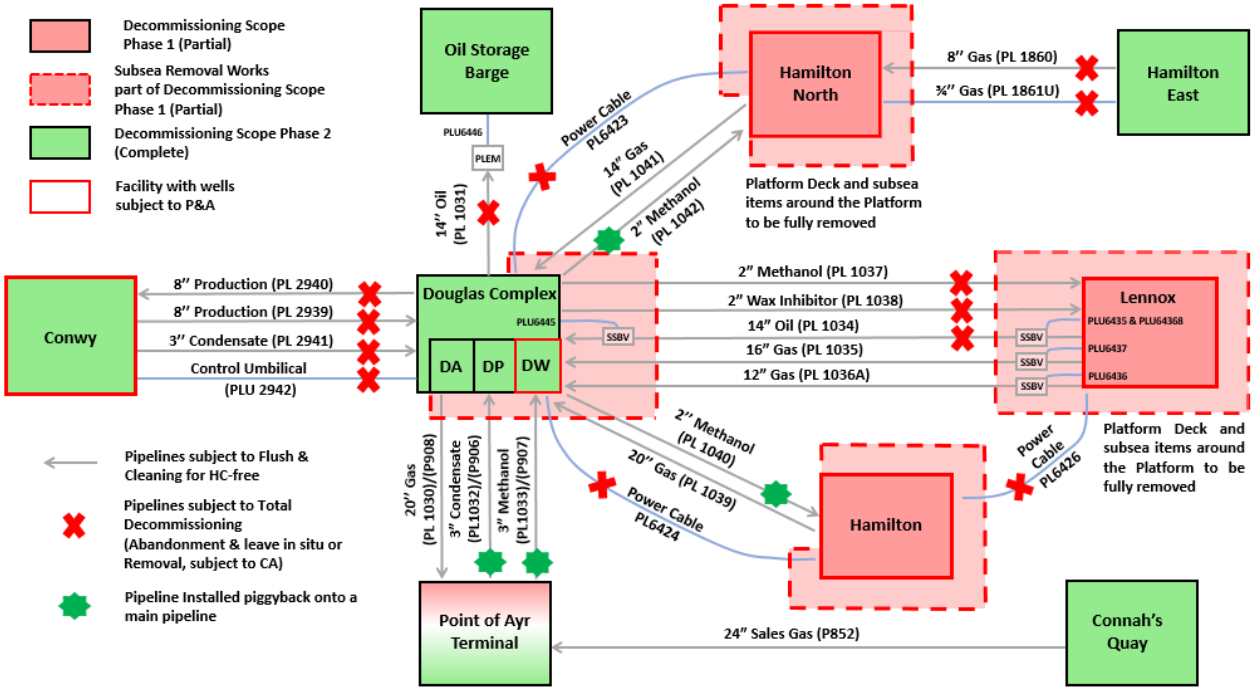


Figure 1-1: LBA Decommissioning Schematic

The LBA includes the following facilities:

- Douglas Complex
- Satellite Platforms (Lennox, Hamilton, Hamilton North)
- Hamilton East Subsea Field
- Oil Storage Barge
- Conwy Platform
- Offshore Pipelines
- Subsea Facilities
- Onshore Pipeline
- Point of Ayr onshore Gas Plant
- Connah's Quay Gas Reception Facility

This EA is focused on the PDP of following facilities only, identified as mandatory for the repurposing of the LBA as part of the HyNet North West project:

- Topsides removal of the Satellite Platforms (Lennox, Hamilton, Hamilton North)
- Platform Wells – Plug and Abandonment (P&A) (Douglas, Hamilton, Hamilton North and Lennox)

- Removal of expansion spools, cables, umbilicals and exposed stabilisation features (mattresses and grout bags) in the near platform area (at Douglas, Hamilton, Hamilton North and Lennox), which do not meet the 0.6metres (m) depth of burial criterion.

Further separate Decommissioning Programmes (and respective EAs, environmental permits & consents as required) will cover the following remaining facilities as part of Liverpool Bay Asset and out of the scope of this EA:

- Oil Storage Barge (unless alternative re-use options are found to be viable and more appropriate)
- Conwy Platform (Jacket, Topsides, Wells, and Pipelines)
- Douglas Production Platform
- Douglas Accommodation Platform
- Douglas Wellhead Platform
- Hamilton East Subsea Field (subsea well and integral protection structure)
- Offshore Pipelines
- Subsea Umbilicals
- Subsea Flexible Lines
- Subsea Valves and Components

The onshore facilities such as pipelines, Point of Ayr Gas Plant, and Connah's Quay Gas Reception Facility are not subject to this partial DP (as not covered by OPRED) and will be decommissioned in accordance with the separate environmental permits and consents, as required.

1.2 Baseline Environment

An overview of the key environmental and societal features in the vicinity of the LBA subsea structures that may be affected by the proposed decommissioning works is provided in Table 1-1. This information has been compiled from a number of published sources as well as data collected during several surveys undertaken in the LBA Field Area in preparation for the proposed decommissioning work.

Table 1-1 Summary of Environmental and Societal Features in the Vicinity of the LBA Subsea Structures

Feature	Description
Physical Environment	
Location	Liverpool Bay Asset is located in the East Irish Sea, in close proximity to the Lancashire, Merseyside and North Wales coastlines, in blocks 110/13a (Hamilton and Hamilton North), 110/13b (Douglas and Douglas West), 110/15a and 110/14c (Lennox), 110/14a (Hamilton East) and 110/12a (Conwy).
Bathymetry	Seabed formations within Liverpool Bay are predominantly characterised by sand ribbons of heights less than 30 cm and sand wave fields with a height of less than 2 m with lengths between 10 m and 20 m. Less frequently, individual sand waves can occur with heights of up to 12 m. Other sand dominated bedforms range from tidal-parallel sand ribbons to larger transverse barchan-type sand waves and extensive sand patches with smaller sandwaves.
Seabed	Sediment types within LBA area vary from course to sandy gravels, and gravelly sand to sand. The main habitat type identified is classified as 'Offshore circalittoral coarse sediment' (EUNIS A5.1). Water depths across Liverpool Bay are generally less than 50 m and the seabed is essentially flat and featureless with no discernible bedforms.

Feature	Description
	Seabed formations within Liverpool Bay are predominantly characterised by sand ribbons of heights less than 30 cm and sand wave fields with a height of less than 2 m with lengths between 10 m and 20 m.
Oceanography	Currents in Liverpool Bay are complicated by the influence of the river flows into the bay. To the north of Liverpool Bay, the tidal currents are predominantly east to west offshore but in more coastal waters the direction changes to north-south. Current speed varies from between 0.3 m/s during neap tides to 1.0 m/s during spring tides in the Lune Channel and around Shell Flats where there is a low residual anti-clockwise current (CSFA, 2007). The strength of the current can be very location specific. The tidal range in Liverpool Bay is relatively high with an average spring tidal range of 8.4 m and at the Douglas installation it ranges from between 6.0 m and 7.0 m during the spring tides and 3.0 – 4.0 m during neap tides (ABPmer,2023). Tidal currents to the east of the Isle of Man are the weakest at less than 0.35 metres per second (m/s), where tidal waves originating from the North Channel and the St Georges Channel meet. The strongest currents in the area occur to the north-west of Anglesey and to the north of the Isle of Man where currents in excess of 2 m/s may occur for up to 40% of the time (ABPmer, 2023; DECC 2009). Sediment transport is predominantly by wave and tidal forces rather than storm surges (nPower Renewables, 2007).
Meteorology	Wind direction and velocity in Liverpool Bay are variable throughout the year. The prevailing winds are from the south-west and west with winds from the east being least frequent. Wind strength varies across seasons with the strongest winds of greater than 12m/s occurring most frequently during winter. During this period the gales occur predominantly from the north-west. During the summer months, wind strengths are at their weakest with winds of less than 7 m/s (ABPmer, 2023).
Biological Sensitivities	
Marine Protected Areas (MPAs)	There are a number of offshore protected areas present in the East Irish Sea (Figure 6-2). Liverpool Bay SPA extension encompass 82,481 ha, an increase of 48.4% from the previous SPA, with the new area now including the Douglas complex and both Hamilton and Lennox NUIs. Other sites that are within 40 km are: • Special Protection Areas (SPAs)**:** Liverpool Bay/ Bae Lerpwl; Anglesey Terns / Morwenoliaid Ynys Môn; The Dee Estuary; Ribble and Alt Estuaries; Mersey Narrows and North Wirral Foreshore; Traeth Lafan/ Lavans Sands, Conwy Bay. (JNCC 2022) • Special Areas of Conservation (SACs): Shell Flat and Lune Deep; Y Fenai a Bae Conwy / Menai Strait and Conwy Bay; Dee Estuary / Aber Dyfrdwy; Great Orne's Head/ Pen y Gogarth; Sefton Coast. (JNCC 2023) • Marine Conservation Zones (MCZs): Fylde; West of Walney. (JNCC 2019; NE 2023)
Plankton	Plankton forms the primary basis of the marine food chain. The annual cycle of Plankton in Liverpool Bay is variable but usually comprises of a spring peak in phytoplankton followed by a corresponding peak in zooplankton followed by a decrease in numbers

Feature	Description
	during the summer. There may be a smaller peak in the autumn before decreasing to lowest densities during the winter months. The peaks during the spring may be up to a month later (April and May) than those that occur in the North Sea. Overall numbers of plankton in Liverpool Bay are lower than elsewhere (Kennington & Rowlands, 2006; Irish Sea Study Group, 1990). The phytoplankton assemblage of the eastern Irish Sea is dominated by diatoms and dinoflagellates. In the spring, diatoms such as *Chaetoceros* spp., *Thalassiosira* spp. and *Lauderia borealis* are abundant. The smaller autumn peak consists mainly of *Biddulphia sinensis*. Diatom blooms consisting mainly of *Phaeocystis pouchitti* often develop in late spring or early summer in Liverpool Bay. Later in the summer, the dinoflagellate *Gyrodinium aureolum* that produces "red tides" and the luminescent dinoflagellate *Noctiluca scintillans* may occasionally form blooms in the area. Rapid bloom development, particularly of *P. pouchitti* can result in oxygen depletion in the water column (Kennington & Rowlands 2006; DECC, 2016). The zooplankton community is dominated by crustaceans, principally copepods such as *Pseudocalanus elongatus*, *Temora longicornis* and *Acartia* clausi among the most numerous (Kennington & Rowlands 2006). Larger calanoids are also important components of the community, with the warmer water *C. helgolandicus* more abundant than *C. finmarchicus*. Abundant jellyfish species in the area include *A. aurita, C. hysoscella, C. lamarcki* and *R. octopus* (Pikesley et al. 2014; DECC, 2016).
Benthos	In general, polychaete and cockle communities dominate much of the central intertidal area of Morecambe Bay and form the basis of an extensive fishery. Numerous surveys carried out in the area have broadly confirmed previous understanding of the habitats and communities, these being largely sands containing variants of the “shallow Venus” community, interspersed with sparser polychaete and amphipod communities, often with dense heart urchins *Echinocardium cordatum*, in more mobile sandy areas, and with richer pockets of gravelly or muddy sediments (DECC, 2016). Beyond the 20m contour in Liverpool Bay, they found a *Microcheirus-Pagurus* assemblage dominated by starfish *Asterias rubens*, sole *Solea solea* and dragonet *Callionymus lyra*, with the thickback sole *Microcheirus variegatus* and the hermit crab *Pagurus prideaux* as important discriminating species; a single site north east of Llandudno was dominated by dead man’s fingers *Alcyonium digitatum*, *A. rubens* and *L. limanda*, with high catches of species typical of hard or stony ground such as the anemone *Metridium senile* (*Alcyonium* assemblage) (DECC, 2016). Fine sand communities are dominated by bivalves with *Abra albra*, *Donax vitatusi, Spisula subtruncata* and *Fabulosa fabula* being abundant. The crustaceans *Bathyporeia guilliamsoniana* and the polychaete *Nephtys cirosa* may also occur in relatively large numbers. Wide-scale surveys undertaken in 2008 and 2022 across the Irish Sea recorded over 450 species of which the brittle star (*Amphiura filiformis)* was the most abundant species. Bivalve (*Kurtiella bidentata)*, the polychaetes (*Pectinaria koreni),* trumpet worm (*Scalibregma inflatum)* and *Alba albra* werewidespread and relatively abundant (Hartley Anderson, 2009). A subtidal benthic survey carried out in 2022 recorded significant amount of species including tube worm *Spirobranchus triqueter,* Nemertea and *Kurtiella bidentata.* The epifaunal community was characterised by relatively high numbers of the common brittle

Feature	Description
	star *Ophiothrix fragilis* and Actinaria, with the latter being also the most frequently occurring taxon (RPS, 2022).
Fish	The Irish Sea contains a wide range of both pelagic (mid water), demersal (bottom water) and shellfish species. The shallow soft-bottomed waters of Liverpool Bay are dominated by demersal fish species such as plaice and dab. Shellfish species present in Liverpool Bay area are dominated by brown shrimp and numerous other species such as cockles and common mussel. Pelagic species are less numerous in Liverpool Bay than demersal species or shellfish although herring, mackerel, sprat, scad and sandeels are all present in the East Irish Sea. Fish species spawning within the Conwy area include cod and plaice (Block 110/12 only), whiting, sole, sprat, plaice and *Nephrops,* ling, anglerfish, sandeel and mackerel. Skates and rays (Chondrichtyan fishes or Elasmobranchs) are an important part of the Irish sea ecosystem and several species may be found within the vicinity of Conwy (Coull et al., 1998; Ellis et al., 2012). Rare or protected species present in the Liverpool Bay area include basking shark (*Cetorhinus maximus*), common goby (*Pomatoschistus microps*), sand goby (*Pomatoschistus minutus*), Allis shad (*Alosa alosa*) and Twaite shad (*Alosa fallax*). Also present in the area are salmon (*Salmo salar*), river lamprey (*Lamperta fluviatilis*), sea lamprey (*Petromyzon marinus*) and smelt or sparling (*Osmerus eperlanus*) (Lockwood, 2005).
Seabirds	The East Irish Sea and its adjacent coastlines are of particular importance for wintering seabirds. Liverpool bay hosts internationally important populations of red-throated divers (*Gavia stellata*) and common scoter (*Melanitta nigra*). Seabird sensitivity in Block 110/13 (Douglas, Hamilton and Hamilton North) is recorded as medium and low in the months of May to August. September, October and December have very high sensitivity with January to April and in November having extremely high seabird sensitivity. (JNCC, 2016) Seabird sensitivity in Block 110/15 (Lennox) is recorded as low in the months of June and July. August, September and April have high sensitivity with October to March having extremely high sensitivity. (JNCC, 2016) Kittiwakes (*Rissa tridactyla*) are also known to nest on the LBA facilities. (RSK biocensus, 2023)
Marine Mammals	Within the Eastern Irish Sea, harbour porpoise (*Phocoena phocoena*) bottlenose dolphin (*Tursiops truncates*), and common dolphin (*Delphinus delphis*) are the three most frequently recorded cetaceans (Reid *et al*., 2003). Of these three species the harbour porpoise is the most frequently recorded. They occur throughout the year with most sightings occurring in the summer months of July to September. Harbour porpoise are widely distributed across the whole Eastern Irish Sea but relatively higher numbers have been recorded north of Blackpool (Reid *et al*. 2003). Recent analysis of survey data collected in the Irish Sea indicates that densities of harbour porpoise are lowest in the nearshore waters of Liverpool Bay, including those around Douglas and OSB, with up 0.75/km^2 being recorded compared to up to 1.5/km^2 recorded to the west of Anglesey (Paxton & Thomas 2010). Within Liverpool Bay densities of bottlenose dolphins are highest along the North Wales coast with up to 5 individuals/km^2 compared to less than 1 or 0.1 per km^2 elsewhere including around the Douglas and OSB (Paxton & Thomas 2010). They are most

Feature	Description
	frequently recorded in the summer months of July to September. Table 6-9 summarises sightings of cetaceans in Liverpool Bay. Grey seals (*Halichoerus grypus)* and harbour seals (*Phoca vitulina)* are both resident in UK waters and are listed under Annex II of the EU Habitats Directive (92/43/EEC as amended by 97/62/EC). The most recent synoptic census of the principal grey seal breeding sites in Orkney, the Inner and Outer Hebrides, the Firth of Forth and sites in eastern England was carried out in 2019 and recorded an estimated production of 67,850 pups born throughout the UK in 2019, out of which 80% were in Scotland and 15% in England. The overall UK grey seal pup production increased by 1.5% between 2016 and 2019. Growth was mainly limited to the North Sea colonies along the east coast of Scotland and England (SCOS, 2021) Counts for harbour seal population in 2020 and 2021 confirm that the population has declined. The total count for the sites between Donna Nook in Lincolnshire and Scroby Sands in Norfolk, has declined by approximately 38% compared to the mean of the previous five years. Populations along the east coast of Scotland and in the Northern Isles have generally declined since the early 2000s. The recorded declines have differed in intensity but in all areas the current population size is at least 40% below the pre-2002 level. Populations in North Coast & Orkney SMU and in the Tay and Eden SAC are continuing to decline. Although continued declines are not evident in Shetland or the Moray Firth, there is no indication of recovery (SCOS, 2021)
Societal Aspects	
Fisheries	The LBA project area lies within International Council for the Exploration of the Sea (ICES) rectangles 35E6 and 36E6 characterised by spawning and nursery grounds for the following fish species: queen scallops, whelks, bass, thornback ray, lobster There was a fishing effort of *c.*523 days in ICES rectangle 36E6 in 2021, considered to be moderate, constituting *c.* 0.52% of the overall fishing effort in the UK (Scottish Government, 2022). Shellfish species tend to dominate in terms of weight and value followed by demersal species, whilst landings of pelagic species were very low (MMO, 2022). The primary gear type used in the area are dredges and traps with some trawling.
Shipping	Liverpool is one of the major ports in the UK, handling 31 million tonnes of cargo annually (DECC, 2016). Shipping densities in the study area vary from low to moderate to high. In total 27 shipping lanes were identified across the whole LBA area. Amongst shipping lane traffic, cargo vessel tracks dominated, and account for between 74% (Hamilton North) and 71% (OSB) of all shipping lane tracks within the five 10 nm study areas. Tanker vessel tracks in the study areas were consistently much lower than cargo, at between 20% (Douglas Complex) and 16% (OSB) of shipping lane traffic (Xodus, 2020).
Oil and Gas Activity	The level of existing oil and gas activity in the area is high (see Figure 6-19). The Morecambe South DP-3 platform is located approximately 31,7 km to the north from Lennox platform.

Feature	Description
Military activities	There are four Royal Air Force (RAF) bases in the region however there is no Royal Navy or RAF practice area in Liverpool Bay. Blocks 110/13 and 110/15 comprise Ministry of Defence (MoD) training grounds. Joint Warrior exercises are planned and conducted by the MoD Joint Tactical Exercise Planning Staff (JTEPS) and generally take place every spring and autumn. (Exercise Joint Warrior, 2021)
Wrecks	There are many wrecks present in the Liverpool Bay area due to the history of high density shipping and the shallow water depth. Within the area bounded by latitude 53° 30'N - 53° 40'N and longitude 03° 00'W - 03° 36'W, there are 74 charted wrecks, 11 anchors and 232 obstructions that have been identified. Two wrecks are recognised as being particularly important (Gale and Fenwick, 1996). The *Mary* lies off the Skerries, Anglesey and is designated as an historic wreck by the Department of National Heritage. The *Resurgam* was the world's first practical working submarine and is located off the North Wales coast.
Cables	A number of cables and pipelines exist in the eastern Irish Sea. No cables and pipelines cross the location except those associated with Eni UK Limited existing facilities.
Offshore Windfarms, Aggregate and Dredging Activity	Number of aggregate areas and disposal sites are also present (see Figure 6-20), namely the Liverpool Bay Aggregate Exploration and Production sites and Hilbre Swash production site. There are eleven current windfarms are present in the LBA region and five windfarms are planned, currently undergoing application/licensing process (see Table 6-12(a) in the 46km radius of the proposed works. In addition, navigational dredging takes place approximately 6 km to the southeast of the LBA project area at the Mersey Approach Channel.
Onshore Communities	The Liverpool Bay area hosts a combination of large industrial centres and relatively remote coastal areas. Infrastructure to support the decommissioning activities could be available either locally or from other UK or European ports.

1.3 Impact Assessment

In order to assess significance of potential impacts associated with the LBA Partial Decommissioning Programme, the project followed the ENI Procedure for the Identification of Environmental Aspects (HSE IMS B1-SYS-03 rev. 01) and ENI UK HSE Risk Management Procedure (UK HSE IMS B1-SYS-01 rev. 03).

Potential environmental and societal impacts arising from the PDP have been assessed during two sessions:

- Phase 1 Environmental Impact Identification (ENVID) – this session assessed the topsides removal required to enable the CCS development [1023D0BFRV09505], was carried out on the 11th of July 2022.
- Environmental Risk Assessment review – this session assessed the additional subsea removal scopes required to enable the CCS installation, was carried out on the 25th of May 2023.

This method of evaluation was applied to all activities and related aspects identified as having the potential to interact with the environment and to cause environmental or societal impacts. Significance was classified as Low, Medium, Medium-High and High. Suitable controls and mitigation measures were then captured such that the potential impacts would be avoided or reduced to as low as reasonably practicable (ALARP).

The potential impacts were then reassessed to determine if the overall significance had been reduced. This process enabled identification of aspects thought to be potentially significant and aspects that could be scope out; therefore, focusing the need for further assessment.

The scoping exercise identified that there were no aspects considered to have high or medium-high impact to identified receptors. The following aspects were considered to present a medium impact to at least one receptor and required comprehensive assessment:

- Seabed disturbance
- Although environmental impact assessment exercises demonstrate decommissioning activities are not expected to cause significant impact on seabirds using offshore facilities as artificial nesting sites. However due to fact Annex 1 birds being one of the reasons Liverpool Bay site being qualified as an SPA, some further assessment and mitigation methods been carried out.

All other aspects were identified, which following implementation of mitigation measures described in this section have a low significance, are not considered to require further assessment:

- Underwater noise
- Physical presence
- Marine Discharges
- Energy use and atmospheric emissions
- Waste generation
- Unplanned events

Due to LBA Field Area location within the network of MPAs, the further assessment includes sections on the potential impacts to integrity of the site / Conservation Objectives from the identified aspects. Cumulative effects, in-combination impacts and transboundary issues were all considered to have low significance and additional description has been provided to explain this conclusion.

Mitigating measures for each aspects were considered, including industry standard operating procedures, company management processes and project implemented controls. The following measures will be adopted to ensure that seabed disturbance and its impacts are minimised to as low as reasonably practicable:

- Removals will be planned, managed and implemented in such a way that seabed disturbance is minimised.
- All work will be undertaken under a marine license or any other applicable permits and consents, as required.
- The duration of vessels in the field, particularly using Directional Positioning, will be minimised as much as possible.

Post-disturbance recovery of the seabed and associated biota is dependent both on the strength of the seabed soils and the ability of the hydrological regime to rework disrupted sediments and return the seabed to its original contours. The seabed in the proposed operations area is predominantly composed of unconsolidated sand and gravel and is therefore amenable to reworking. The shallow water depth in the area allows wave action to combine with tidal currents to generate relatively high shear strengths at the seabed and this is likely to lead to rapid reworking of the affected sediments. Given the strong current regime in the area, transport of larvae and juvenile organisms into the affected area and re-colonisation of the sediments is also expected to be relatively rapid.

For each of the impacts identified as having potential for residual risk rated medium, additional commentary has been included in Section 8.0 Environmental Assessment.

1.4 Conclusions

The development of the Project has been informed by ongoing appraisal of the environmental impacts and risks posed by options under consideration. The environmental appraisal has been based on an understanding of the baseline environment established from multiple web-based sources, scientific papers and seabed surveys.

Comprehensive identification of potential impacts from the proposed PDP was achieved through the Environmental Risk Assessment, the output of which was used to scope the requirements for further detailed impact assessment. The scoping exercise identified that there were no aspects considered to have high or medium-high impact to identified receptors. The following aspects were considered to present a medium impact to at least one receptor and required comprehensive assessment:

- Seabed disturbance

Annex 1 birds Due to LBA Field Area location within the network of MPAs, the further assessment includes sections on the potential impacts to integrity of the site / Conservation Objectives from the identified aspects. Cumulative effects, in-combination impacts and transboundary issues were all considered to have low significance and additional description has been provided to explain this conclusion.

The following measures will be adopted to ensure that seabed disturbance and its impacts are minimised to as low as reasonably practicable:

- Removals will be planned, managed and implemented in such a way that seabed disturbance is minimised.
- All work will be undertaken under a marine license.
- The duration of vessels in the field, particularly using DP, will be minimised as much as possible.

In order to ensure that the environmental and societal impact of the decommissioning activities remains as low as reasonably practicable, ENI will adhere to their in-house management procedures, including but not limited to contractor management, vessel inspections and audits and the legal obligation to report any accidental discharges and emissions which may occur.

Based on the findings of this EA, including the identification and subsequent application of appropriate mitigation measured and Project Management according to ENI's Health, Safety, Environment and Quality (HSEQ) Policy and Environmental Management System (EMS), it is considered that the proposed PDP can be executed with no significant impact to the environmental or societal receptors within the UKCS or internationally.

2.0 INTRODUCTION

2.1 LBA Field Area Description

Liverpool Bay Asset is located in the East Irish Sea, in close proximity to the Lancashire, Merseyside and North Wales coastlines, in blocks 110/13a (Hamilton and Hamilton North), 110/13b (Douglas and Douglas West), 110/15a and 110/14c (Lennox), 110/14a (Hamilton East) and 110/12a (Conwy).

The Offshore Installations present in the Liverpool Bay Asset are the following:

- Douglas Complex, including a wellhead platform (DW), a central production platform (DP) and an accommodation platform (DA)
- Lennox Platform: NUI oil and gas platform (LD)
- Hamilton Platform: NUI oil and gas platform (HH)
- Hamilton North Platform: NUI oil and gas platform (HN)
- Hamilton East subsea well and protection structure (HE)
- Conwy Platform: NUI oil and gas platform (CY)

Offshore operations are centred on the Douglas complex – a three-platform facility that monitors and controls the development's four unmanned satellite platforms at Lennox, Hamilton, Hamilton North, and Conwy (Figure 2-1).

Produced oil is exported from Douglas via a sub-sea pipeline to the Oil Storage Barge (OSB), which is located 17km north of Douglas. Produced gas was exported from Douglas via a sub-sea pipeline to the onshore terminal at Point of Ayr. It was then sent by onshore pipeline to Uniper's combined cycle gas turbine power station at Connah's Quay. However, the Sales Gas from Point of Ayr Gas Terminal ended on 30th June 2023.

Hamilton East field was developed by a single subsea production well with the gas exported to the Hamilton North.

A network of subsea power cables provide power to the Satellite Platforms from Douglas Complex. Power cables are currently trenched with a natural back-fill after the installation.

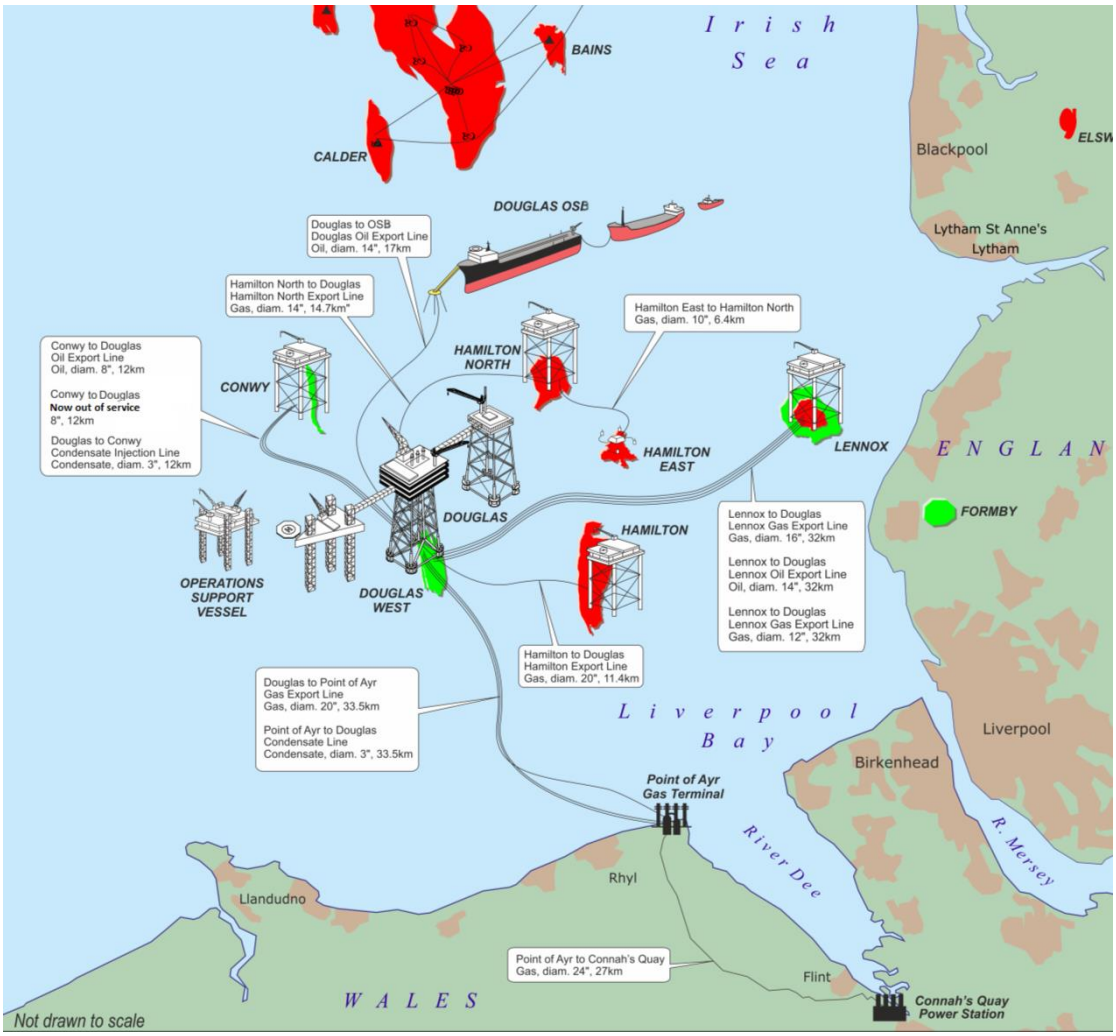


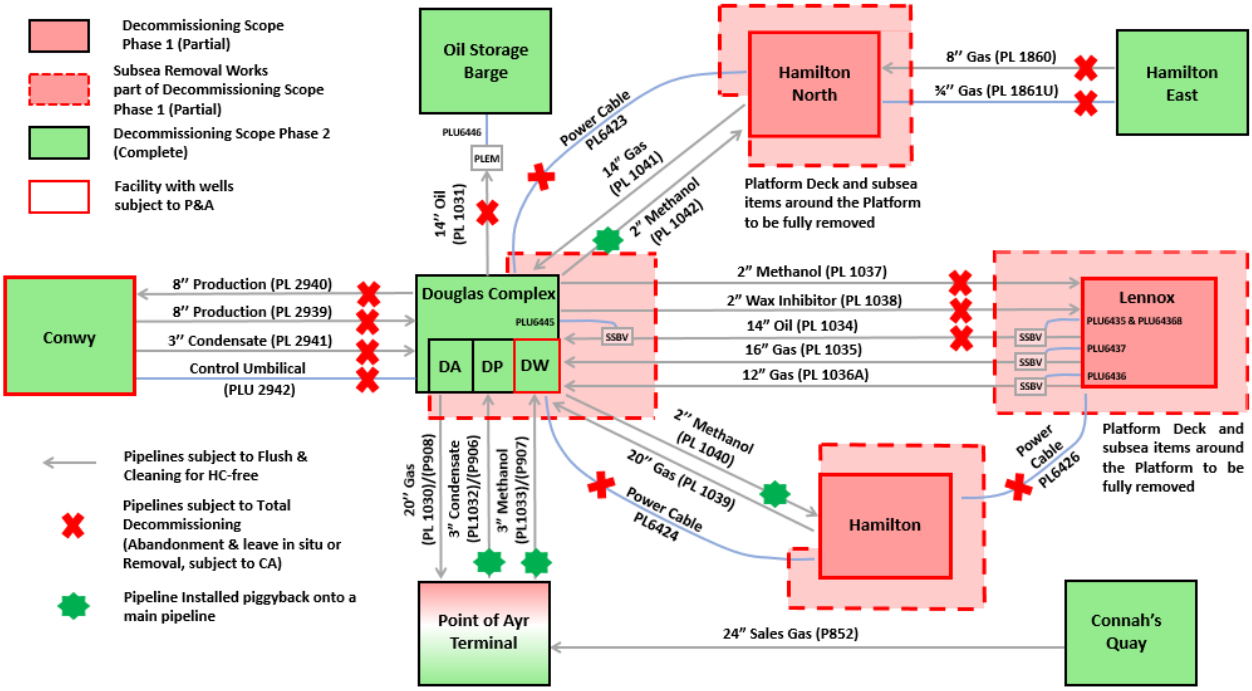
Figure 2-1: Liverpool Bay Asset Facilities Schematics

2.2 Scope of the Environmental Appraisal

The purpose of this Environmental Appraisal (EA) report is to document the potential for, and significance of, environmental and societal impacts resulting from the proposed LBA Partial Decommissioning Programme (PDP) of the following facilities, identified as mandatory for the repurposing of the Liverpool Bay Asset as part of the HyNet North West project:

- Topsides removal of the Satellite Platforms (Lennox, Hamilton, Hamilton North)
- Platform wells P&A (Douglas, Hamilton, Hamilton North and Lennox)
- Removal of expansion spools, cables, umbilicals and exposed stabilisation features (mattresses and grout bags) in the near platform area (at Douglas, Hamilton, Hamilton North and Lennox), which do not meet the 0.6m depth of burial criterion

The EA will also summarise the proposed mitigations and control measures required to minimise the identified environmental and social impacts to as low as reasonably practical. Figure 2-2 provides the overview of the LBA offshore facilities subject partial decommissioning.



2.3 Brief Facilities Description

The topsides to be decommissioned are provided in Table 2-1 and described further in the subsections below.

Table 2-1: Topsides (1)

Topsides									
Name	Facility Type	Location (WGS84)		Topside		Jacket Weight			
				Weight to be removed (Te(2))	No of modules	Weight (Te)	Nr. of legs	Nr. of piles	Weight of piles (Te)
Hamilton Platform (HH)	Topsides Jacket Platform	53°33.958 N	03°27.270' W	502	1	747	4	4	406
Hamilton North Platform (HN)	Topsides Jacket Platform	53°38.782' N	03°28.686' W	497	1	713	4	4	633
Lennox Platform (LD)	Topsides Jacket Platform	53°37.881' N	03°10.595' W	1,194	1	451	4	4	425

1) The overall weight to be removed represents the complete weight of the Topsides. The Jackets and Piles are not part of this Decommissioning Programme.
2) Tonnes (Te)

2.3.1 Hamilton (HH) Platform

Hamilton (HH) platform was installed in 1995 in a water depth of about 25.8 m lowest astronomical tide (LAT). Its substructure is a skirtpile type steel jacket with four (4) legs. Jacket base and top dimensions are 14 m x 10 m and 12 m x 10 m, respectively.

The HH platform topside is composed of four decks:

- Weather Deck El. +33.500 m
- Access Platform Deck El. +30.300 m
- Cellar Deck El. +27.000 m
- Underdeck Platform El. +23.500 m

The elevations are referred to Platform Level Datum (+0.00) coinciding with LAT.

The platform foundation is provided by four 60" skirt-piles with penetration depth of 26.4 m for all piles. There are six conductors (20''), two risers (20" & 2"), one 28" caisson and two 10" J-tubes. The topside is composed by a two levels integrated deck (cellar deck and a weather deck) with an underdeck platform, with helipad located on main deck (Figure 2-2).

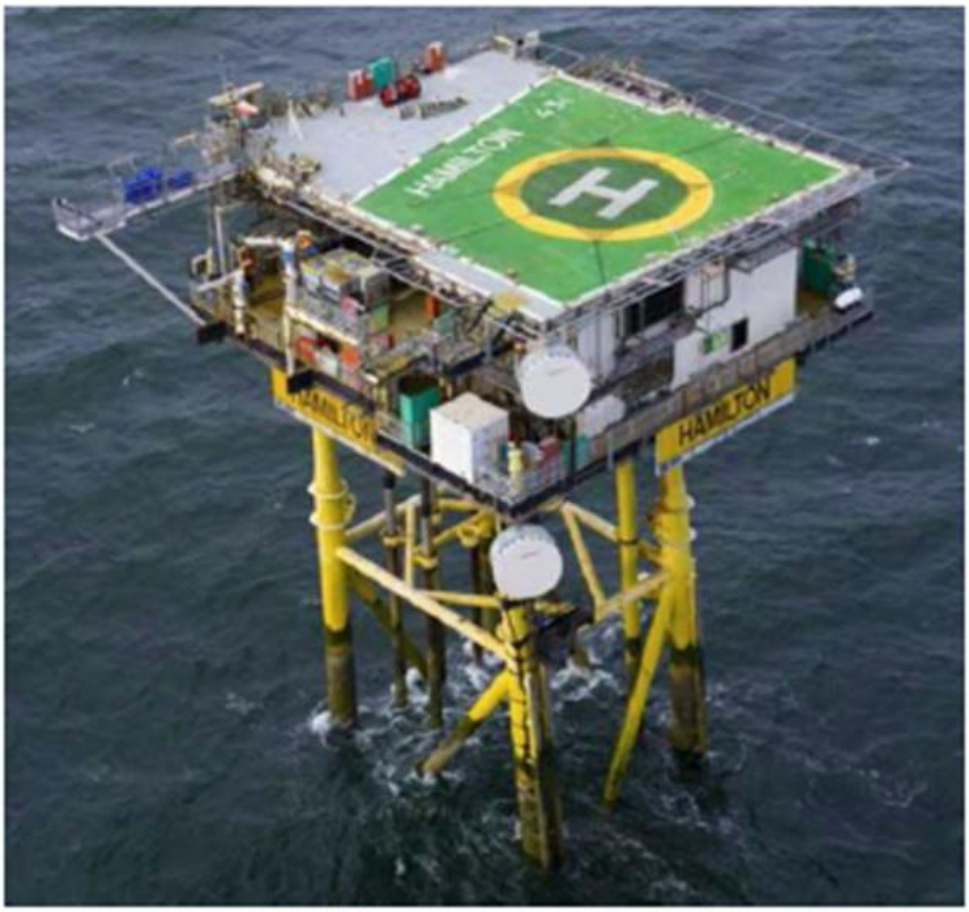


Figure 2-2: Hamilton (HH) Platform Overview

2.3.2 Hamilton North (HN) Platform

The Hamilton North (HN) platform was installed in 1995 in a water depth of about 22.1 m LAT. Its substructure is a skirt-pile type steel jacket with four (4) legs. Jacket base and top dimensions are 14 m x 10 m and 12 m x 10 m, respectively.

The HN platform topside is composed of four decks:

- Weather Deck El. +33.500m
- Access Platform Deck El. +30.300m
- Cellar Deck El. +27.000m
- Underdeck Platform El. +23.500m

The elevations are referred to Platform Level Datum (+0.00) coinciding with LAT. The platform foundation is provided by four 60” skirt-piles with a penetration depth of 24 m for all piles. There are six conductors (20”), two risers (14” and 10”), one 28” caisson and two 10” J-tubes. Topside is composed by a two levels integrated deck (cellar deck and a weather deck) and an underdeck platform, with helipad located on main deck (Figure 2-3).

Figure 2-3: Hamilton North (HN) Platform Overview

2.3.3 Lennox (LD) Platform

The Lennox (LD) platform was installed in 1995 in a water depth of about 7.2 m LAT. Its substructure is a mainpile type steel jacket with four (4) legs. The Jacket base and top dimensions are 16 m x 16 m.

The LD platform topside is composed of four decks:

- Weather Deck El. +35.700m
- Access Platform Deck El. +32,500m
- Cellar Deck El. +29.200m
- Underdeck Platform El. +25.700m

The elevations are referred to Platform Level Datum (+0.00) coinciding with LAT.

The topside is composed by a two levels integrated deck, with helipad located on main deck (Figure 2-4). It provides wellhead and processing facilities, with the separated oil and gas being exported to the Douglas Complex.

Figure 2-4: Lennox (LD) Platform Overview

2.3.4 Subsea Pipelines and Stabilisation Features

The seabed areas surrounding the platforms (subsections 2.3.1, 2.3.2 and 2.3.3) hold several subsea in structures such as pipelines spools, control umbilicals, stainless steel ball valves (SSBV) and cables. These installations and related stabilisation features such as concrete mattresses are summarised in Table 2-2, with evidence of ‘Existing Total Quantities’, ‘Quantities to be removed’ as scope of Partial DP, and ‘Quantities to be retained’ for re-use as scope of CCS project.

Table 2-2: Subsea Pipelines and Stabilisation Features

Pipelines and Stabilisation Features									
Progr. Nr.	**Item**	**Status**	**Burial Status**	**Description**	**Type**	**Existing Total Quantities**	**Quantities to be retained**	**Quantities to be removed**	**Removal Location**
01	**PL1030**	Operating	Buried	20" from Point of Ayr to Douglas	Pipeline section	32,120m	31,935m	130 m	Douglas Complex approach
					Spools			55m	
					Concrete Mattress (6m x 3m each)	26	0	26	
					Grout bags	Unknown	Unknown	Unknown	
02	**PL1032**	Operating	Buried	3" Condensate Pipeline Point of Ayr to Douglas	Pipeline section	32,110m	31,912m	162m	Douglas Complex approach
					Spools			36m	
					Concrete Mattress (6m x 3m each)	11 across PL1032 and PL1033	0	11 across PL1032 and PL1033	
					Grout bags	Unknown	Unknown	Unknown	
03	**PL1033**	Operating	Buried	3" Methanol Pipeline Point of Ayr to Douglas	Pipeline section	32,110m	31,903m	170m	Douglas Complex approach
					Spools			37m	
					Concrete Mattress (6m x 3m each)	11 across PL1032 and PL1033	0	11 across PL1032 and PL1033	
					Grout bags	Unknown	Unknown	Unknown	
04	**PL1034**	Operating	Buried	14" Oil Pipeline Lennox to Douglas	Pipeline section	31,772m	31,273m	228m	Douglas Complex approach
					Spools			135m	
					Concrete Mattress (6m x 3m each)	40 across PL1034 and PL1037	0	14 across PL1034 and PL1037	
					Grout bags	Unknown	Unknown	Unknown	
					SSBV	1	0	1	

					DD-ESV-20002				
					Pipeline section	As above	As above	23m	Lennox Platform approach
					Spools			113m	
					Concrete Mattress (6m x 3m each)	As above	As above	26 across PL1034 and PL1037	
					Grout bags	Unknown	Unknown	Unknown	
					SSBV DD-ESV-20001	1	0	1	
05	**PLU6445**	Operating	Buried	Control Umbilical for PL1034 SSBV	SSBV Control Umbilical	205m	0m	205 m	Douglas Complex approach
					Concrete Mattress (6m x 3m each)	(incl. in PL1034)	(incl. in PL1034)	(inc. in PL1034)	
					Grout bags	Unknown	Unknown	Unknown	
06	**PLU6435**	Operating	Buried	Control Umbilical from SUTU to SSBV (PL1034)	Control Umbilical	3m	0m	3 m	Lennox Platform approach
					Concrete Mattress (6m x 3m each)	(incl. in PL1034)	(incl. in PL1034)	(inc. in PL1034)	
					Grout bags	Unknown	Unknown	Unknown	
07	**PLU6436**	Operating	Buried	Control Umbilical from SUTU for PL1036A SSBV	SSBV Control Umbilical	154m	0m	154 m	Lennox Platform approach
					Concrete Mattress (6m x 3m each)	(inc. in PL1036A)	(inc. in PL1036A)	(inc. in PL1036A)	
					Grout bags	Unknown	Unknown	Unknown	
08	**PLU6437**	Operating	Buried	Control Umbilical from SUTU for PL1035 SSBV	SSBV Control Umbilical	38m	0m	38 m	Lennox Platform approach
					Concrete Mattress (6m x 3m each)	(inc. in PL1035)	(inc. in PL1035)	(inc. in PL1035)	
					Grout bags	Unknown	Unknown	Unknown	
09	**PLU6438**	Operating	Buried	Control Umbilical	SSBV Control Umbilical	129m	0m	129 m	

				from LD Platform to SUTU (LD Area)	Concrete Mattress (6m x 3m each)	(inc. in PL1034 and 1036A)	(inc. in PL1034 and 1036A)	(inc. in PL1034 and 1036A)	Lennox Platform approach
					Grout bags	Unknown	Unknown	Unknown	
					SUTU Subsea Umbilical Termination Unit	1	0	1	
10	**PL1035**	Operating	Buried	16" Gas Pipeline Lennox to Douglas	Pipeline section	31,772m	31,516m	176m	Douglas Complex approach
					Spools			80m	
					Concrete Mattress (6m x 3m each)	17	4	13	
					Grout bags	Unknown	Unknown	Unknown	
					SSBV DD-ESV-20022	1	0	1	
11	**PL1036 Disused**	Non-Operational	Buried	12" Gas Injection Douglas to Lennox	Pipeline section	31,270	30,704m	352m	Douglas Complex approach
					Spools			84m	
					Concrete Mattress (6m x 3m each)	109 across PL1036 and PL1038	15 across PL1036 and PL1038	90 across PL1036 and PL1038	
					Grout bags	Unknown	Unknown	Unknown	
					Pipeline section	As above	As above	40m	Lennox Platform approach
					Spools			90m	
					Concrete Mattress (6m x 3m each)	As above	As above	4 across PL1036 and PL1038	
					Grout bags	Unknown	Unknown	Unknown	
12	**PL1036A**	Operating	Buried	12" Gas Pipeline Lennox to Douglas	Pipeline section	31,424m	31,185m	143m	Douglas Complex approach
					Spools			96m	
					Concrete Mattress (6m x 3m each)	94	83	11	

					Grout bags	Unknown	Unknown	Unknown	
					SSBV LD-ESV-30001	1	0	1	
13	**PL1037**	Operating	Buried	2" Methanol Pipeline Douglas to Lennox (piggyback onto PL1034)	Pipeline section	31,772m	31,273m	228m	Douglas Complex approach
					Spools			135m	
					Concrete Mattress (6m x 3m each)	40 across PL1034 and PL1037	0	14 across PL1034 and PL1037	
					Grout bags	Unknown	Unknown	Unknown	
					Pipeline section	As above	As above	23m	Lennox Platform approach
					Spools			113m	
					Concrete Mattress (6m x 3m each)	As above	As above	26 across PL1034 and PL1037	
					Grout bags	Unknown	Unknown	Unknown	
14	**PL1038**	Operating	Buried	2" Wax Inhibitor Pipeline Douglas to Lennox (piggyback onto PL1036 Disused)	Pipeline section	31,772m	31,206m	352m	Douglas Complex approach
					Spools			84m	
					Concrete Mattress (6m x 3m each)	109 across PL1036 and PL1038	15 across PL1036 and PL1038	90 across PL1036 and PL1038	
					Grout bags	Unknown	Unknown	Unknown	
					Pipeline section	As above	As above	40m	Lennox Platform approach
					Spools			90m	
					Concrete Mattress (6m x 3m each)	As above	As above	4 across PL1036 and PL1038	
					Grout bags	Unknown	Unknown	Unknown	
15	**PL1039**	Operating	Buried	20" Gas Pipeline	Pipeline section	11,207m	10,978m	174m	Douglas Complex approach
					Spools			55m	

				Hamilton to Douglas	Concrete Mattress (6m x 3m each)	29 across PL1039 and PL1040	17 across PL1039 and PL1040	12 across PL1039 and PL1040	
					Grout bags	Unknown	Unknown	Unknown	
16	**PL1040**	Operating	Buried	2" Methanol Pipeline Douglas to Hamilton (piggyback onto PL1039)	Pipeline section	11,207m	10,759m	174m	Douglas Complex approach
					Spools			56m	
					Concrete Mattress (6m x 3m each)	29 across PL1039 and PL1040	17 across PL1039 and PL1040	12 across PL1039 and PL1040	
					Grout bags	Unknown	Unknown	Unknown	
					Pipeline section	As above	As above	52m	Hamilton Platform approach
					Spools			57m	
					Concrete Mattress (6m x 3m each)	As above	As above	As above	
					Grout bags	Unknown	Unknown	Unknown	
17	**PL1041**	Operating	Buried	14" Gas Pipeline Hamilton North to Douglas	Pipeline section	14,300m	14,086m	166m	Douglas Complex approach
					Spools			48m	
					Concrete Mattress (6m x 3m each)	25 across PL1041 and PL1042	18 across PL1041 and PL1042	7 across PL1041 and PL1042	
					Grout bags	Unknown	Unknown	Unknown	
18	**PL1042**	Operating	Buried	2" Methanol Pipeline Douglas to Hamilton North (piggyback onto PL1041)	Pipeline section	14,300m	14,087m	166m	Douglas Complex approach
					Spools			47m	
					Concrete Mattress (6m x 3m each)	25 across PL1041 and PL1042	18 across PL1041 and PL1042	7 across PL1041 and PL1042	
					Grout bags	Unknown	Unknown	Unknown	
19	**PL1860**	Non-operational	Buried	8" Gas Flexible Line	Flexible Line section	6,620m	6,542m	78m	

				Hamilton East to Hamilton North	Concrete Mattress (6m x 3m each)	0	0	0	Hamilton North Platform approach
					Grout bags	Unknown	Unknown	Unknown	
					Flexible Line section	As above	As above	0	Hamilton East approach
					Concrete Mattress (6m x 3m each)	20	20	0	
					Grout bags	Unknown	Unknown	Unknown	
20	**PLU1861**	Operating	Buried	Control Umbilical Hamilton North to Hamilton East	Control Umbilical	6,620m	6,547m	73m	Hamilton North Platform approach
					Concrete Mattress (6m x 3m each)	0	0	0	
					Grout bags	Unknown	Unknown	Unknown	
					Control Umbilical	As above	As above	0	Hamilton East approach
					Concrete Mattress (6m x 3m each)	10	10	0	
					Grout bags	Unknown	Unknown	Unknown	
21	**PL6424**	Operating	Buried	Power Cable Douglas to Hamilton	Cable section	11,490m	10,961m	285m	Douglas Complex approach
					Concrete Mattress (6m x 3m each)	58	42	8	
					Cable section	As above	As above	244m	Hamilton Platform approach
					Concrete Mattress (6m x 3m each)	As above	As above	8	
22	**PL6423**	Operating	Buried	Power Cable Douglas to Hamilton North	Cable section	14,560m	14,238m	265m	Douglas Complex approach
					Concrete Mattress (6m x 3m each)	20	1	11	
					Cable section	As above	As above	57m	Hamilton North Platform approach
					Concrete Mattress (6m x 3m each)	As above	As above	8	
23	**PL6426**	Operating	Buried	Power Cable	Cable section	22,180m	22,039m	93m	Hamilton Platform approach
					Concrete Mattress	27	12	8	

				Hamilton to Lennox	(6m x 3m each)				
					Cable section	As above	As above	48m	Lennox Platform approach
					Concrete Mattress (6m x 3m each)	As above	As above	7	

2.3.5 Wells

The Liverpool Bay Asset has 42 platform wells spread over four (4) platforms; DW – 22 wells, LD – 13 wells, HH – 4 wells, and HN – 3 wells. Conwy wells (five) and Hamilton East will be the subject of separate Decommissioning Programmes.

Table 2-3, Table 2-4, Table 2-5 and Table 2-6 detail all operating and suspended platform wells. A number of the wells will be repurposed for the LBA carbon dioxide (CO_2) storage according to Transportation and Storage (T&S) project, as indicated in the tables.

Table 2-3: Wells – Douglas Wellhead (DW) Platform

Wells - DW Platform			
Well	**Designation**	**Status**	**Category of Well [1]**
110/13-D1	Oil Producer	Completed (Operating)	PL-3-3-3
110/13-D2	Oil Producer	Completed (Shut-in)	PL-3-3-3
110/13-D3	WAG Injector	Completed (Shut-in)	PL-3-3-3
110/13-D4	Water Injector	Completed (Operating)	PL-3-3-3
110/13-D5Z	Oil Producer	Completed (Operating)	PL-3-3-3
110/13-D6	Gas Injector	Completed (Operating)	PL-3-3-3
110/13-D7	Oil Producer	Completed (Shut-in)	PL-3-3-3
110/13-D8	Oil Producer	Completed (Shut-in)	PL-3-3-3
110/13-D9Y	Water Injector	Completed (Shut-in)	PL-3-3-3
110/13-D10	WAG Injector	Completed (Shut-in)	PL-3-3-3
110/13-D11Z	Oil Producer	Completed (Operating)	PL-3-3-3
110/13-D12	Producer	Completed (Operating)	PL-3-3-3
110/13-D13Z	Condensate Disposal	Completed (Shut-in)	PL-3-3-3
110/13-D14	Injector	Completed (Operating)	PL-3-3-3
110/13b-D15Z	Oil Producer	Completed (Shut-in)	PL-3-3-3
110/13b-D16Z	Oil Producer	Completed (Operating)	PL-3-3-3
110/13b-D17	Oil Producer	Completed (Operating)	PL-3-3-3
110/13b-D18	Oil Producer	Completed (Operating)	PL-3-3-3
110/13b-D19	Oil Producer	Completed (Operating)	PL-3-3-3
110/13b-D20Y	Oil Producer: a single well into Douglas West	Completed (Operating)	PL-3-3-3
110/13b-D21Z	Oil Producer	Completed (Shut-in)	PL-3-3-3
110/13b-D22	Oil Producer	Completed (Operating)	PL-3-3-3

Table 2-4: Wells – Hamilton (HH) Platform

Wells - HH Platform			
Well	**Designation**	**Status**	**Category of Well**
110/13-H1	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/13-H2	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/13-H3	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/13-H4	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
Hamilton MMV	N/A – Future Monitoring Well. Not yet drilled	N/A – Future Monitoring Well. Not yet drilled	N/A – Future Monitoring Well. Not yet drilled

Table 2-5: Hamilton North (HN) Platform

Wells - HN Platform			
Well	**Designation**	**Status**	**Category of Well**
110/13-N1	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/13-N2	Gas Producer	Completed (Operating)	PL-0-0-0 – Future Sentinel Well
110/13-N3	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
Hamilton North MMV	N/A – Future Monitoring Well. Not yet drilled	N/A – Future Monitoring Well. Not yet drilled	N/A – Future Monitoring Well. Not yet drilled

Table 2-6: Wells – Lennox Platform

Wells - LD Platform			
Well	**Designation**	**Status**	**Category of Well**
110/15-L1Z	Gas Producer	Completed (Operating)	PL-4-0-0 – Future Monitoring Well
110/15-L2	Gas Producer	Completed (Shut-in)	PL-4-3-3
110/15-L4	Gas Producer	Completed (Shut-in)	PL-0-0-0 – Future Sentinel Well
110/15-L5	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/15-L6Z	Gas Producer	Completed (Operating)	PL-4-3-3
110/15-L7Z	Gas Producer	Completed (Operating)	PL-4-3-3
110/15-L8Y	Gas Producer	Completed (Operating)	PL-4-3-3
110/15-L9	Gas Producer	Completed (Operating)	PL-4-3-3
110/15-L10X	Gas Producer	Completed (Operating)	PL-4-3-3
110/15-L11Z	Gas Producer	Completed (Operating)	PL-4-3-3
110/15a-L12Y	Gas Producer	Completed (Operating)	PL-4-3-3
110/15a-L13Z	Gas Producer	Completed (Operating)	PL-4-0-0 – Future CCS Injector Sidetrack
110/15a-L14Y	Gas Producer	Completed (Operating)	PL-4-3-3

(1) OEUK Well Decommissioning Guidelines, Issue 7, November 2022.

2.4 Drill Cuttings

The EBS reports fine sediments located in the proximity of platforms which could be associated with historical mostly dispersed drill cuttings. No piles have been found. The chemical analysis found no associated PAH suggesting the water based mud nature (RPS, 2022).

3.0 POLICY AND REGULATORY CONTEXT

The decommissioning of offshore oil and gas installations and pipelines on the United Kingdom Continental Shelf (UKCS) is controlled through the Petroleum Act 1998 (as amended). Decommissioning activities are also regulated under the Marine and Coastal Access Act 2009 and Marine (Scotland) Act 2010 ('the Marine Acts'). The OPRED Guidance Notes on the Decommissioning of Offshore Oil and Gas Installations and Pipelines (BEIS, 2018) set out a framework for the required environmental inputs and deliverables throughout the approval process; they also outline the requirements for undertaking a CA which should assess a project against five main criteria (environmental, safety, technical, societal and economic). Additional guidance on undertaking a CA was prepared in 2015 by Oil and Gas UK (OGUK, 2015a).

The UK's international obligations on decommissioning are primarily governed by the 1992 Convention for the Protection of the Marine Environment of the North East Atlantic (the Oslo Paris [OSPAR] Convention).

The responsibility for ensuring compliance with the Petroleum Act 1998 rests with Department for Energy Security and Net Zero (DESNZ) and is managed through its regulatory body the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED). OPRED is also the Competent Authority on decommissioning in the UK for OSPAR purposes and under the Marine Acts.

The Petroleum Act 1998 (as amended) governs the decommissioning of offshore oil and gas infrastructure on the UKCS. The Act requires the operator of an offshore installation or pipeline to submit a draft DP for statutory and public consultation, and to obtain approval of the DP from OPRED, before initiating decommissioning work. The DP must outline in detail the infrastructure to be decommissioned and the method by which the decommissioning will take place.

3.1 OSPAR Decision 98/3

As a Contracting Party of the OSPAR Convention, the UK is required to implement OSPAR Decision 98/3, which prohibits leaving offshore installations wholly or partly in place. The legal requirement for operators to comply with the OSPAR Convention is transposed through the Petroleum Act 1998 (as amended), which outline the expectations of the UK regulator in terms of complying with the relevant OSPAR decisions. OSPAR Decision 98/3 states that steel installations with a jacket weight less than 10,000 tonnes in air must be completely removed for re-use, recycling or final disposal on land.

3.2 Marine Planning Policy

The Marine Coastal Access Act 2009 introduced a number of measures to deliver the United Kingdom Government's vision of "clean, healthy, safe, productive and biologically diverse oceans and seas", including the introduction of eleven marine plan areas. North West Offshore Marine Plan and Welsh National Plan are applicable to the LBA Field. The objectives of the Marine Plan cover the following:

- Achieving a sustainable marine economy
    - Infrastructure is in place to support and promote safe, profitable and efficient marine businesses.
    - The marine environment and its resources are used to maximise sustainable activity, prosperity and opportunities for all, now and in the future.
    - Marine businesses are taking long-term strategic decisions and managing risks effectively. They are competitive and operating efficiently.
    - Marine businesses are acting in a way which respects environmental limits and is socially responsible. This is rewarded in the market place.
- Ensuring a strong, healthy and just society
    - People appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and can act responsibly.
    - The use of the marine environment is benefiting society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing.

- The coast, seas, oceans and their resources are safe to use.
- The marine environment plays an important role in mitigating climate change.
- There is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community.
- Use of the marine environment will recognise, and integrate with, defence priorities, including the strengthening of international peace and stability and the defence of the United Kingdom and its interests. Living within environmental limits
- Biodiversity is protected, conserved and, where appropriate, recovered, and loss has been halted.
- Healthy marine and coastal habitats occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems. Our oceans support viable populations of representative, rare, vulnerable, and valued species.

The LBA partial decommissioning project is in alignment with the objectives of the Marine Plan. Specific aspects of these objectives have been evaluated through impact categories selected for initial impact assessment including climate / air quality, use of resources, water quality, seabed conditions/onshore land, benthos, plankton, fish and shellfish, marine mammals, seabird, conservation sites, fisheries, other sea users, disposal facilities, communities, interested parties, cumulative impacts, in combination, transboundary issues and beneficial effects. Where necessary, additional consideration to the marine plan objectives and how their aims will be met has been included in the further assessment.

3.3 Environmental Management

Eni UK Ltd is committed to conducting its activities in a manner that protects people and the environment and in compliance with applicable regulatory requirements. Eni UK's Health, Safety and Environmental Policy shown in Figure 3-1, it is supported by Corporate Major Accident Prevention Policy (CMAPP) and Health, Safety and Environment Integrated Management System (HSE IMS). Eni's HSE IMS is certified to International Organization for Standardisation (ISO) 14001 Standard.

The safety and health of Eni's people, of the community and of its partners, and the protection of the environment are top priorities for Eni in all its activities.

Eni UK conducts its activities in accordance with all compliance obligations and with all other applicable HSE requirements and standards. Eni UK is committed to ensure the protection of the health and safety of workers and any members of the public involved in its operations and the safeguarding of the environment.

Eni UK is committed to eliminating hazards and reducing HSE risks in an integrated and systematic manner, in accordance with the principles of precaution, prevention, protection and continual improvement.

Eni UK maintains and implements its HSE Management System, assigning clear responsibilities to all levels of personnel in the company and ensuring that required competencies and resources are available.

In consultation with its workforce, Eni UK's top management performs an active role in setting direction and improvement objectives, fostering trust and promoting a positive HSE culture. Workers' representatives are elected to facilitate active participation of the entire workforce.

Eni UK adopts good practices in relation to HSE matters and supports active engagement with relevant industry associations, with the aim of developing and improving standards of HSE management and performance.

Eni UK considers the protection of health a fundamental requisite and promotes the psychological and physical well-being of its people.

Eni UK designs, develops, manages and decommissions its tangible assets ensuring the safeguarding of workforce health and safety, the minimisation of environmental impacts, the prevention of pollution and the optimisation of natural resources and energy use.

Eni UK selects and manages its contractors to ensure that they have the necessary capability and competence to meet its expectations in relation to HSE management.

Eni UK communicates to its stakeholders, in a transparent manner, the objectives and results that have been achieved in relation to HSE management and promotes long term cooperation, with the aim of achieving mutual sustainable development.

Eni UK is committed to progressively reducing carbon intensity through challenging operational energy efficiency targets, and to playing an active role in promoting the energy transition.

Luciano Vasques
Managing Director Eni UK

January 2023

eni uk

UK HSE IMS A1-SYS-01 rev.16

ECMS #427492 v.8

Figure 3-1: Eni HSE Policy

4.0 STAKEHOLDER CONSULTATION

The summary of the key stakeholder engagements is provided in the Table 4-1.

Table 4-1: Stakeholder Engagements

Who	Comment	Response
Informal Stakeholder Consultations		
Joint Nature Conservation Committee (JNCC)	• JNCC have been engaged to assess the impact of marine biodiversity and ornithology (eg. nesting birds, especially kittiwakes)	• Eni provided all the available information including methods of deterring birds from nesting on the platforms in the LBA field. There will be an ongoing engagement with JNCC to ensure minimal disturbance to any nesting birds offshore.
Health and Safety Executive (HSEx)	• Ongoing engagement with the HSEx to discuss safety case and CDM requirements throughout the decommissioning phases.	• HSEx have advised that the dismantling can be included in a phased safety case. Safety case strategy in planning. • HSEx have advised that CDM regs can be applied offshore, Eni are considering this.
Natural Resource Wales and Flintshire County Council Local Planning Authority (Onshore)	• NRW have been engaged to discuss the surrender of the Point of Ayr Environmental permit. • Onshore decommissioning and dismantling were also discussed in the Town and Country Planning Act (TCPA) application.	• NRW have confirmed onshore sampling will be required. • Permit surrender strategy in preparation. • TCPA application submitted, approval pending.

Who	Comment	Response
Shipping and Navigation Organisations	• Proposed Project overview including baseline shipping and navigational features and navigational risk assessment were presented • Consultees were asked if there were any other parties to be included in the engagement or information dissemination process • Port of Liverpool Authority requested the works to be broken down into phases to allow all the necessary permits to be obtained in a timely manner	• Royal Yachting Association confirmed being contend with the information presented • Stakeholders confirmed availability of their networks and willingness to disseminate the information as required • The Port of Liverpool Authority's request is in line with the Eni activity planning
Statutory Consultations		
National Federation of Fishermen's Organisations	•	•
Scottish Fishermen's Federation	•	•
Northern Ireland Fish Producers Organisation	•	•

Who	Comment	Response
Global Marine System's Limited	•	•
North Sea Transition Authority	•	•

Who	Comment	Response
Public	•	•

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5.0 DECOMMISSIONING ACTIVITIES

The platforms decks will be disconnected and completely removed in order to enable the installation of a new deck with CCS equipment for CO_2 injection downhole. The existing jacket will remain in place.

Figure 5-1 highlights the parts of the platforms that will be removed as part of the Partial Decommissioning (please note that Fig 5-1 is an example of Hamilton North Platform topsides removals schematics, other topsides removal schematics provided in the LBA Partial Decommissioning Programmes)

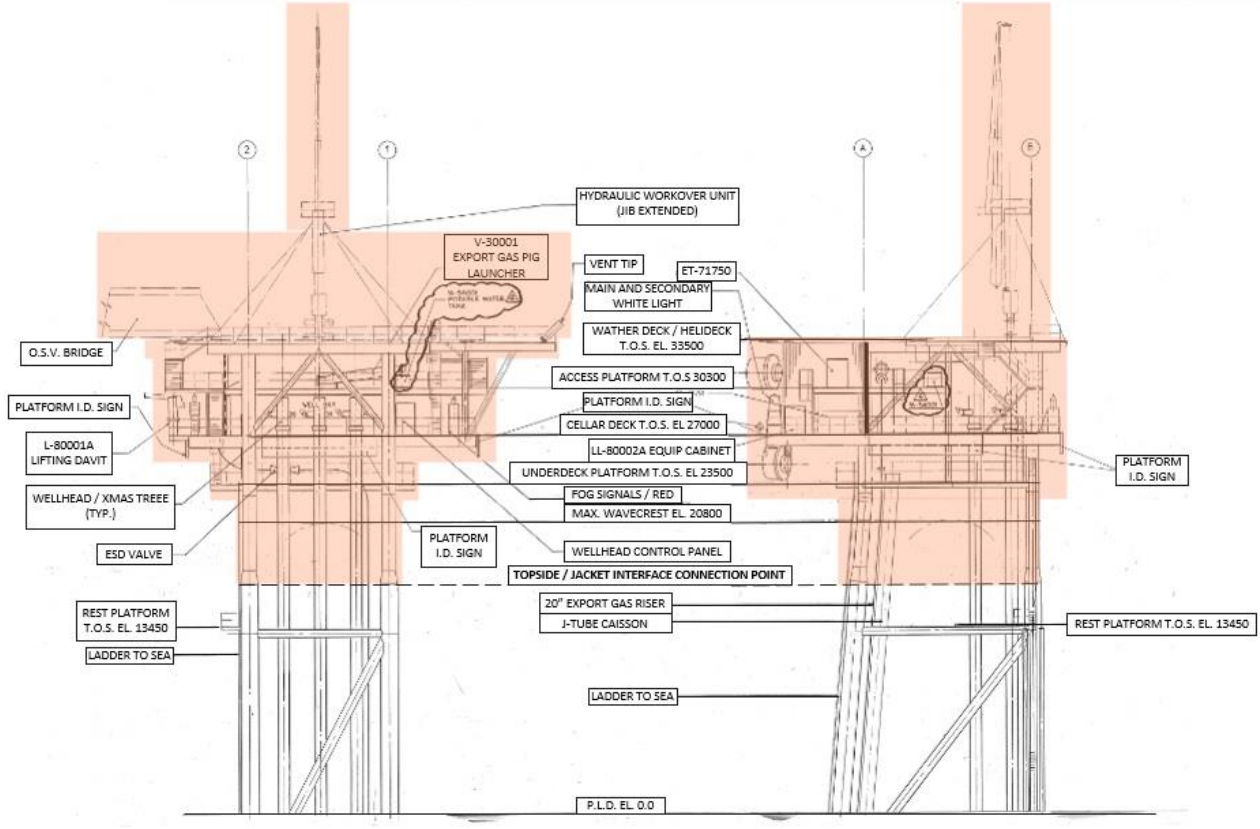

Figure 5-1: Platform – Deck Removal (*In **red** the parts subject to removal*)

The topsides will be disconnected from the jacket and removed according to the following sequence:

- Preparatory works at the platform
- Cutlines checking for platform's deck lifting and removal
- Preparatory work on wellhead and conductors
- Lifting pad eyes installation
- Heavy Lift Vessel (HLV) positioning and mooring
- Transportation and sea-fastening manual preparation
- Towing manual preparation
- Load-out / load-in Manual
- Disposal of Topside at a dedicated yard

5.1 Satellite Platforms HH, HN and LD – Removal Methods

HH, HN and LD Platforms will be subject to a customized disinvestment focused on the removal of existing platform's deck to allow the installation of a new deck with pre-installed CCS equipment and systems required to achieve initial (free flow) CO_2 injection. The removal methods are summarized in Table 5-1.

Table 5-1: Satellite Platforms HH, HN and LD – Removal Methods

Methods	Description
Single lift removal of Topsides by heavy lift vessel (HLV).	Removal of topsides as complete units and transportation to shore for re-use of selected equipment, recycling, break up, and/or disposal
Offshore removal 'piece small' for onshore reuse/disposal.	Removal of topsides by breaking up offshore and transporting to shore using work barge. Items will then be sorted for re-use, recycling or disposal
Proposed removal method and disposal route: Single lift removal of Topsides, by HLV.	The Topsides will be separated from the jacket structure by cutting below the main deck level. The complete unit will then be lifted and transported to the onshore disposal yard for re-use of selected equipment, recycling, break up and /or disposal. A final decision on the decommissioning method will be made following a commercial tendering process.

5.2 Subsea Pipelines and Stabilisation Materials – Removal Methods

Subsea Pipelines and stabilisation features present in the platforms' area (Section 2.3.4) will be subject to removal and transportation to shore for recycling and/or disposal.
Decommissioning of subsea pipelines, cables and stabilisation materials will be carried out in compliance with the relevant permitting requirements, including Marine License. The subsea pipelines, cables, umbilicals' and SSBVs' removal methods are summarized in Table 5-2 and disposal methods are in Table 5-2 (a).

Table 5-2: Subsea Pipelines and Umbilical – Decommissioning Methods

Pipelines and Umbilical Removal Methods			
Pipeline	**Condition of line**	**Whole or part of pipeline**	**Decommissioning options considered**
PL1030	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PL1032	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1033	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1034	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
Control Umbilical for PL1034 SSBV (Douglas), PLU6445	Buried	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4

PL1034 SSBV (Douglas)	Buried	It is intended that the SSBV exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
Control Umbilical for PL1034 SSBV (Lennox), PLU6435	Buried	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
PL1034 SSBV (Lennox)	Buried	It is intended that the SSBV exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
PL1035	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PL1035 SSBV (Lennox)	Buried	It is intended that the SSBV exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
Control Umbilical for PL1035 SSBV (Lennox), PLU6437	Buried	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
PL1036 Disused	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1036A	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PL1036A SSBV (Lennox)	Buried	It is intended that the SSBV exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
Control Umbilical from Lennox Platform to SUTU, PLU6438	Buried	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
Control Umbilical for PL1036A SSBV (Lennox), PLU6436	Buried	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	4
PL1037	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PL1038	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1039	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1040	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PL1041	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1042	Buried	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
PL1860	Buried	It is intended that the flexible line section exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Flexible Line cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

PLU1861	Buried	It is intended that the flexible line section exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Umbilical cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
Power Cable **Douglas to Hamilton, PL6424**	Buried	It is intended that the cables sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Cable cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6
Power Cable **Douglas to Hamilton North, PL6423**	Buried	It is intended that the cables sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Cable cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

Power Cable Hamilton to Lennox, PL6426	Buried	It is intended that the cables sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Cable cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	6

[1] The removals scope will include spools, cables and umbilicals sections from 0.6m BD up to the interface with the platform (e.g. riser bottom flange or j-tube bellmouth), in accordance with BEIS Guidance Notes "Decommissioning of Offshore Oil and Gas Installations and Pipeline".

*Key to Options:

1) Remove – reverse reeling

2) Remove – reverse S lay

3) Trench and bury

4) Remedial removal

5) Remedial trenching

6) Partial removal

Pipelines and Stabilisation Features Removal Methods and Disposal Routes			
Pipelines and stabilization features	**Number**	**Option**	**Disposal Route (if applicable)**
Cables	3	It is intended that the cables sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Cable cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be	Transportation to shore for recycling and / or disposal

		examined through a comparative assessment process.	
Concrete Mats	264	Full recovery. It is intended that the mattresses will be recovered to shore, however in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	Transportation to shore for recycling and / or disposal
Control Umbilicals	6	It is intended that the control umbilicals sections exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	Transportation to shore for recycling and / or disposal
Flexible Line	1	It is intended that the flexible line section exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Flexible Line cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	Transportation to shore for recycling and / or disposal
Spools / Section of pipelines	13	It is intended that the spools exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). Pipelines cut ends will be lowered in the seabed by means of a jet trencher machine to guarantee a full stabilization. However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	Transportation to shore for recycling and / or disposal

SSBV	4	It is intended that the SSBV exposed on the seabed will be removed and recovered to shore, from 0.6m BD up to interface with platform (**Note 1**). However, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment process.	Transportation to shore for recycling and / or disposal

Table 5-2 (a) Pipeline and Stabilisation Features Disposal Methods

Notes on

[1] The removals scope will include spools, cables and umbilicals sections from 0.6m BD up to the interface with the platform (e.g. riser bottom flange or j-tube bellmouth), in accordance with BEIS Guidance Notes "Decommissioning of Offshore Oil and Gas Installations and Pipeline".

[2] Pipeline sections to be removed under this DP are as detailed in table 2-2, removal of the remainder of the pipeline not removed during phase 1 will be subject to a full CA and covered under the LBA Pipelines DP

5.3 Wells – P&A

The well plug abandonment methods are provided in Table 5-3.

Table 5-3: Well Plug and Abandonment Method

Well Plug and Abandonment Method
The wells (listed in Section 2.3.5) will be plugged and abandoned in compliance with the requirements of the Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996 (DCR) and abandoned in accordance with the latest version of the OEUK Well Decommissioning Guidelines (Issue 7, November 2022). Well abandonment will be undertaken in accordance with approved well designs, applicable legislation, Permits, Licences, Consents, Notifications and Approvals will be applied for commensurate with the work, and any associated conditions will be complied with and verified.

5.4 Drill Cuttings Decommissioning Options

It is believed that the relatively high tidal and wave generated currents in the area, together with the shallowness of the predicted cuttings deposition have caused the cuttings to dissipate in the period since the wells were drilled. The hydrographic regime in the East Irish Sea is such that cuttings are typically redistributed by natural physical processes.

5.5 Waste Management

The Project waste hierarchy aligns with the principles of the European Union (EU) Waste Framework Directive (Directive 2008/98/EC) (Figure 5-2). Contractor and onshore site selection process will be implemented to ensure compliance with waste hierarchy and all applicable waste regulations and Duty of Care.
Waste duty of care code of practice, issued under section 34 of the Environmental Protection Act 1990, which provides practical guidance on how to meet waste duty of care requirements in England and Wales will be followed up (DEFRA & EA, 2018).

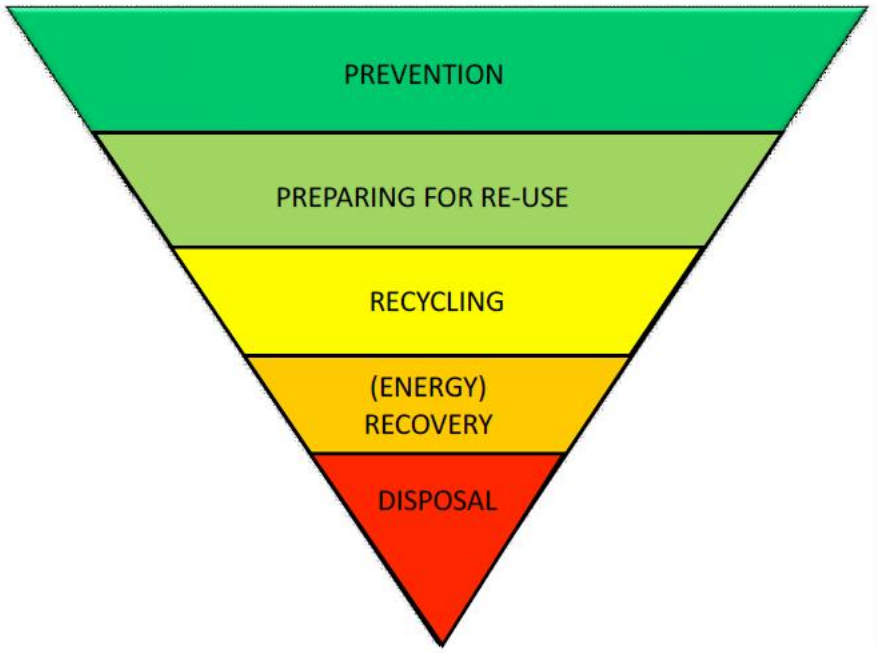

Figure 5-2: Waste Hierarchy (EU Waste Framework Directive)

Recyclable metals, predominantly steel and iron, are estimated to account for the greatest proportion of the materials inventory. Topsides and jackets structures will be transported to an onshore decommissioning facility for segregation, re-use and recycling. Contractor and site selection process is in early stages and thus the potential trans-frontier shipment of waste cannot be dismissed for certainty.

All other wastes generated offshore during decommissioning will be segregated and recorded by type, before being transported to onshore waste facilities through licensed waste contractors. Tables 5-3 to 5-11 summarise current estimated breakdown of materials to be removed.

TOPSIDES TOTAL		
W. CODE	**SUMMARY**	**Weight (Te)**
	17 04 METALS (including their alloys)	**464.65**
17 04 05	IRON AND STEEL	387.40
17 04 07	MIXED METALS	56.86
17 04 11	COPPER/STEEL	20.40
	17 02 WOOD, GLASS, PLASTIC	**0.29**
17 02 03	PLASTIC	0.29
	17 06 INSULATION MATERIALS	**4.04**
17 06 04	INSULATION MATERIALS	4.04
	16 02 WEEE TOTAL	**10.15**
16 02 16	METAL / PLASTIC	10.15
	OTHER	**23.20**
08 01 11	REMOVAL OF PAINT AND VARNISH	6.10
11 05 01	GALVANIZED STEEL	12.91
16 06 01	LEAD BATTERY	4.20
GRAND TOTAL (NO CONTINGENCY)		**502.33**
GRAND TOTAL (+ 5% CONTINGENCY)		**527.45**
GRAND TOTAL (-10% ACCURACY)		**474.71**
GRAND TOTAL (+10% ACCURACY)		**580.20**

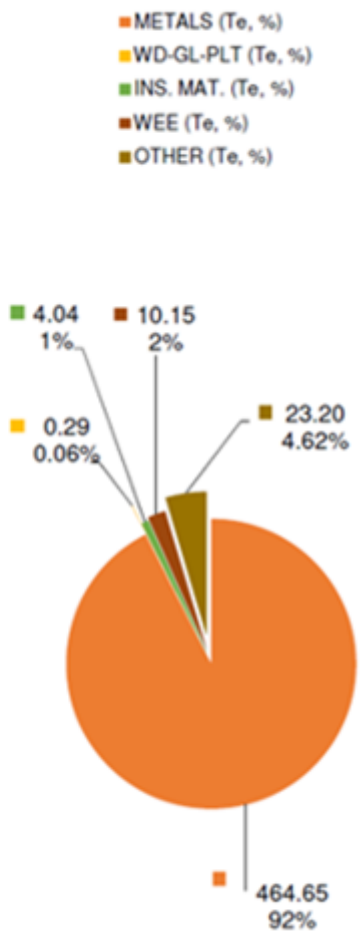

Table 5-3 Hamilton HH Platform – Overall Materials Summary

Description	Dry Weight (Te) No Contingency	Dry Weight (Te) 5% Contingency	Dry Weight (Te) - 10% Accuracy	Dry Weight (Te) + 10% Accuracy
EQUIPMENT	11.5	12	10.9	13.3
PIPING	79.7	83.7	75.4	92.1
INSTRUMENT	42.3	44.4	40	48.9
ELECTRICAL	45.6	47.9	43.1	52.7
STRUCTURAL	283.6	297.7	268	327.5
TELECOM	2.6	2.8	2.5	3
HVAC	9.3	9.8	8.8	10.8
ARCHITECTURAL	21.9	22.9	20.7	25.2
HSE	5.8	6.1	5.5	6.7
GRAND TOTAL	**502.33**	**527.45**	**474.71**	**580.20**

Table 5.4 Hamilton HH Platform – Topside Inventory

TOPSIDES TOTAL		
W. CODE	SUMMARY	Weight (Te)
	17 04 METALS (including their alloys)	460.53
17 04 05	IRON AND STEEL	387.67
17 04 07	MIXED METALS	53.72
17 04 11	COPPER/STEEL	19.14
	17 02 WOOD, GLASS, PLASTIC	0.20
17 02 03	PLASTIC	0.20
	17 06 INSULATION MATERIALS	3.44
17 06 04	INSULATION MATERIALS	3.44
	16 02 WEEE TOTAL	10.27
16 02 13	METAL / PLASTIC	3.40
16 02 16	METAL / PLASTIC	6.87
	OTHER	22.96
08 01 11	PAINT AND VARNISH	6.06
11 05 01	GALVANIZED STEEL	12.70
16 06 01	LEAD BATTERY	4.20
GRAND TOTAL (NO CONTINGENCY)		497.41
GRAND TOTAL (+ 5% CONTINGENCY)		522.28
GRAND TOTAL (-10% ACCURACY)		470.05
GRAND TOTAL (+10% ACCURACY)		574.51

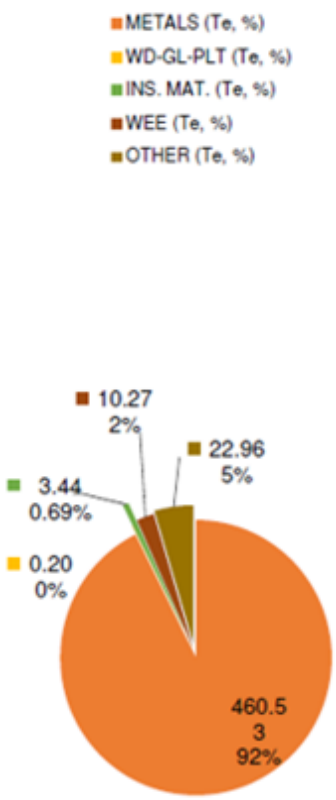

Table 5.5 Hamilton North HN Platform - Overall Materials Summary

Description	Dry Weight (Te) No Contingency	Dry Weight (Te) 5% Contingency	Dry Weight (Te) - 10% Accuracy	Dry Weight (Te) + 10% Accuracy
EQUIPMENT	10.1	11	9.6	11.7
PIPING	73	76.6	69	84.3
INSTRUMENT	49	51.4	46.3	56.6
ELECTRICAL	38.6	40.5	36.5	44.6
STRUCTURAL	287.3	301.7	271.5	331.8
TELECOM	2.7	2.9	2.6	3
HVAC	9.3	9.8	8.8	10.8
ARCHITECTURAL	21.7	22.7	20.5	25
HSE	5.7	6	5.4	6.6
GRAND TOTAL	**497.41**	**522.28**	**470.05**	**574.51**

Table 5.6 Hamilton North HN Platform – Topside Inventory

TOPSIDES TOTAL		
W. CODE	SUMMARY	Weight (Te)
	17 04 METALS (including their alloys)	1,101.07
17 04 05	IRON AND STEEL	864.80
17 04 07	MIXED METALS	200.43
17 04 11	COPPER/STEEL/ PVC	35.84
	17 02 WOOD, GLASS, PLASTIC	6.15
17 02 03	PLASTIC	6.15
	17 06 INSULATION MATERIALS	4.65
17 06 04	INSULATION MATERIALS	4.65
	16 02 WEEE TOTAL	35.70
16 02 13	GRP / BRASS	0.05
16 02 16	METAL / PLASTIC	35.65
	OTHER	47.34
08 01 11	PAINT AND VARNISH	12.01
11 05 01	GALVANIZED STEEL	28.03
16 06 01	LEAD BATTERY	7.30
GRAND TOTAL (NO CONTINGENCY)		1,194.91
GRAND TOTAL (+ 5% CONTINGENCY)		1,254.66
GRAND TOTAL (-10% ACCURACY)		1,129.19
GRAND TOTAL (+10% ACCURACY)		1,380.12

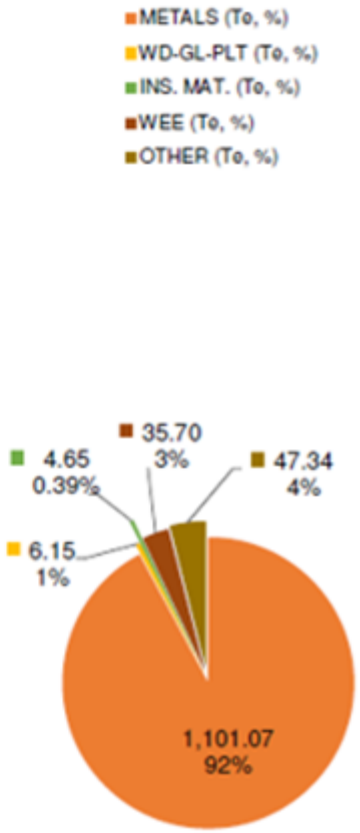

Table 5.7 Lennox LD Platform - Overall Materials Summary

Description	Dry Weight (Te) No Contingency	Dry Weight (Te) 5% Contingency	Dry Weight (Te) - 10% Accuracy	Dry Weight (Te) + 10% Accuracy
EQUIPMENT	113.9	120	107.7	131.6
PIPING	259.2	272.1	244.9	299.4
INSTRUMENT	112.8	118.4	106.6	130.3
ELECTRICAL	81.3	85.4	76.8	93.9
STRUCTURAL	584	613.2	551.9	674.6
TELECOM	2.8	2.9	2.6	3
HVAC	8.9	9.4	8.4	10.3
ARCHITECTURAL	19.4	20.3	18.3	22.4
HSE	12.6	13.2	11.9	14.6
GRAND TOTAL	**1,194.91**	**1,254.66**	**1,129.19**	**1,380.12**

Table 5.8 Lennox LD Platform - Topside Inventory

PIPELINES INSTALLATIONS AND STABILISATION FEATURES TOTAL		
W. CODE	SUMMARY	Weight (Te)
	17 04 METALS (Including their alloys)	1,745.99
17 04 01	NON-FERROUS METAL	7.43
17 04 05	IRON AND STEEL	1,595.56
17 04 11	COPPER / STEEL / PVC	143.00
	17 02 WOOD, GLASS, PLASTIC	244.20
17 02 03	PLASTIC	244.20
	17 01 CONCRETE, BRICKS, TILES AND CERAMICS	1,471.59
17 06 04	CONCRETE	1,471.59
	17 03 01 BITUMIOUS, COAL TAR AND TARRED PRODUCTS	47.55
17 03 01	BITUMINOUS MIXTURES CONTAINING COAL TAR	47.55
GRAND TOTAL (NO CONTINGENCY)		3,509
GRAND TOTAL (+ 5% CONTINGENCY)		3,685
GRAND TOTAL (-10% ACCURACY)		3,316
GRAND TOTAL (+10% ACCURACY)		4,053

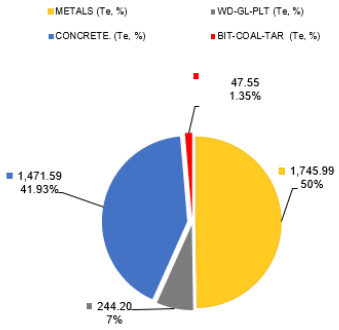

Table 5.9 Pipelines and Stabilisation Features - Overall Materials Summary

Description	Dry Weight (Te) No Contingency	Dry Weight (Te) 5% Contingency	Dry Weight (Te) - 10% Accuracy	Dry Weight (Te) + 10% Accuracy
PIPELINES	2,580.7	2,709.7	2,438.8	2,980.7
MATTRESSES	928.3	974.7	877.2	1,072.2
GRAND TOTAL	**3,509**	**3,684**	**3,316**	**4,053**

Table 5-10 Pipelines and Stabilisation Features – Inventory

Inventory Disposition			
	Total Inventory Tonnage	**Planned tonnage to shore**	**Planned left in situ**
Topsides	2,193 tons	2,193 tons	0 tons
Pipelines	3,509 tons	3,509 tons	0 tons

Table 5-11 Inventory Disposition

5.6 Waste Inventory Estimates

A comprehensive Waste Management Plan will be developed for all waste disposal activities by the project prior to the commencement of those activities. In addition, a detailed audit programme will be developed to ensure that all waste disposal routes and facilities are fully audited to ensure regulatory compliance prior to commencement of activities.

It is anticipated that equipment contaminated with naturally occurring radioactive material (NORM) scale or sludge will be encountered during the project. Eni will ensure appropriate Radioactive Substance Regulation (RSR) permit are in place and conditions that dictate the management and control of radioactive waste are met, including the requirement to minimise radioactive waste volumes, for monitoring and measurement regimes, and to meet storage conditions and duration.

The primary route for disposal of flushed fluids from subsea pipelines preparation and cleaning activities is also injection into Douglas Wellhead (DW) wells. However, in cases where injection downhole is deemed not feasible or unsafe, disposal fluids will be directed to the OSB for settling before being discharged overboard in compliance with the required regulatory permits and consents. O

Disposal options for other wastes are shown in Table 5-12.

Table 5-12: Topsides Preparation and Cleaning

Waste Type	Composition of waste	Disposal Route
On-board Hydrocarbons and liquids arising from flushing during Making Safe	Process fuels, Diesel, lubricants	Where possible, on-board HCs will be re-injected into the reservoir at Douglas Wellhead (DW). Should this approach be unsuccessful or if a suitable well is unavailable, flushed fluids containing HCs will disposed into a dedicated offshore tanker, subject to appropriate consents.
Hydraulic Fluid	Liquids drained from skids and equipment.	Hydraulic fluids will be drained into suitable containers and transported onshore for re-use/disposal
NORM	Potentially contained within liquids, scales, residues, and internal contamination to process pipework presence to be identified on breaking of containment	If the presence of NORM is identified, where possible it will be injected into the reservoir via a donor well. Where this approach is not available (bulk NORM solids) it will be transported onshore and disposed of in accordance with the regulations.
Asbestos and Ceramic Fibre	Compressed asbestos fibre (CAF) gaskets, panelling, as defined in asset asbestos register and asbestos surveys.	The presence of quantities of asbestos is anticipated in the topsides process systems, in form of CAF gaskets, and within panels of topsides accommodation. Asbestos-containing materials will be transported onshore and disposed of via an appropriately licenced waste management contractor.

Waste Type	Composition of waste	Disposal Route
Other Hazardous Materials	Liquids, sludges, cleaning chemicals	Where possible, cleaning chemicals will be injected into the reservoir via a donor well together with remaining hydrocarbon inventory and flushing fluids. Should this approach be unsuccessful or if a suitable donor well is unavailable, they will be returned to shore for appropriate disposal. If any hydrogen sulphide (H_2S) is found the primary disposal route will be into a donor well.

Upon verification that systems have been adequately cleaned in compliance with the cleanliness targets according to the project's Cleaning Strategy (2023), the topside and pipelines systems will be positively isolated and made ready for disconnection and removal.

6.0 ENVIRONMENTAL BASELINE

This section provides an overview of the key environmental features in the vicinity of the LBA that may be affected by the proposed decommissioning works. The information has been used to assess the level of impact that the activities will potentially have on the environment.

6.1 Environmental Survey

A subtidal benthic survey was carried in October 2022 by RPS Energy LTD (note: RPS commissioned Ocean Ecology Limited (OEL) for this scope) on behalf of ENI UK LTD to support the EA for the partial decommissioning of the ENI UK Liverpool Bay oil and gas offshore infrastructure, and the full decommissioning of the OSB see Figure 6-1 and 6-2). All survey operations were conducted onboard OEL's survey vessel, the *Argyll Explorer.*

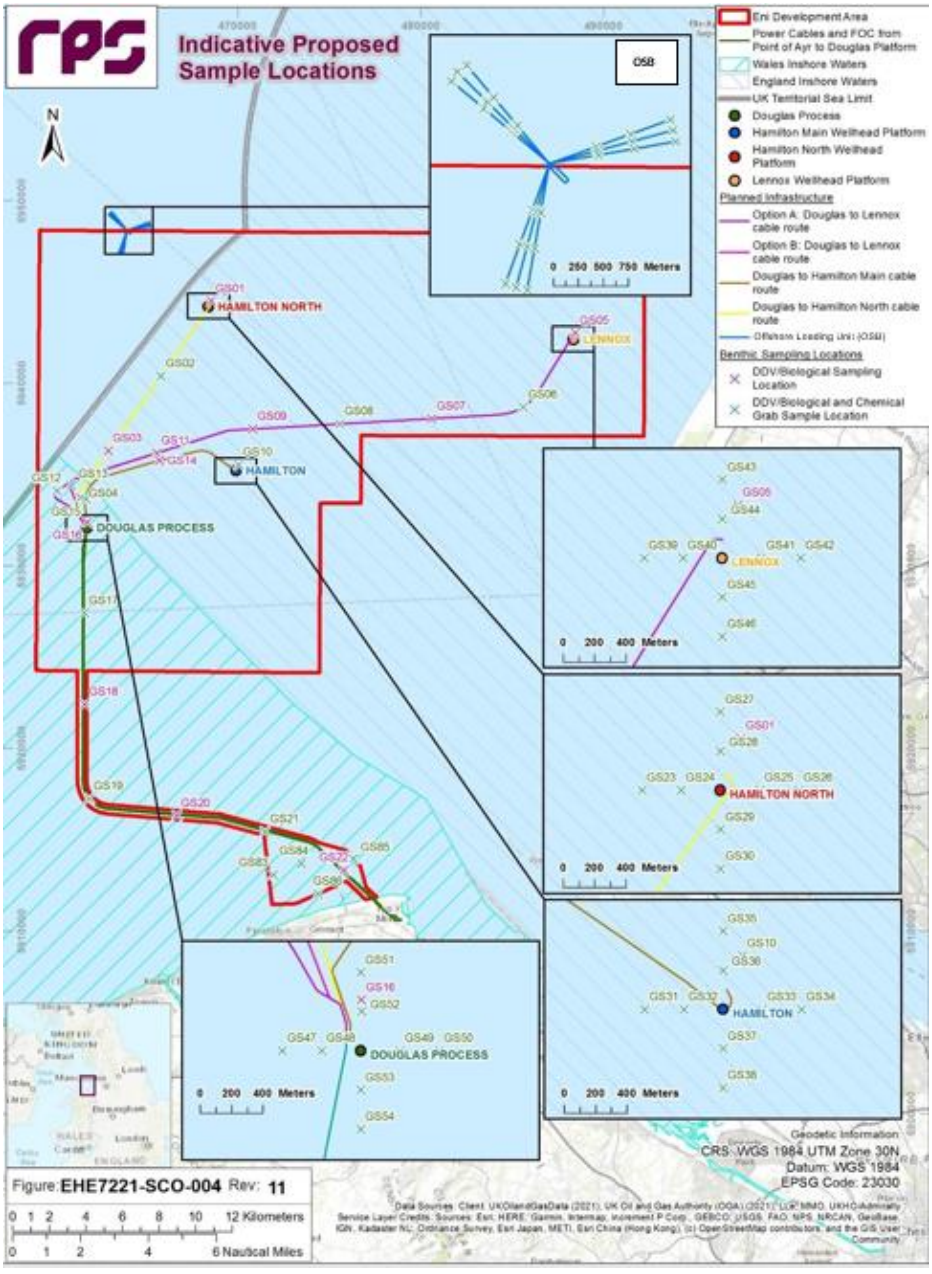

Figure 6-1 Environmental Baseline Survey (EBS) Sampling Locations 2022 (RPS, 2022)

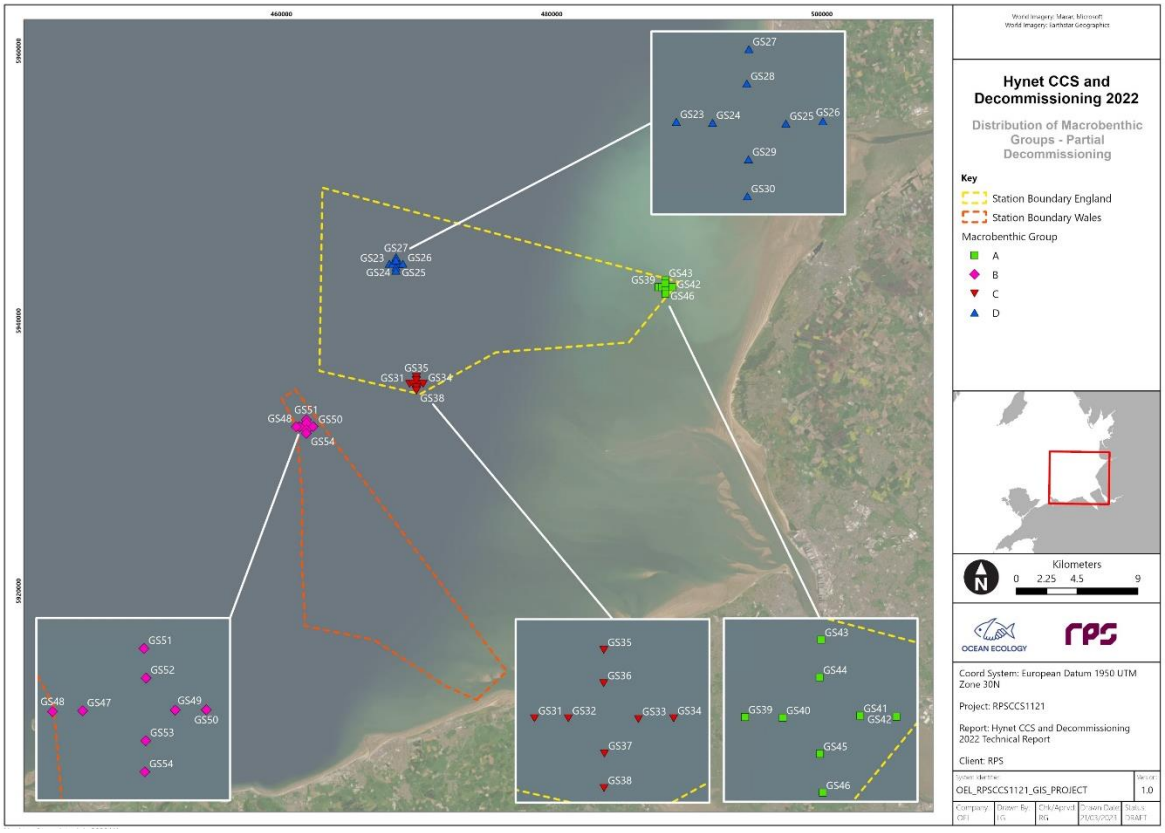

Figure 6-2 Environmental Baseline Survey (EBS) Sampling Locations 2022 (RPS, 2022)

The survey involved the collection of seabed imagery and sediment samples using a drop-down camera (DDC) system. Following an onboard review of the DDC footage, if an Annex I habitat was confirmed at a location, sampling was to be limited to DDC only rather than a combination of benthic grab sampling and DDC. Following this pre-screening at each sampling station, grab sampling for macrobenthic, particle size distribution (PSD) and sediment chemical analysis were conducted. A total of 85 stations were targeted during the survey, 32 of which were specifically targeted to support the partial decommissioning as shown in Table 6-1.

Table 6-1: Sampling Strategy

Site	DDC Stations	Macrobenthic/PSD	Chemical
Proposed Development	26	24	14
Partial decommissioning of Eni UK Liverpool Bay	32	32	32
OSB full decommissioning	27	21	21
Total	**85**	**77**	**67**

6.2 Marine Protected Areas

The European Community (EC) Directive 92/43/EEC as amended by 97/62/EC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive), and the EC Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive), are the main instruments of the EU for safeguarding biodiversity (Johnston *et al*., 2002).

The Habitats Directive includes a requirement to establish a European network of important high quality conservation sites that will make a significant contribution to conserving the habitat and species identified in Annexes I and II of the Directive. Habitat types and species listed in Annexes I and II are those considered to

be in most need of conservation at a European level (Johnston *et al*., 2002). The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended), the Conservation of Offshore Marine Habitats and Species Regulations 2017 and the Conservation of Habitats and Species Regulations 2017 implement the EC Habitats Directive in UK Law. The Conservation of Offshore Marine Habitats and Species Regulations 2017 include provisions for the designation and protection of areas that host important habitats and species in the offshore marine area (i.e., SACs, SPAs). These regulations apply to waters wholly or partly on the UKCS and outside UK territorial waters.

6.2.1 Annex I Habitats, Special Areas of Conservation (SAC), SPA and SCIs

JNCC has been commissioned by the UK government to identify areas and species that may qualify as possible offshore SACs, SCIs, SPAs and Ramsar sites under the EU Habitats and Birds Directives respectively. In Liverpool Bay a total of 14 coastal SPAs have been designated and one marine SPA, Liverpool Bay SPA. The total area of the Liverpool Bay SPA is approximately 252,773 ha. During 2017, proposed boundary changes to the existing Liverpool Bay SPA were approved. The additional areas in this Liverpool Bay SPA extension encompass 82,481 ha, an increase of 48.4% from the previous SPA, with the new area now including the Douglas complex and both Hamilton and Lennox NUIs.

The Liverpool Bay site qualifies as an SPA for the following reasons:

- Site regularly supports more than 1% of the Great Britain (GB) populations of one species listed in Annex 1 of the EC Birds Directive.
- Site regularly supports more than 1% of the bio-geographical population of one regularly occurring migratory species not listed in Annex 1 of the EC Birds Directive.
- Site regularly supports more than 20,000 waterfowl during the non-breeding season.

The conservation sites within 40km of the LBA Field are described in Table 6-2

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Table 6-2: Conservation Areas

Site Name	Distance and Direction	Qualifying Features and Site Description
Fylde MCZ	3 km north (N) from Lennox platform	Designated in 2013 in order to maintain the broad scale habitat "sub-tidal sand" and the habitat of conservation importance "sub-tidal sands and gravels" which are found in the area, the Flyde MCZ lies approximately 3.6 km from the Flyde coast, off the Ribble Estuary and covers an area of 260 km^2. Chosen for the extensive areas of subtidal sediment habitats and plant and animal communities present. The sediment habitats are known to support rich bivalve mollusc populations. The site includes important nursery and spawning grounds for several commercially important fish species including sole (*Solea solea*), plaice (*Pleuronectes platessa*) and whiting (*Merlangius merlangus*). Fylde overlaps the Liverpool Bay Special Protection Area, which was designated to protect birds such as the red-throated diver and common scoter. The alliance will not only protect the birds, but the MCZ designation will protect their food source as well. The seabed of Flyde MCZ supports a diversity of marine life including bivalves, sandeels flatfish, rays gurnard and crustaceans. The zone protects habitats of subtidal sands and gravels. **Qualifying features:** Subtidal sand, subtidal mud. The subtidal sands and mud are highly productive and are known to support rich bivalve mollusc populations. The site supports an abundance of animals such as crabs, starfish, shrimp-like crustaceans, and bivalve shellfish, including the commonly found small nut-shell (*Nucula nitidosa*), a razor shell (*Pharus legumen*) and the white furrow shell (*Abra alba*). Flatfish, including sole (*S. solea)* and plaice ((*P. platessa)*, in addition to whiting (*M. merlangus*) are also supported by the habitat within the site. The diversity of these waters not only attracts other species to feed, but also recreational activities such as diving and sailing which are popular here.
Liverpool Bay SPA	Hamilton East subsea facility and Lennox Platform lie within SPA. ~ 15 m to Douglas complex ~ 440 m from Hamilton platform;	SPA was classified by the UK Government to meet obligations set out in the Birds Directive (2009/147/EC) and is protected by the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended). Site area - 2,528 km^2. Water depth within the site ranges from mean low water to about 66 m water depth. The boundary of Liverpool Bay SPA extends beyond 12 nautical miles and therefore lies partly in Welsh and English territorial waters and partly in offshore waters. Natura 2000 site. **Annex I species** - Common tern (*Sterna hirundo*), little tern (*S. albifrons*), red-throated diver (*Gavia stellata*), little gull (*Hydrocoloeus minutus*). **Regularly occurring migratory species** - Common scoter (*Melanitta nigra*). **Waterbird assemblage** including all species above as well as Red-breasted Merganser (*Mergus serrator*) and Great Cormorant (*Phalacrocorax carbo*) which are present in numbers exceeding 1% of GB total.

Site Name	Distance and Direction	Qualifying Features and Site Description
	~ 2 km from Hamilton North platform.	**Qualifying features:** The site comprises of a large marine area and sea inlets. In the non-breeding season, the area regularly supports over 55,000 waterfowl including red-throated loon (*Gavia stellate)* and common scoter (*M. nigra)* as well as an internationally important assemblage of waterfowl. Additionally, the boundary of the existing marine SPA has been extended to provide protection for little gull (*H. minutus)* and extend further inshore to offer protection to foraging common tern (*S. hirundo)* and little tern (*S. albifrons)*. The site contains a wide range of mobile sediments. Sand is the most common substrate, with a concentrated area of gravelly sand located off the Mersey Estuary. It protects the largest aggregation of common scoters, the largest marine aggregation of little gull, and the third largest aggregation of red-throated diver in the UK. It also supports foraging areas for nearly 7% of the GB population of little terns, and nearly 2% of the GB population common terns.
Ribble Estuary MCZ	15 km northeast (NE) from Lennox platform	**Qualifying features**: Smelt (*O. eperlanu*s) are known to congregate in large shoals in lower estuaries and migrate into freshwater where they spawn in spring. The site provides critical habitat required for smelt to complete its lifecycle, including for feeding and post-larval development. For this MCZ site, Natural England is currently in the process of developing a Conservation Advice package.
Wyre-Lune MCZ	34 km NE from Lennox platform	**Qualifying features:** Smelt (*O. eperlanus)* are known to congregate in large shoals in lower estuaries and migrate into freshwater where they spawn in spring. The Wyre and Lune estuary provides critical habitat required to complete smelt lifecycles, including for feeding and post-larval development. For this MCZ site, Natural England is currently in the process of developing a Conservation Advice package.
West of Walney MCZ	30 km N from Douglas FSU (OSB)	Located 8 km offshore from Walney Island, Cumbria, with an area of 388 $km^{2,}$ this MCZ covers two different habitat types: mud to the north and sand to the south. The zone protects subtidal mud habitats in deep water, sea pens and burrowing megafauna. **Qualifying features:** Subtidal sand, subtidal mud, sea-pen and burrowing megafauna communities. Mud and sand are both brilliant habitats for wildlife and full of life. The seabed habitat within site is predominantly subtidal mud and is considered part of an area known as the eastern Irish Sea mud belt. Sea-pen and burrowing megafauna communities' (which is considered Threatened and or Declining habitat in the north east Atlantic, and specifically in the Irish Sea, by the OSPAR commission) makes up a component part of the subtidal mud habitat occurring within the site's boundary. This habitat is characterised by the presence of sea-pens (feather-like soft corals) and burrowing animals such as mud shrimp and the Norway lobster *(Nephrops norvegicus),* which is a commercially important species.

Site Name	Distance and Direction	Qualifying Features and Site Description
Ribble and Alt Estuaries SPA	7 km southeast (SE) from Lennox platform	**Birds Directive (2009/147/EC). Natura 2000 site** **Annex I species** - Common Tern (*S. hirundo*), bar-tailed godwit (*L. lapponica*), golden plover (*Pluvialis apricaria*), whooper swan (*Cygnus cygnus*), Bewick's swan (*Cygnus columbianus bewickii*). **Regularly occuring migratory species** - Redshank (*Tringa totanus*), black tailed godwit (*L. limosa islandica*), dunlin (*Calidris alpina alpina*), grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), oystercatcher (*Haematopus ostralegus*), pintail (*Anas acuta*), shelduck (*Tadorna tadorna*), lesser black-backed gull (*Larus fuscus*), pink-footed goose (*Anser brachyrhynchus*), *teal (Anas crecca*). **Waterbird assemblage** including all species above as well as ringed plover (*Charadrius hiaticula*), ruff (*Calidris pugnax*), sanderling (*Calidris alba*), wigeon (*Mareca penelope*). **Seabird assemblage** (breeding).
Mersey Narrows and North Wirral Foreshore SPA	23 km SE from Lennox platform	**Birds Directive (2009/147/EC). Natura 2000 site** **Annex I species** - Common tern (*S. hirundo*), bar-tailed godwit (*L. lapponica*). **Regularly occurring migratory species** - Knot (*C. canutus*). **Waterbird assemblage** including all species above as well aslLittle gull (*H. minutus*). **Qualifying features:** Migratory redshank (*T. totanus*) and turnstone (*Arenaria interpres*), over winter, and internationally important waterbird assemblage. The site comprises intertidal habitats at Egremont foreshore, man-made lagoons at Seaforth Nature Reserve, and the extensive intertidal flats at North Wirral Foreshore. Egremont is most important as a feeding habitat for waders at low tide whilst Seaforth is primarily a high-tide roost site, as well as a nesting site for terns. North Wirral Foreshore supports large numbers of feeding waders at low tide and also includes important high-tide roost sites.
Anglesey Terns/ Morwenoliaid Ynys Mdn SPA	36 km southwest (SW) from Douglas complex	**Birds Directive (2009/147/EC)** **Annex II species** - Red-breasted Mergan (*Mergus serrator*), oystercatcher (*H. ostralegus*), curlew (*Numenius arquata),* redshank (*T. totanus).* **Regularly occurring migratory species** - Great crester grebe (*Podiceps cristatus).* **Qualifying features**: Common tern (*S. hirundo*), Arctic tern (*S. paradisea*), roseate tern (*S. dougalli*), and sandwich tern (*S. sandvicensis*) in the breeding season. The site protects the breeding tern colonies at Ynys Feurig, Cemlyn Bay and the Skerries, and includes the marine area used by the foraging terns during the breeding season.

Site Name	Distance and Direction	Qualifying Features and Site Description
Traeth Lafan/Lavan Sands, Conway Bay SPA	40 km SW from Douglas complex	**Birds Directive (2009/147/EC)** **Annex I species** - Roseate tern (*S. dougallii),* common tern (*S. hirundo),* Arctic tern (*S. paradisaea),* sandwich tern (*S. sandvicencis).* **Qualifying features**: Migratory oystercatcher (*H. ostralegus*) over winter. Lavan Sands is a large intertidal area of sand- and mud-flats. The area has a range of exposures and a diversity of conditions, enhanced by freshwater streams that flow across the flats. The site is of importance for wintering waterbirds, especially oystercatcher. In conditions of severe winter weather, Traeth Lafan acts as a refuge area for oystercatchers displaced from the nearby Dee Estuary.
Y Fenai a Bae Conwy / Menai Strait and Conwy Bay SPA	23 km SW from Douglas complex	**Habitats Directive (92/43/EEC)** Primary reason for selection **Annex I habitats** -Sandbanks which are slightly covered by sea water all the time, mudflats and sandflats not covered by seawater at low tide, reefs. **Qualifying features** **Annex I habitats** - Large shallow inlets and bays, Submerged or partially submerged sea caves.
The Dee Estuary SPA	24 km SE from Douglas complex	**Birds Directive (2009/147/EC). Natura 2000 site** **Annex I species -** Common Tern (*S. hirundo*), little tern (*S. albifrons*), sandwich tern (*S. sandvicensis*), bar-tailed godwit (*L. lapponica*). **Regularly occuring migratory species -** Redshank (*T. totanus*), black tailed godwit (*L. islandica*), curlew (*N. arquata*), dunlin (*Calidris alpina*), grey plover (*P. squatarola*), knot (*C. canutus islandica*), oystercatcher (*H. ostralegus*), pintail (*A. acuta*), shelduck (*T. tadorna*), teal (*A. crecca*). **Waterbird assemblage** including all species above as well as great crested grebe (*P. cristatus*), great cormorant (*P. carbo*), wigeon (*A. penelope*), lapwing (*Vanellus vanellus*) and sanderling (*C. alba*). **Qualifying features:** Common tern (*S. hirundo*) and little tern (*S. albifrons*) during the breeding season; sandwich tern (*S. sandvicensis*) on passage; bar-tailed godwit (*L. lapponica*) over winter; migratory redshank (*T. tetanus*) (on passage), black-tailed godwit (*L. limosa islandica*), curlew (*N. arquata*), dunlin (*C. alpina alpine*), grey plover (*P. squatarola*), knot (*C. canutus*), oystercatcher (*H. ostralegus*), pintail (*A. acuta*), shelduck (*T. tadorna*), and teal (*A. crecca*) (over winter); and an internationally important waterbird assemblage. The site is a large, funnel-shaped, sheltered estuary that supports extensive areas of intertidal sandflats, mudflats and saltmarsh. The site is of major importance for waterbirds. During the winter, the intertidal flats and saltmarshes provide feeding and roosting sites for

Site Name	Distance and Direction	Qualifying Features and Site Description
		large populations of ducks and waders. In summer, the site supports breeding populations of two species of terns at levels of European importance. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain.
Mersey Estuary SPA	33 km SE from Lennox platform	**Birds Directive (2009/147/EC). Natura 2000 site** **Regularly occurring migratory species** - Redshank (*T. totanus*), black tailed godwit (*L. limosa islandica*), dunlin (*C. alpina*), golden plover (*P. apricaria*), pintail (*A. acuta*), shelduck (*T. tadorna*), teal (*A. crecca*). **Waterbird assemblage** including all species above. **Qualifying features:** Golden plover (*P. apricaria*) over winter, and migratory redshank (*T. totanus*) and ringed plover (*.hiaticula*) on passage, dunlin (*.alpina alpina*), pintail (*A. acuta*), redshank (*T. totanus*), shelduck (*T. tadorna*), and teal (*A. crecca*) over winter, and is a wetland of international importance. The Mersey is a large, sheltered estuary comprising large areas of saltmarsh and extensive intertidal sand- and mudflats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs. Intertidal flats and saltmarshes provide feeding and roosting sites for large populations of water birds. During the winter, the site is of major importance for ducks and waders. The site is also important during the spring and autumn migration periods, particularly for wader populations moving along the west coast of Britain.
Morecambe Bay and Duddon Estuary SPA	33 km east € from Lennox platform	**Birds Directive (2009/147/EC). Natura 2000 site** **Annex I species** - Common tern (*S. hirundo),* little tern (*S. albifrons),* sandwich tern (*S. sandvicensis*), bar-tailed godwit (*L. lapponica*), golden plover (*P. apricaria*), little egret (*Egretta garzetta*), whooper swan (*C. cygnus).* **Regularly occurring migratory species** - Redshank (*T. totanus*), black tailed godwit (*L. limosa islandica*), curlew (*N. arquata),* dunlin (*C. alpina alpina*), grey plover (*P. squatarola*), knot (*C. canutus),* oystercatcher (*H. ostralegus*), pintail (*A. acuta*), shelduck (*T. tadorna*), lesser black-backed gull (*L. fuscus*), pink-footed goose (*A. brachyrhynchus),* Herring gull *(L. argentatus*). **Waterbird assemblage** including all species above as well as Mediterranean gull (*Ichthyaetus melanocephalus*), ringed plover (*C. hiaticula*), ruff (*C. pugnax*), sanderling (*C. alba*), turnstone (*Arenaria interpres). **Seabird assemblage** (breeding).* **Qualifying features:** Little tern (*S. albifrons*) and sandwich tern (*S. sandvicensis*) in the breeding season; bar-tailed godwit (*.lapponica*) and golden plover (*P. apricaria*); migratory herring gull (*L. argentatus*) and lesser black-backed gull (*L.fuscus*) (breeding season), ringed plover (*C. hiaticula*) and sanderling (*C. alba*) (on passage), and curlew (*N. arquata*), dunlin (*C. alpina alpina*), grey plover (*P. squatarola*), knot (*C. canutus*), pink-footed goose (*A.

Site Name	Distance and Direction	Qualifying Features and Site Description
		brachyrhynchus), pintail (*A. acuta*), redshank (*T totanus*), shelduck (*T. tadorna*), and turnstone (*Arenaria interpres*) (over winter); and an internationally important waterbird assemblage and seabird assemblage. Mussel (*Mytilus edulis*) beds and banks of shingle are present, and locally there are stony outcrops. The flats contain an abundant invertebrate fauna that supports many of the waterbirds using the bay. The bay supports large numbers of birds. The site is of European importance throughout the year for a wide range of bird species. In summer, areas of shingle and sand hold breeding populations of terns, whilst very large numbers of geese, ducks and waders not only overwinter, but (especially for waders) also use the site in spring and autumn migration periods. The bay is of particular importance during migration periods for waders moving up the west coast of Britain.
Dee Estuary / Aber Dyfrdwy SAC	23 km SE from Hamilton platform	**Habitats Directive (92/43/EEC). Natura 2000 site** Primary reason for selection **Annex I habitats** - Mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) **Qualifying features** **Annex I habitats** - Estuaries, annual vegetation of drift lines, vegetated sea cliffs of the Atlantic and Baltic coasts, embryonic shifting dunes, "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"), "fixed coastal dunes with herbaceous vegetation ("grey dunes")", humid dune slacks **Annex II species** - Sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*), petalwort (*Petalophyllum ralfsii*). **Qualifying features:** Mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows (*G. maritimae*), sea lamprey (*P. marinus*), river lamprey (*L. fluviatilis*), and petalwort (*P. ralfsii*). The Dee Estuary is one of the largest estuaries in the UK, with an area of over 14,000 ha (140 km2). The intertidal area is dominated by mudflats and sandflats with the remainder being largely saltmarsh. The features are distributed throughout the SAC with no single feature occupying the entire SAC and with features overlapping in some locations.
Shell Flat and Lune Deep SAC	21 km N from Lennox platform	**Habitats Directive (92/43/EEC)** Primary reason for selection **Annex I habitats** - Sandbanks which are slightly covered by sea water all the time, reefs. **Qualifying features:** Sandbanks which are slightly covered by sea water all the time and reefs. The site is characterised by a deep-water channel (Lune Deep) and a large sandbank feature (Shell Flat) surrounded by shallower areas to the

Site Name	Distance and Direction	Qualifying Features and Site Description
		north and south. These features are considered good representatives of boulder and cobble reefs, and sandbanks found in the eastern part of the Irish Sea.
Menai Strait and Conwy Bay SAC	15 km SW	**Qualifying features:** Sandbanks which are slightly covered by sea water all the time, Mudflats and sandflats not covered by seawater at low tide, and reefs. The unique physiographic conditions make this an unusual site, which has long been recognised as important for marine wildlife. The variation in physical and environmental conditions throughout the site, including rock and sediment type, aspect, water clarity and exposure to tidal currents and wave action result in a wide range of habitats and associated marine communities. Many of these community types are unusual in Wales.
Morecambe Bay SAC	33 km NE from Lennox platform	**Habitats Directive (92/43/EEC)** Primary reason for selection **Annex I habitats** - Estuaries, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays, perennial vegetation of stony banks, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows *(G. maritimae*), shifting dunes along the shoreline with *Ammophila arenaria* ('White dunes'), fixed dunes with herbaceous vegetation ('Grey dunes'), humid dune slacks **Annex II species** - Great crested newt (*Triturus cristatus*) Qualifying features **Annex I habitats** - Sandbanks which are slightly covered by sea water all the time, coastal lagoons, reefs, embryonic shifting dunes, Atlantic decalcified fixed dunes (*Calluno-Ulicetea*), dunes with *Salix repens ssp. argentea* (*Salicion arenariae*). **Qualifying features**: Estuaries, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays, perennial vegetation of stony banks, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows *(G. maritimae),* shifting dunes along the shoreline with *A. arenaria* (white dunes*),* fixed dunes with herbaceous vegetation (grey dunes), humid dune slacks, and great crested newt. The site encompasses the second largest embayment in Britain. Particularly high numbers of various polychaete worms, bivalve molluscs and crustaceans are present, and the mudflats of the Walney Channel support intertidal seagrass, which is the only example in North West England. Areas of coarse sediment, boulders and cobbles create intertidal reefs, known locally as ‘skears’, that provide a hard substrate for dense beds of mussel and provide important feeding habitats for a variety of fish and bird species. The stony reefs support additional species such as the honeycomb worms, *Sabellaria* spp., and in the sheltered waters of the Walney Channel the cobbles and coarse sediments support important communities of sponges and sea squirts.

Site Name	Distance and Direction	Qualifying Features and Site Description
North Anglesey Marine SAC	40 km SW from	**Qualifying features**: Harbour porpoise *(Phocoena phocoena).* The site, containing sections of both Welsh territorial and offshore waters, covers an area of 3,249 km2. The site surrounds the island of Anglesey, extending into the Irish Sea. Although defining habitats of cetaceans can be problematic due to their mobile nature, the area is thought to contain persistently high densities of harbour porpoise, particularly during the summer.
Great Orme's Head / Pen y Gogarth SAC	28 km SW from Douglas complex	**Habitats Directive (92/43/EEC)** Primary reason for selection **Annex I habitats** - European dry heaths, semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). Qualifying features **Annex I habitats** - Vegetated sea cliffs of the Atlantic and Baltic coasts.
Martin Mere Ramsar site	12 km E	**Ramsar Criteria: 5 and 6** The outstanding importance of Martin Mere is as a refuge for its large and diverse wintering, passage and breeding bird community. The site consists of large areas of open water with muddy margins associated with seasonally flooded grazing marsh and reed swamp. There are also large areas of surrounding damp species-rich grassland and semi-improved areas of damp grassland maintained by grazing.
The Dee Estuary Ramsar site	24 km SE from Douglas platform	**Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Natura 2000 site** The site qualifies under Criterion 1 because it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographical region. The site qualifies under Criterion 2 because it supports vulnerable, endangered, or critically endangered species or threatened ecological communities, i.e. a breeding colony of the vulnerable natterjack toad (*Bufo calamita*). The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds. The site qualifies under Criterion 6 because it regularly supports 1% of the individuals in the populations of certain waterbirds in any season. The Dee is one of the top ten estuaries in the UK for wintering and passage waterfowl populations. The estuary supports internationally important numbers of waterfowl and waders. The estuary supports extensive areas of intertidal sand and mudflats as well as saltmarsh. The site includes the three sandstone islands of Hillbre (Hillbre islands group covering 5 m^2 in the mouth of the river Dee) with their important cliff vegetation and maritime heathland/grassland, the sand dune system between the Point of Ayr and Prestatyn in Wales and Red Rocks in England, various Welsh coastal fields

Site Name	Distance and Direction	Qualifying Features and Site Description
		historically reclaimed from the estuary but used by the Dee Estuary wintering waterfowl populations, freshwater lagoons and reedbeds at Shotton supporting the largest common tern breeding colony in Wales and freshwater lagoons at Inner Marsh Farm used by waterfowl throughout the year but particularly in winter. The peat and clay exposures are home to burrowing clams, crabs and anemones. The zone protects blue mussel beds and exposed peat and clay beds.
Mersey Narrows and North Wirral Foreshore Ramsar site	21 km SE from Lennox platform	**Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Natura 2000 site** The site qualifies under Criterion 4 because it regularly supports plant and/or animal species at a critical stage in their life cycles or provides refuge during adverse conditions. The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds. The site qualifies under Criterion 6 because it regularly supports 1% of the individuals in the populations of certain waterbirds in any season. The site comprises intertidal habitats at Egremont foreshore on the south bank of the Mersey, man-made saline and freshwater lagoons at Seaforth on the north bank and the extensive intertidal flats at North Wirral Foreshore. Egremont is most important as a feeding habitat for waders at low tide whilst Seaforth is primarily a high tide roost site. North Wirral Foreshore supports large numbers of feeding waders at low tide and also includes important high tide roost sites, it is an area of intertidal sands and mudflats with embryonic saltmarsh.
Ribble and Alt Estuaries Ramsar site	7 km NE from Lennox platform	**Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat** The site qualifies under **Criterion 2** because it supports vulnerable, endangered, or critically endangered species or threatened ecological communities, i.e. site supports up to 40% of the GB population of natterjack toad (*B. calamita*). The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds. The site qualifies under Criterion 6 because it regularly supports 1% of the individuals in the populations of certain waterbirds in any season. The site consists of extensive sand and mudflats backed, in the north, by the saltmarsh of the Ribble Estuary and, to the south, the sand dunes of the Sefton Coast, which lies between Formby Point and Crosby Beach, covering an area of approximately 13 km^2 between the high and low water tide marks. The site holds peat and clay exposures that hold burrowing clams, crabs, mussels and periwinkles and worms. The tidal flats and saltmarsh support internationally important populations of waterfowl in winter and the sand dunes support vegetation communities and amphibian populations of international importance.

Site Name	Distance and Direction	Qualifying Features and Site Description
Morecambe Bay Ramsar site	21 km NE	**Ramsar Criteria: 4, 5, and 6** Morecambe Bay represents the largest continuous intertidal area in Britain. The site consists of intertidal mud and sandflats, with associated saltmarshes, shingle beaches and other coastal habitats. It is a component in the chain of west coast estuaries of outstanding importance for passage and overwintering waterfowl (supporting the third-largest number of wintering waterfowl in GB), and breeding waterfowl, gulls and terns.
Mersey Estuary Ramsar site	31 km SE from Lennox platform	**Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Natura 2000 site** The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds. The site qualifies under Criterion 6 because it regularly supports populations of waterbirds at internationally important levels. A large, sheltered estuary comprising large areas of saltmarsh and intertidal sand and mudflats. The site includes brackish marsh, rocky shoreline, and cliffs set in a rural and industrial environment. Internationally important numbers of various species of waterbirds feed and roost at the site in winter, or stage at the site in spring and fall, notably ringed plover (*C. hiaticula*).
Conwy Royal Society for the Protection of Birds (RSPB) Reserve	32 km SW from Douglas complex	**RSPB Reserve**. The lagoons provide a refuge for thousands of waders that move off the estuary at high tide. Vegetation on the islands is cut short each autumn to make them suitable for roosting curlews, redshanks and grazing wigeons. The southern half of the reserve is grazed year-round by Carneddau mountain ponies, a hardy local mountain breed.
Dee Estuary RSPB Reserve	24 km SE from Hamilton platform	**RSPB reserve** comprising: **Point of Ayr** - Mosaic of naturally formed coastal habitats, with sand and shingle beach, dunes and saltmarsh all supporting important wildlife at different times of the year. **Parkgate** - Extensive saltmarsh that hosts nesting skylarks and redshanks in spring and summer, and thousands of wildfowl and wading birds in winter. **Burton Mere Wetlands** - Rich wet grassland with shallow scrapes and lagoons create a home for a variety of wading birds and wildfowl. A modest reedbed supports an abundance of warblers in spring and provides good feeding areas for herons, egrets and kingfishers.

Site Name	Distance and Direction	Qualifying Features and Site Description
Hesketh Out Marsh, Ribble Estuary RSPB reserve	20 km NE from Lennox platform	**RSPB Reserve**. The reserve creates new saltmarsh habitat for wildlife and builds stronger flood resilience for the local community.
Mersey Estuary RSPB Reserve	36 km SE from Lennox platform	The site is internationally important for three species of duck and four species of wading bird. The estuary is a vital link in the chain of migration that sustains many birds through the winter and is also a popular and important breeding ground for skylarks and redshanks, as well as colonies of gulls.
Marshside RSPB reserve	12 km NE from Lennox platform	Protects 155 ha of coastal grassland and pools, and 230 ha of saltmarsh on the shores of the Ribble estuary. Protects important populations of breeding waders and wintering wildfowl, plus other wildlife such as brown hares and wintering birds of prey.
Sefton Coast SAC/SSSI	7 km NE from Lennox platform	**Habitats Directive (92/43/EEC)** Primary reason for selection **Annex I habitats** - Embryonic shifting dunes, shifting dunes along the shoreline with *A. arenaria* ('White dunes'), fixed dunes with herbaceous vegetation ('Grey dunes'), dunes with *Salix repens ssp. argentea* (*S. arenariae*), humid dune slacks. **Annex II species** - Petalwort (*P. ralfsii*) **Qualifying features** **Annex I habitats** - Atlantic decalcified fixed dunes (Calluno-Ulicetea) **Annex II species** - Great crested newt (*T. cristatus*) The site is of special interest for intertidal mud and sandflats, embryonic shifting dunes, mobile dunes, dunes with creeping willow *Salix arenaria*, humid dune slacks, fixed dunes, dune grasslands and dune heat. Small areas of saltmarsh are also present. Its assemblages of vascular and non-vascular plants, in particular the nationally rare grey hair grass *(Corynephorus canescens*), nationally scarce liverwort *(Petalophyllum ralfsii*) and nationally rare moss *(Bryum neodamense*), are also of special interest. The site is of special interest for its populations of internationally important wintering waterfowl and its nationally and, in some cases, internationally important populations of individual waders. Its populations of sand lizard *(Lacerta agilis*), natterjack toad (*B. calamita)* and great-crested newt (*T. cristatus)* are also of special interest, along with the populations of the Red Data Book species, sandhill rustic moth (*Luperina nickerlii gueneei)*.

Site Name	Distance and Direction	Qualifying Features and Site Description
		The Sefton coast is also of special interest for coastal geomorphology, in particular for the large, mobile dune system and the multiple sand bars that occur on the foreshore. Relatively stable bar features occur in the intertidal zone and many different bedforms are represented on the foreshore.
Dee Estuary / Aber Afon Dyfrdwy SSSI	24 km SE from Hamilton platform	Dee Estuary SSSI is of special interest for its total populations of internationally important wintering waterfowl; its populations of individual waterfowl and tern species whose numbers reach national and in some cases, internationally important levels; its intertidal mud and sandflats, saltmarsh and transitional habitats; the hard rocky sandstone cliffs of Hilbre Island and Middle Eye with their cliff vegetation and maritime heathland and grassland; its assemblage of nationally scarce plants; and its populations of sandhill rustic moth (*L. nickerlii gueneei),* a Red Data Book species.
Lune Estuary SSSI	35 km NE from Lennox platform	As part of Morecambe Bay, the site forms a major link in the chain of estuaries along the west coast of Britain used by birds on migration between the breeding grounds in the far north, and the wintering grounds further south and is of international importance for the passage and wintering waterfowl it supports. As a whole the site regularly supports internationally important numbers of wintering oystercatcher (11,650), grey plover (1,350), turnstone (850), knot (18,500), and pink-footed geese (8,700), and nationally important numbers of curlew (920), redshank (1,370) and dunlin (6,700).
Mersey Estuary SSSI	35 km south-southeast (SSE) from Lennox platform	An internationally important site for wildfowl and consists of large areas of intertidal sand and mudflats. The site also includes an area of reclaimed marshland, salt-marshes, brackish marshes and boulder clay cliffs with freshwater seepages. The Manchester Ship Canal forms part of the southern boundary of the site and separates a series of pools from the main estuary. These pools together with Hale Marsh are important roosting sites for wildfowl and waders at high tide. Throughout the winter the estuary supports large numbers of wildfowl and waders. The birds feed on the rich invertebrate fauna of the intertidal sediments as well as plants and seeds from the salt-marsh and adjacent agricultural land. The estuary is also a valuable staging post for migrating birds in spring and autumn.
New Ferry SSSI	31 km SE from Lennox platform	Site is designated for its large areas of intertidal sand, mudflats and other habitats, which support two nationally important species of wintering waterfowl, pintail *Anas acuta* and black-tailed godwit (*L. limosa)*.
North Wirral Foreshore SSSI	21 km SE from Lennox platform	This site is an area of intertidal sand and mudflats and embryonic saltmarsh which is of considerable importance as a feeding and roosting site for passage and wintering flocks of waders, wildfowl, terns and gulls. Site supports significant wintering populations of knot (20,000+), bar-tailed godwit (2,000+) and dunlin (10,000+) which regularly exceed 1% of their total British and Irish wintering populations.

Site Name	Distance and Direction	Qualifying Features and Site Description
Ribble Estuary SSSI	7 km NE from Lennox platform	Site covers extensive intertidal sand-silt flats with one of the largest areas of grazed greenmarsh in Britain and includes small areas of recently reclaimed saltmarsh. The estuary is of international importance for the passage and wintering waterfowl it supports, being a major link in the chain of estuaries down the west coast of Britain used by birds on migration between the breeding grounds in the far north and their wintering grounds further south. The estuary supports internationally important numbers of the following waterfowl: Bewick's swan, pink-footed goose, shelduck, wigeon, oystercatcher, knot, sanderling, dunlin, blacktailed and bar-tailed godwit as well as smaller populations of lapwing, curlew, grey plover and golden plover.
Wyre Estuary SSSI	33 km NE from Lennox platform	Site is one of the two largest areas of intertidal estuarine flats in Britain (the other being the Wash). The whole estuarine complex is of international significance for wintering wading birds and of national significance for wintering wildfowl. The Wyre in its own right is of national importance for wintering and passage black-tailed godwit, wintering turnstone (numbers exceeding 1% of the British population) and for wintering teal in times of hard weather.
Aber Afon Conwy SSSI	30 km SW from Douglas complex	Site is of special interest for its marine and terrestrial invertebrate biology.
Arfordir Gogleddol Penmon SSSI	40 km SW from Douglas complex	Site is selected for its geological, botanical, ornithological and marine biological features.
Creigiau Rhiwledyn / Little Orme's Head SSSI	26 km SW from Douglas complex	Site is of special scientific interest for its geological, botanical, ornithological and marine biological features.
Glannau Penmon – Biwmares SSSI	40 km SW from Douglas complex	Site is selected for its geological and marine biological features.
Gronant Dunes and Talacre Warren SSSI	24 km SW from Douglas complex	Site is of special interest for botanical, entomological and ornithological reasons. These dunes, in combination with other associated coastal habitats, represent the only significant remnant of what was once an extensive dune system along the north coast of Wales.
Pen y Gogarth / Great Orme's Head SSSI	28 km SW from Douglas complex	Site is of special interest for its geological, botanical, entomological, ornithological and marine biological features.

Site Name	Distance and Direction	Qualifying Features and Site Description
Puffin Island / Ynys Seiriol SSSI	38 km SW from Douglas complex	Site is principally of interest for its nesting seabirds breeding both on its sea-cliffs and open grassland areas.
Traeth Lafan SSSI	39 km SW from Douglas complex	This large intertidal area contains a range of habitats from sands exposed to waves and tidal currents at the seaward edge to sheltered sand and mudflats. Freshwater streams flowing across the area add to the diversity. Dwarf eelgrass *Zostera noltii* occurs near Aber. The abundant invertebrate fauna of species such as *Cyathura* and *Scrobicularia* attracts large flocks of birds. For wintering waders this is the third most important ground in Wales, with an annual peak of 10,000-14,000 waders of ten species. In addition, there are up to 1,500 wintering duck. The sands are of national importance for their assemblies of moulting great-crested grebes and red-breasted mergansers and are regionally important for shelduck.
Traeth Pensarn SSSI	27 km SW from Douglas complex	Site is of special botanical interest for its vegetated shingle beach plant communities. The site support both 'pioneer' and 'stable vegetated' shingle, extending approximately 1.7km along the Pensarn beach, from the promenade westward towards Llanddulas.
Ainsdale Sand Dunes NNR	7 km SE from Lennox platform	<u>Designated features:</u> Conifer plantation; BAP species - red squirrel (*Sciurus vulgaris*) GCR geomorphology site Great crested newt (*T. cristatus*) Fixed dune grassland Landscape and archaeology Littoral Sediment - Mudflats, sand flats Natterjack Toad (*E. calamita*) Sand dune - strandline, embryo and mobile dunes Supralittoral sediment - dune slack Supralittoral sediment - aggregations of non- breeding birds Supralittoral sediment - dune heath Supralittoral sediment; sand dune - breeding birds Supralittoral sediment; sand dune - fungiaassemblage

Site Name	Distance and Direction	Qualifying Features and Site Description
		Supralittoral sediment; sand dune - invertebrate assemblage Supralittoral sediment; sand dune - non-vascular plants Supralittoral sediment; sand dune - vascular plant assemblage Sand lizard (*Lacerta agilis*)
Cabin Hill NNR	12 km SE from Lennox platform	<u>Designated features:</u> Fixed dune grassland Littoral sediment - mudflats, sand flats above mean highwater Mixed woodland - red squirrel (*S. vulgaris*) Natterjack toad (*E. calamita*) Sand dune; strandline, embryo and mobile dunes Supralittoral sediment; dune slacks Supralittoral sediment; sand dune - breeding birds Supralittoral sediment; sand dune - fungi assemblage Supralittoral sediment; sand dune - invertebrate assemblage Supralittoral sediment; sand dune - non vascular plant assemblage Supralittoral sediment; sand dune - vascular plant assemblage Supralittoral sediment; sand flats aggregations of non-breeding birds Sand lizard (*L. agilis*)
Ribble Estuary NNR	9.5 km NE from Lennox platform	<u>Designated features:</u> Coastal grazing marsh Inter-tidal saltmarsh Landscape and historical features Lesser black-backed gull Littoral sediment invertebrates Saltmarsh - a seabird assemblage of international importance

Site Name	Distance and Direction	Qualifying Features and Site Description
		Saltmarsh - non breeding birds (Annex 1 Species) Saltmarsh - breeding birds (Annex 1 species) Saltmarsh - breeding Birds of Conservation Concern and BAP species Saltmarsh; littoral sediment - Internationally significant migratory birds (waterfowl) Saltmarsh; littoral sediment - Internationally significant populations of regularly occurring migratory bird species Saltmarsh; non-breeding birds - migratory species (curlew, lapwing) Saltmarsh - nationally important breeding bird populations
Maes-Y-Facrell, Pen Y Gogarth NNR	29 km SW from Douglas complex	Site is designated for its biological and geological interest, and contains a mosaic of flower-rich grassland, and fragments of limestone pavement. Site is home to a number of special and rare plants; spiked speedwell (*Veronica spicata*), Orme berry (*Cotoneaster cambricus*), bloody cranesbill (*Gerineum sangineum*) and dark red helleborine (*Epipactis atrorubens*). Because of the great diversity of wildflowers, insect life is also abundant, and several endangered species of butterflies and moths occur including the silver-studded blue butterfly (*Plebejus argus*), silky wave moth (*Idaea dilutaria*) and also the grayling (*Hipparchia semele*).
Ainsdale and Birkdale Hills LNR	8 km E from Lennox platform	One of the largest areas of wild dunes left in Britain. It has high dune ridges and dune valleys containing slacks, some with pools which provide breeding habitat for Natterjack toads. The reserve is rich in plant life. In winter part of the site is grazed by Hebridean sheep. The damp dune slacks are carpeted with flowers in summer including early marsh orchid, marsh helleborine orchids and grass of Parnassus. The drier slacks have round leaved wintergreen and the nationally rare dune helleborine orchid.
Hilbre Islands LNR	25 km SE from Hamilton platform	The islands are used as roost sites by the wildfowl and waders of Dee Estuary when the tide covers the thousands of acres of flats which are exposed at low water.
Ravenmeols Hills LNR	10 km E from Lennox platform	Wide sandy beach, high dunes, furrowed grassland that were once asparagus fields, scrubby areas of deciduous trees and a belt of pinewoods. Important site for Natterjack Toads which inhabit the dunes.
Bodlondeb Woods LNR	33 km south (S) from Douglas complex	Site is composed of mixed woodland lying on acidic rock. Native oak, birch and ash are present but in the past there has been extensive planting of beech, scots pine and evergreen oak. Sycamore is abundant in the wood with cherry and yew also growing. Within the woods is an unusual feature, a holly alley.

Site Name	Distance and Direction	Qualifying Features and Site Description
		The wood is home to a variety of mammals, birds and butterflies, including grey squirrel, fox, buzzard, sparrow hawk, nuthatch, jay, common blue, speckled wood and occasionally painted lady.
Great Orme's Head LNR	28 km S from Douglas complex	The sea cliffs, limestone grassland, heathland and woodland support an enormous variety of wildflowers and invertebrates, many of which are rare and unusual. The wide range of flowers on the Great Orme provide food for many different species of butterfly, and during the summer months clouds of butterflies can often be seen (a rare sight in many parts of the country). Also, throughout the summer months the spectacular cliffs host breeding colonies of seabirds such as guillemots, kittiwakes and razorbills. Ravens and little owls also inhabit the more remote cliff areas.
Gronant Dunes LNR	24 km SE from Douglas complex	These dunes, in combination with other associated coastal habitats, represent the only significant remnant of what was once an extensive dune system along the north coast of Wales. The reserve has seen sand lizards and natterjack toads reintroduced and is the only Little Tern breeding colony in North Wales making it a haven for wildlife. The sand dunes also provide a diminished habitat to dune plants including the nationally rare dune fescue.
Kinmel Dunes LNR	25 km S from Douglas platform	Site is one of the few surviving fragments of sand dune in the locality. This small sand dune system is home to a variety of native maritime plants such as the attractive sea holly, bird's foot trefoil, common restharrow and lucerne. Seals can sometimes be seen close to the shore and bird life includes the skylark, kestrel and ringed plover.
Traeth Lafan LNR	39 km SW from Douglas platform	Site contains a mix of shoreline habitats, and approximately 2,500 hectares of intertidal sand and mud flats which are exposed at low tide. An important area for a number of species, including moulting great crested grebes, oyster catchers, red breasted mergansers and golden eye.

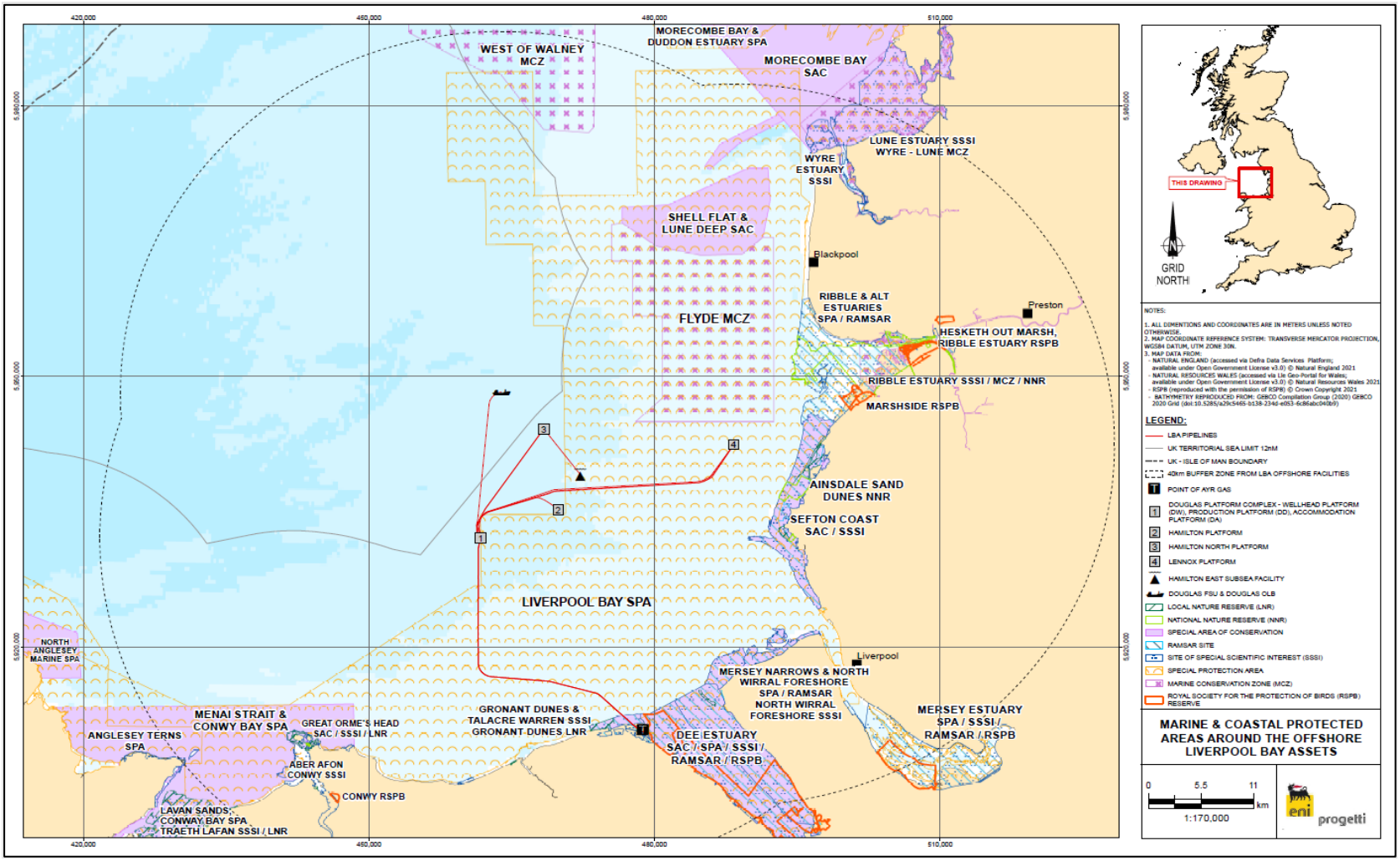

Figure 6-2 Marine and Costal Protected Areas in the Vicinity of the LBA

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6.3 Physical Environment

6.3.1 Bathymetry

Water depths across Liverpool Bay are generally less than 50 m and the seabed is essentially flat and featureless with no discernible bedforms (RBA, 2005). Water depths near to the Douglas Platform are predominantly around 20 to 25 m (Hartley Anderson,2009), as presented in Figure 6-3 (Bist LLC, 2023).

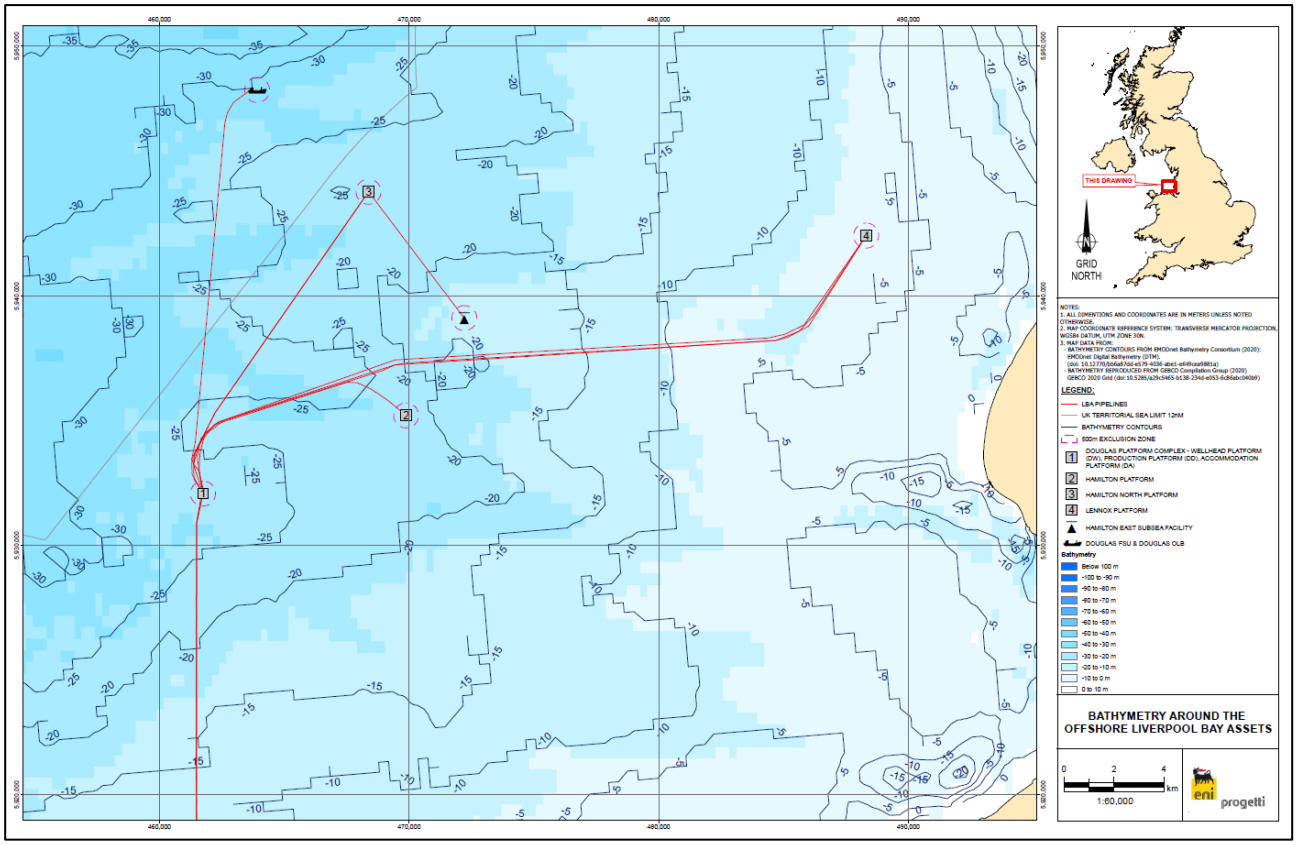

Figure 6-3 Bathymetry Around LBA Field

Substantial fields of sandwaves and sand ripple bedforms are present in the Irish Sea, particularly between the Republic of Ireland and Welsh coasts. In the Irish Sea, sandbanks are located in the mouths of estuarine areas (Solway, Ribble, Morecambe Bay), around headlands (Llyn Peninsula), off North Wales, and to the east of the Isle of Man (DECC, 2016).

Seabed formations within Liverpool Bay are predominantly characterised by sand ribbons of heights less than 30 cm and sand wave fields with a height of less than 2 m with lengths between 10 m and 20 m. Less frequently, individual sand waves can occur with heights of up to 12 m.

The Shell Flat and Lune Deep SCI is located to the south of the entrance to Morecambe Bay and is partly designated for the Shell Flat banner bank, which forms a continuous structure 15km east to west at a depth of approximately 20m. The bank comprises a range of mud and sand sediments from silts and clays through to coarse sands (DECC, 2016).

Other sand dominated bedforms range from tidal-parallel sand ribbons to larger transverse barchan-type sand waves and extensive sand patches with smaller sandwaves.

6.3.2 Sediment Characteristics

Sediment was characterised by a predominance of sand across the survey area as a whole. While the OSB stations had very little gravel content, all other stations showed variable contributions of gravel and mud. The percentage contribution of gravels (> 2 mm), sands (0.63 mm to 2 mm), and fines (< 63 µm) at each station are presented in Figure 6-4. The mean proportion (± Standard Error [SE(b)]) of sands across all stations was 83 % (± 2), the mean (± SE(b) gravel and mud content across the survey area was 7 % (± 1) and 10% (± 1) respectively. A clear spatial pattern was evident in the distribution of mean grain size across the survey area with coarser sediments characterising stations located within the western reaches of the Welsh survey area Figure 6-4).

A spatial pattern was observed in sediment grain size at decommissioning stations, with finer sediments typically found in proximity of platforms. This could be associated with a remanence of drill cuttings in and around the platforms which are typically made of fine sediments (Figure 6-4).

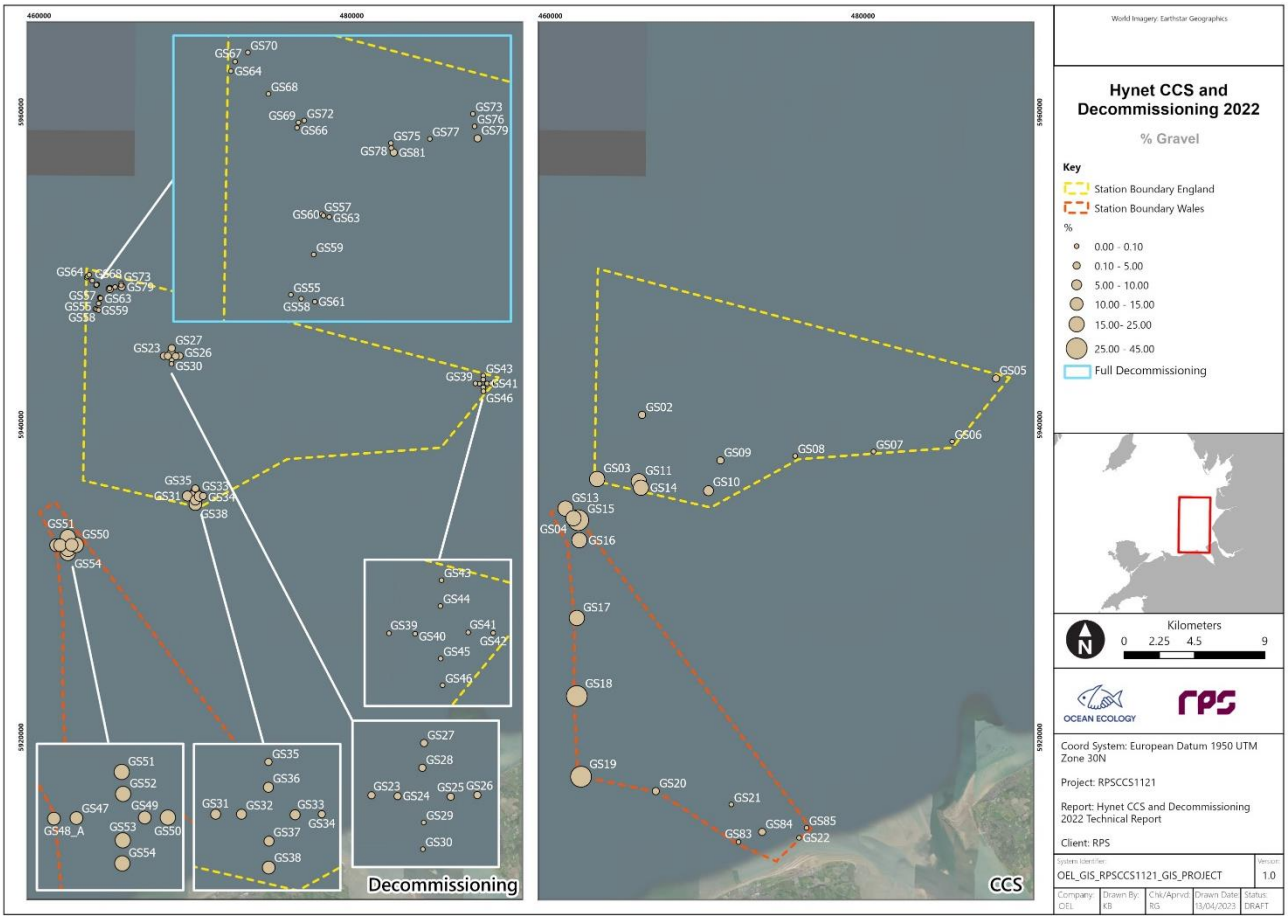

Figure 6-4 Percentage of Gravel (> 2mm) at each Sampling Station

6.3.3 Sediment Hydrocarbon Content

6.3.3.1 Total Hydrocarbon Content (THC)

The THC in sediment samples collected from partial decommissioning stations ranged from 1,320 µg kg^{-1} at station GS23 to 30,600 µg kg^{-1} at station GS36 with an average value (± SE(b) for the whole of the cruciform areas of 7,446 ± 1,205 µg kg^{-1} (Figure 6-5).

N-alkanes (saturates) in sediments had carbon chains length ranging between C12 and C37, with the dominant chains being C14 for the even-numbered chains and C31 for the odd-numbered chains. The highest concentration of total n-alkanes was recorded at station GS36, 604 µg kg^{-1}, while the lowest concentration of 18.45 µg kg^{-1} was found at station GS23.

Pristane was the highest at station GS34, 47 µg kg^{-1}, and the lowest at station GS46, 1.06 µg kg^{-1}. The highest concentration of phytane was also measured at station GS34, 13.4 µg kg^{-1}, while it was below detection limit (BDL) at thirteen stations; therefore, the Pristane/Phytane ratio could not be calculated at these thirteen stations.

The results obtained when using the Pristane and/or Phytane (Pr/Ph) ratio indicated a biogenic predominance in the source of n-alkanes (Figure 6-5) as the ratio was larger than one at all stations. Notably the Pr/Ph ratio was above three at stations GS24, GS33, GS41, GS34, GS54, GS37 and GS49 potentially indicating terrestrial inputs stemming from the Dee River.

The carbon preference index (CPI) was used to assess n-alkanes origin sources, and it was found that the origin of n-alkanes was of biogenic predominance (CPI >1) at all stations. No stations represented pyrogenic or petrogenic sources of n-alkanes.

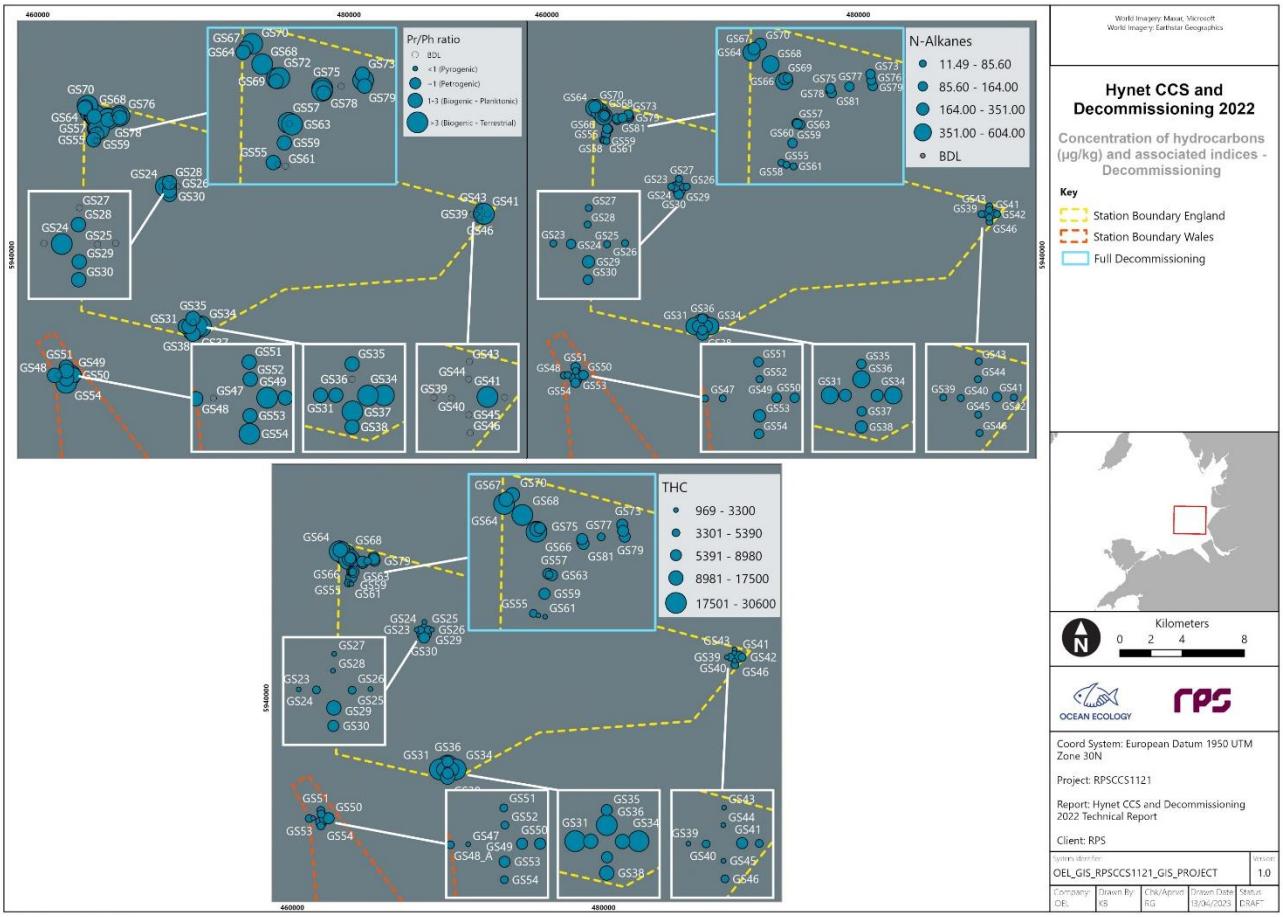

Figure 6-5 Hydrocarbon Concentrations

6.3.3.2 Polycyclic aromatic hydrocarbons (PAH)

The results of the polycyclice aromatic hydrocarbon analysis is provided in Table 6-3. The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) Action Level 1 (AL)1 was exceeded at station GS36 for both Chrysene and Benzo[a]pyrene (Figure 6-6). These two PAHs are found in coal tar and more in general can be the result of incomplete combustion of organic matter (oil and gas products). OSPAR background

assessment concentration (BAC) was exceeded at three stations for Naphthalene, two stations for Pyrene and Benzo[a]anthracene and one station for Anthracene, Benzo[k]fluoranthene and Benzo[a]pyrene. Station GS36 reported concentrations above the threshold effects level (TEL) for Acenaphthene, Fluorene, Benzo[a]anthracene, Benzo[a]pyrene and Dibenzo[a,h]anthracene.

Table 6-3 Number of Stations across the Partial Decommissioning Survey Area Exhibiting Elevated PAH Levels in comparison to Reference Levels

Analyte	CEFAS	OSPAR		CSQG(1)	
	AL1	BAC	ERL(2)	TEL	PEL(3)
Naphthalene	0	3	0	0	0
Acenaphthylene	0	-	-	0	0
Acenaphthene	0	-	-	1	0
Fluorene	0	-	-	1	0
Phenanthrene	0	0	0	0	0
Anthracene	0	1	0	0	0
Fluoranthene	0	0	0	0	0
Pyrene	0	2	0	0	0
Benzo[a]anthracene	0	2	0	1	0
Chrysene	1	-	-	0	0
Benzo[b]fluoranthene	0	0	0	-	-
Benzo[k]fluoranthene	0	1	0	0	0
Benzo[a]pyrene	1	1	0	1	0
Indeno[123,cd]pyrene	0	0	0	-	-
Dibenzo[a,h]anthracene	0	-	-	1	-
Benzo[ghi]perylene	0	0	0	-	-

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(1) CSQG – Canadian Sediment Quality Guidelines for the Protection of Aquatic Life;
(2) ERL – Effects Range - Low
(3) PEL – Probable Effect Levels

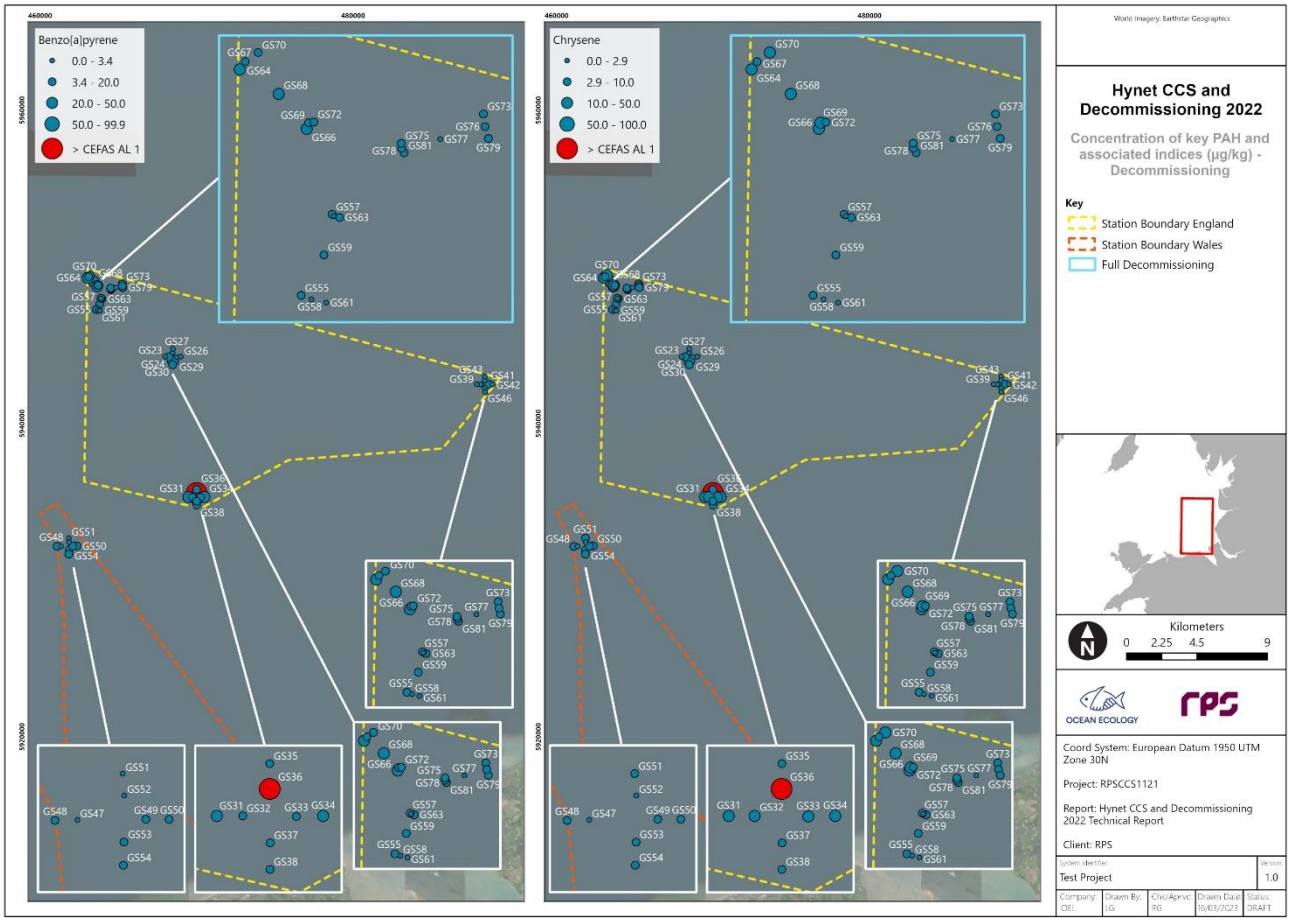

Figure 6-6 Distribution of PAHs above CEFAS AL1 Reference Levels

6.3.4 Sediment Heavy and Trace Metal Content

Raw data for the eight main heavy and trace metals (dry-weight concentration, mg kg^{-1}) measured within the partial decommissioning stations are shown in Table 6-4 and Table 6-5. Figure 6-7 shows the heavy and trace metal concentrations. Both arsenic (As) and cadmium (Cd) exceeded CEFAS AL 1 at one station. As (arsenic) was higher that CEFAS AL 1 at station GS23 whilst Cd was elevated at station GS34. As (arsenic) was also above OSPAR ERL at 29 stations and TEL at 32 stations. Cd also exceeded the OSPAR BAC at stations GS34 and GS38. Mercury (Hg) was above OSPAR BAC at four stations. None of the heavy or trace metals exceeded CEFAS AL2 guidelines.

The most abundant metal was zinc (Zn) which ranged from 25.6 mg kg^{-1} at station GS26 to 62.5 mg kg^{-1} at station GS51 with an average concentration across all stations of 37.9 mg kg^{-1} ± 1.5 mg kg^{-1}. Zinc was always recorded below reference levels at all stations.

Table 6-4 Number of Stations across the Partial Decommissioning Survey Area Exhibiting Elevated Heavy and Trace Metals Levels in comparison to Reference Levels.

Analyte	CEFAS		OSPAR		CSQG	
	AL1	AL2	BAC	ERL	TEL	PEL
Arsenic (As)	1	0	0	29	32	0
Cadmium (Cd)	1	0	2	0	0	0
Chromium (Cr)	0	0	0	0	0	0
Copper (Cu)	0	0	0	0	0	0
Mercury (Hg)	0	0	4	0	0	0
Nickel (Ni)	0	0	0	0	-	-
Lead (Pb)	0	0	0	0	0	0
Zinc (Zn)	0	0	0	0	0	0

Table 6-5 Sediment Heavy and Trace Metal Concentrations (mg kg-1). Shading indicates values above reference levels.

Station	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
GS23	20.5	0.15	7.8	5.1	0	8.4	12.1	28.3
GS24	15.6	0.07	7.5	5.9	0	8.1	13.6	34.6
GS25	14.2	0	6.7	5.8	0	9	11.9	27.9
GS26	15.4	0	5.8	5.2	0	7	11.8	25.6
GS27	17.8	0.1	7.3	6.2	0	8.3	16.6	33.4
GS28	17.9	0.05	7	5.7	0	8.6	12.6	28.8
GS29	12.5	0.12	6.9	5.6	0	7	12.6	29.7
GS30	12.7	0.12	8.2	6.7	0	8.1	13.4	33.5
GS31	8.1	0.22	10.2	7.6	0.08	10.9	11.8	38.1
GS32	9.6	0.18	13.2	8.8	0.08	12.7	14.9	43.4
GS33	8.9	0.15	11.8	9.7	0.09	10.1	12.3	36.8
GS34	9.1	0.48	13.9	8.1	0.1	11.8	17.2	48
GS35	7.4	0.22	8.3	6.2	0.01	11	11.7	33.7
GS36	8	0.2	11.9	8.9	0.05	12.5	14.1	43.4
GS37	9.3	0.3	9.3	7.7	0.03	12.7	12.8	39.4
GS38	12.6	0.32	9.8	8.7	0.03	13.9	13.1	39.6
GS39	14.8	0.15	6.1	4.7	0.02	10.2	9.1	40.8
GS40	15.7	0.04	5.6	6.1	0	15.2	10.4	43
GS41	16.3	0.14	7.1	5.5	0	16.9	11.2	59.1
GS42	13.6	0.12	7	5.4	0	15	9.3	45.6
GS43	13	0.1	6.1	5.5	0	6.7	10.5	38.6
GS44	16.5	0.17	6.7	5.1	0	6.7	10.2	37.2
GS45	14.6	0.12	6	3.9	0	8.2	8.3	34
GS46	8.7	0.09	4.3	3.2	0	4.3	6	25.7
GS47	13.2	0.2	11.6	7.6	0.03	11.5	13.6	38.1
GS48	10.5	0.25	11.2	6.2	0	10.2	12	32.6
GS49	12.1	0.21	13.7	7.7	0.01	11.8	16.2	38.8
GS50	10.6	0.23	13.1	7.1	0.01	11.5	13.4	43.4
GS51	10.4	0.25	14.8	10.5	0	14.8	13.8	62.5
GS52	9.3	0.13	13.4	6.7	0	12	13.6	38.6
GS53	11.9	0.06	11.9	6.5	0	12.6	12.3	35.2
GS54	12	0.2	12.8	6.7	0	12.1	14.3	34

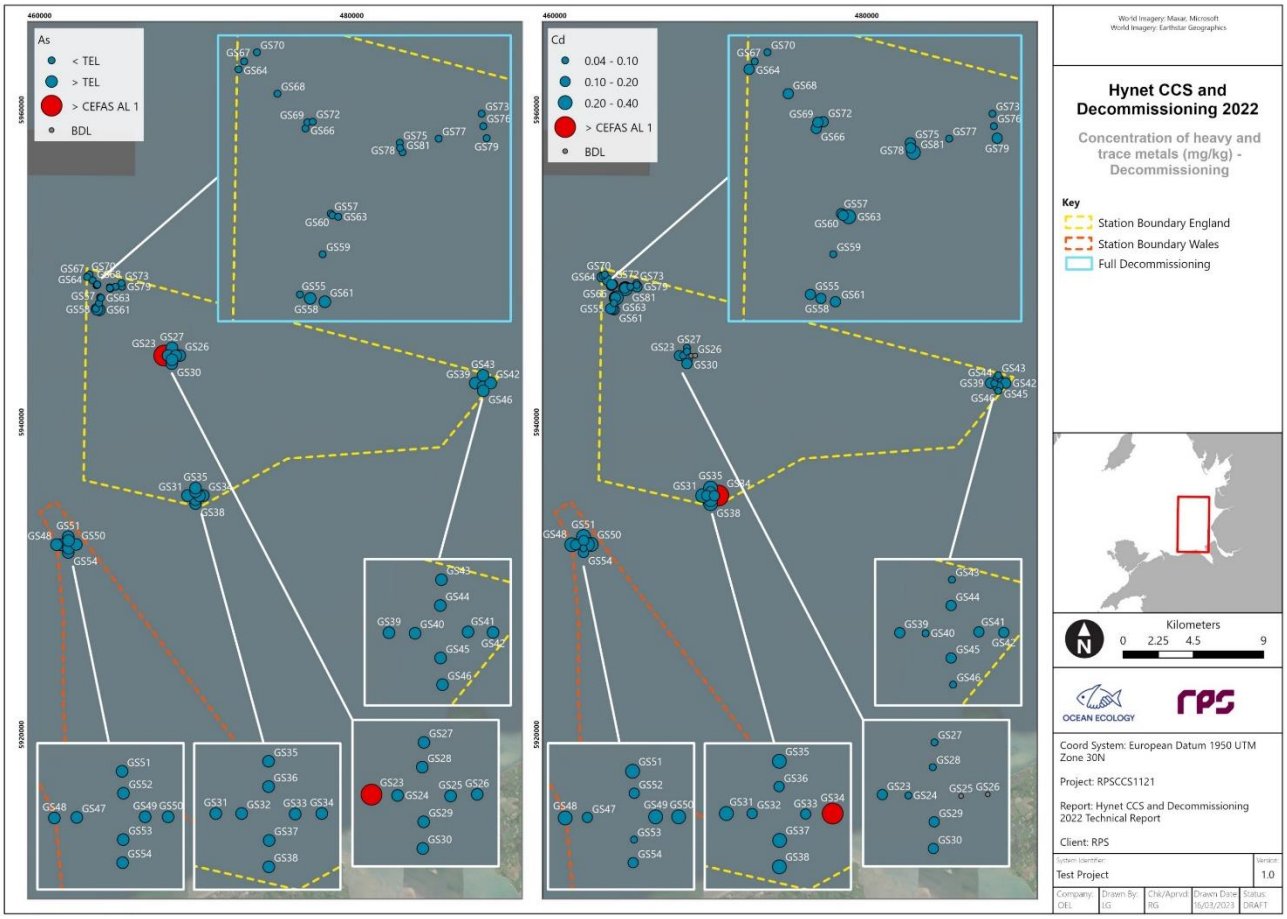

Figure 6-7 Sediment Heavy and Trace Metal Concentrations

6.3.5 Drill Cuttings

Whilst there was some evidence of remanence of drill cuttings when surveying the sediments around the assets to be partial decommissioned, no relationship was observed between the concentration of PAHs and proximity to platforms that could have indicated dispersal of the drill cuttings. No macrobenthic anomalies were identified at these locations to suggest any adverse effects were present.

6.3.6 Oceanography

The strongest currents in the area occur to the north-west of Anglesey and to the north of the Isle of Man where currents in excess of 2 m/s may occur for up to 40% of the time (ABPmer, 2023; DECC 2009). Sediment transport is predominantly by wave and tidal forces rather than storm surges (nPower Renewables, 2007)

Currents in Liverpool Bay are complicated by the influence of the river flows into the bay. To the north of Liverpool Bay the tidal currents are predominantly east to west offshore but in more coastal waters the direction changes to north-south. Current speed varies from between 0.3 m/s during neap tides to 1.0 m/s during spring tides in the Lune Channel and around Shell Flats where there is a low residual anti-clockwise current (CSFA, 2007). The strength of the current can be very location specific. The tidal range in Liverpool Bay is relatively high with an average spring tidal range of 8.4 m and at the Douglas installation it ranges from between 6.0 m and 7.0 m during the spring tides and 3.0 – 4.0 m during neap tides (ABPmer, 2023).

Tidal dynamics and plume buoyancy govern the fate of fresh water as it enters the sea, as well as that of its sediment, contaminants and nutrient loads. Freshwater forcing statistics show that on average the bay receives

233 m^3 /s of fresh water. Although the region is salinity controlled, river input temperature is shown to significantly modulate the plume buoyancy within a seasonal cycle (Ocean Dynamics, 2011).

Stratification strongly influences the region's dynamics. Data from long-term moored instrumentation are used to analyse the stratification statistics that are representative of the region. This demonstrates that for 65% of tidal cycles, the region alternates between being vertically mixed and stratified (Ocean Dynamics, 2011).

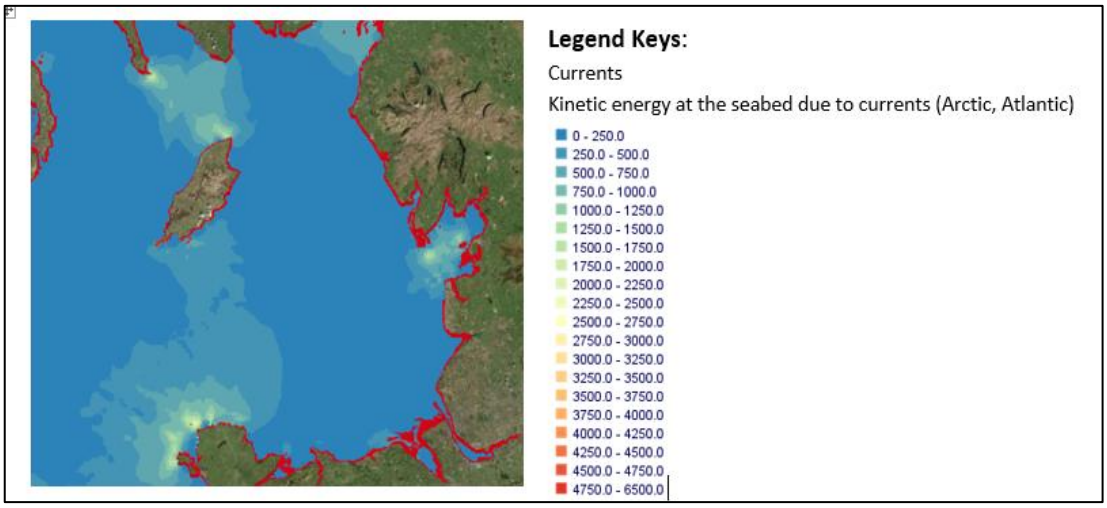

Figure 6-8 LBA Currents

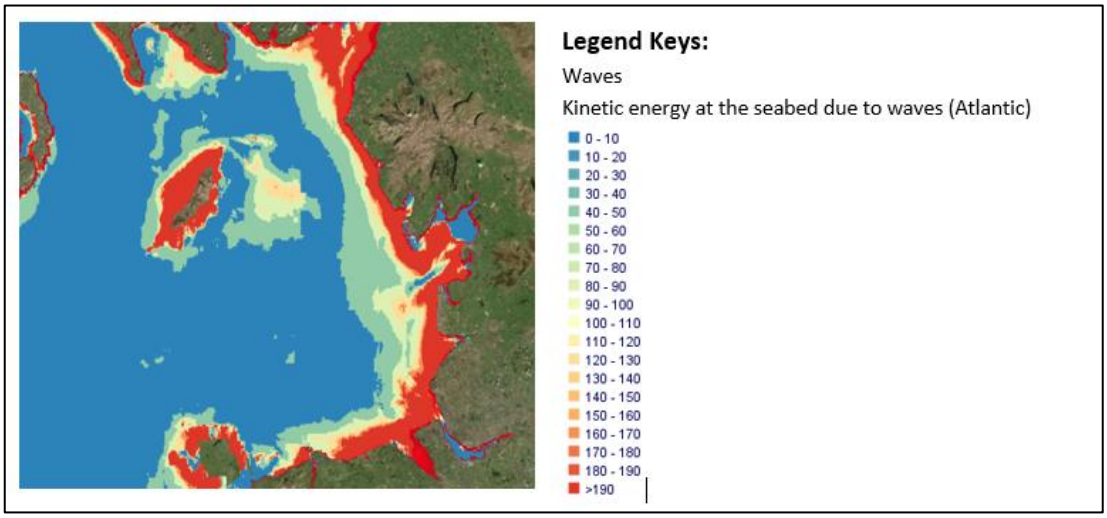

Figure 6-9 LBA Waves

6.3.7 Meteorology

Wind direction and velocity in Liverpool Bay are variable throughout the year (Figure 6-10). The prevailing winds are from the south-west and west with winds from the east being least frequent. Wind strength varies across seasons with the strongest winds of greater than 12m/s occurring most frequently during winter. During this period the gales occur predominantly from the north-west. During the summer months, wind strengths are at their weakest with winds of less than 7 m/s (ABPmer, 2023).

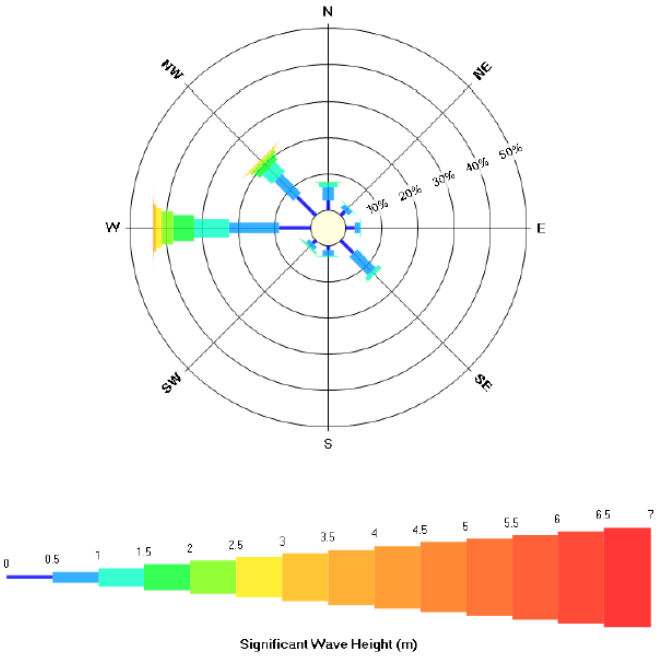

Figure 6-10: Wave Rose and Wave Frequency Distribution (direction coming from)

6.4 Biological Sensitivities

6.4.1 Plankton

Plankton forms the primary basis of the marine food chain and consists of microscopic plants (phytoplankton) and animals (zooplankton) which live freely in the water column and largely drift with the water currents. The composition and abundance of plankton communities varies throughout the year and is influenced by physical parameters such as temperature, salinity and water inflow (Beare *et al*., 2002)

The annual cycle of Plankton in Liverpool Bay is variable but usually comprises of a spring peak in phytoplankton followed by a corresponding peak in zooplankton followed by a decrease in numbers during the summer. There may be a smaller peak in the autumn before decreasing to lowest densities during the winter months. The peaks during the spring may be up to a month later (April and May) than those that occur in the North Sea. Overall numbers of plankton in Liverpool Bay are lower than elsewhere (Kennington & Rowlands, 2006; Irish Sea Study Group, 1990).

Within the Liverpool Bay area, high concentrations of phytoplankton are usual. Frontal systems in Liverpool Bay and areas of freshwater inputs from the major rivers entering the bay can be areas of relatively rich in plankton, which in turn attracts other marine life. Eutrophication caused by nutrient rich river inflow and enrichment from sewage dumping ensures highest production occurs inshore (Edwards and John, 1996).

The phytoplankton assemblage of the eastern Irish Sea is dominated by diatoms and dinoflagellates. In the spring, diatoms such as *Chaetoceros* spp., *Thalassiosira* spp. and *Lauderia borealis* are abundant. The smaller autumn peak consists mainly of *Biddulphia sinensis*. Diatom blooms consisting mainly of *Phaeocystis pouchitti* often develop in late spring or early summer in Liverpool Bay. Later in the summer, the dinoflagellate *Gyrodinium aureolum* that produces "red tides" and the luminescent dinoflagellate *Noctiluca scintillans* may occasionally form blooms in the area. Rapid bloom development, particularly of *P. pouchitti* can result in oxygen depletion in the water column (Kennington & Rowlands 2006; DECC, 2016).

The zooplankton community is dominated by crustaceans, principally copepods such as *Pseudocalanus elongatus*, *Temora longicornis* and *Acartia clausi* among the most numerous (Kennington & Rowlands 2006). Larger calanoids are also important components of the community, with the warmer water *C. helgolandicus*

more abundant than *C. finmarchicus*. Abundant jellyfish species in the area include *A. aurita, C. hysoscella, C. lamarckii* and *R. octopus* (Pikesley et al. 2014; DECC, 2016).

6.4.2 Benthos

The biota living near, on or in the seabed is collectively termed “benthos”. Water depth, temperature, salinity and type of local substrate all have an effect on the diversity and abundance of the benthos. The species composition and diversity of macrofauna found within sediments is commonly used as a biological indicator of sediment disturbance. A knowledge of the composition of the infauna (invertebrates that live within the sediments) and epifauna (those living on the sediment surface) is important in predicting the potential effects of the disturbance that might be caused by the proposed disposal of contaminated material.

As shown in Figure 6-11, offshore seabeds in the Irish Sea are predominantly sedimentary, many of glacial origin consisting mostly of sands and muddy sands (circalittoral sand, circalittoral muddy sand, circalittoral coarse and mixed sediment). In general, polychaete and cockle communities dominate much of the central intertidal area of Morecambe Bay and form the basis of an extensive fishery. Numerous recent surveys in connection with proposed and actual offshore wind farm developments, notably off the North Wales and Wirral coasts (e.g. COWL 2002, Seascape Energy 2002, NPower Renewables 2005, Dong 2013a & b), but also extending to the Solway Firth (E.ON 2013), have added further detail. Since some of these surveys extend out almost to the area of the Liverpool Bay oil and gas related surveys, the Liverpool Bay area is arguably now one of the most intensively surveyed sediment areas in UK waters. These surveys have broadly confirmed previous understanding of the habitats and communities, these being largely sands containing variants of the “shallow Venus” community, interspersed with sparser polychaete and amphipod communities, often with dense heart urchins *Echinocardium cordatum*, in more mobile sandy areas, and with richer pockets of gravelly or muddy sediments (DECC, 2016).

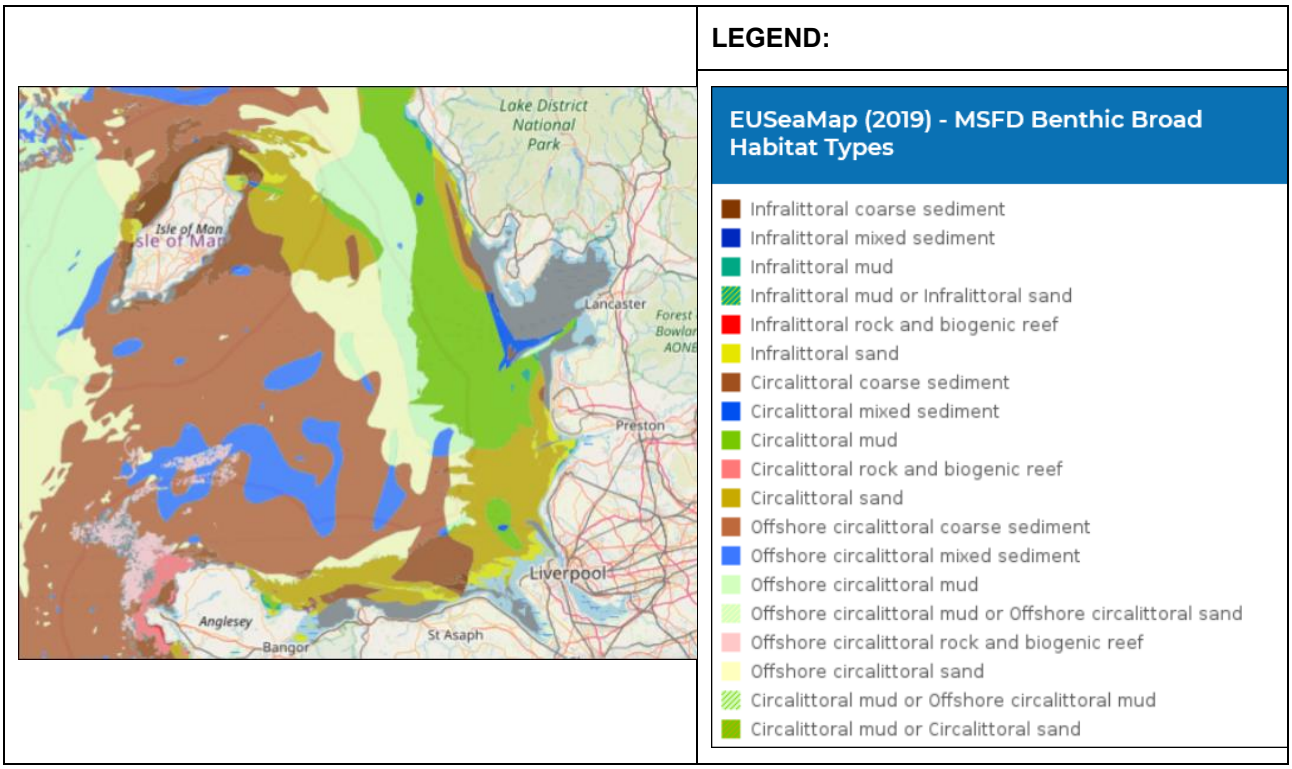

Figure 6-11: Benthic Broad Habitat Types in Liverpool Bay (EMODnet map, 2019)

During the subtidal baseline survey undertaken by RPS in October 2022, four notable taxa were recorded across all decommissioning stations (Table 6-6).

The ocean quog, *Arctica islandica,* is protected under the OSPAR list of threatened and/or declining species and habitats and one juvenile specimen was counted at GS38.

The polychaete *G Goniadella gracilis* is an invasive non-native species (INNS) that was first introduced in the UK, Liverpool Bay, in 1970 most likely by shipping from the east coast of North America. Only one specimen was recorded at station GS28.

No evidence of S. spinulosa reef features were noted across all decommissioning stations, as only three individuals were recorded. Two individuals were counted at partial decommissioning station GS31 and one at partial decommissioning station GS37.

The thumbnail crab hia. *scutellata* is a nationally scarce marine species and three individuals were found across all decommissioning stations: one individual each at stations GS26 and GS38 and one specimen at full decommissioning station GS57.

Table 6-6: Notable Taxa Recorded during EBS, October 2022

Taxon	Common Name	Designation	Total Abundance
Arctica islandica	Ocean quahog	OSPAR and Wales NERC S.42	1
Goniadella gracilis		Invasive & Non-Native	1
Sabellaria spinulosa	Ross Worm	OSPAR and Habitats Directive	3
Thia scutellata	Thumbnail Crab	Nationally scarce marine species	3

The dendrogram resulting from the cluster analysis (Appendix XV) and associated Type 1 SIMPROF (similarity profile routine) permutation test of all nodes within the dendrogram identified seven statistically significantly similar groups and two outlier stations that did not belong to any group ($p > 0.05$). To enable a broad interpretation of the community present, a similarity slice at 35 % was used to amalgamate the seven SIMPROF groups into four broader macrobenthic groups (Figure 6-12). The spatial distribution of these macrobenthic groups is presented in Figure 6-12.

SIMPER (similarity percentage analysis) was used to identify the key taxa contributing to the within group similarity of the macrobenthic group recognised; the full SIMPER results are provided in Appendix XVI.

Macrobenthic Group A – eight stations belonged to this group and were characterised by juveniles of Tellininae and *Nephtys*, *K. bidentata* and Nemertea all together contributing to about 54 % of the group average similarity of 49 %.

Macrobenthic Group B – eight stations belonged to this group and were characterised by Nematoda, the amphipod *Urothoe marina*, Nemertea, *K. bidentata*, and the polychaete *Paradoneis lyra* all together contributing to about 35 % of the group average similarity of 45.7 %.

Macrobenthic Group C – eight stations belonged to this group and were characterised by Nematoda, *K. bidentata*, Nemertea the polychaetes *Mediomastus fragilis* and *P. baltica* all together contributing to about 35 % of the group average similarity of 54.9 %.

Macrobenthic Group D – eight stations belonged to this group and were characterised by Nematoda, the oligochaete *Grania*, Nemertea and the basket shell *Varicorbula gibba* all together contributing to about 38 % of the group average similarity of 48.7 %.

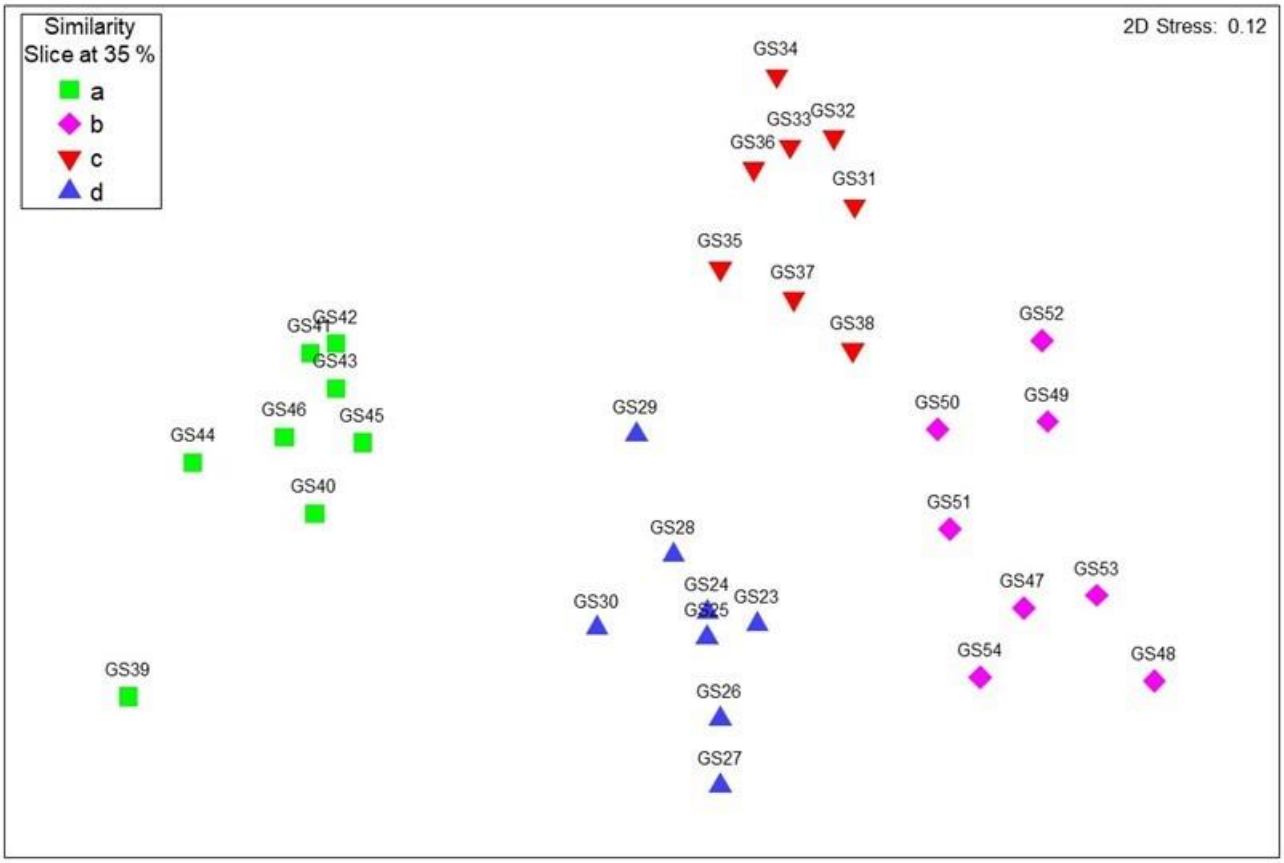

Figure 6-12: Two-dimensional nMDS Ordination of Macrobenthic Communities based on square root transformed and Bray-Curtis similarity abundance data

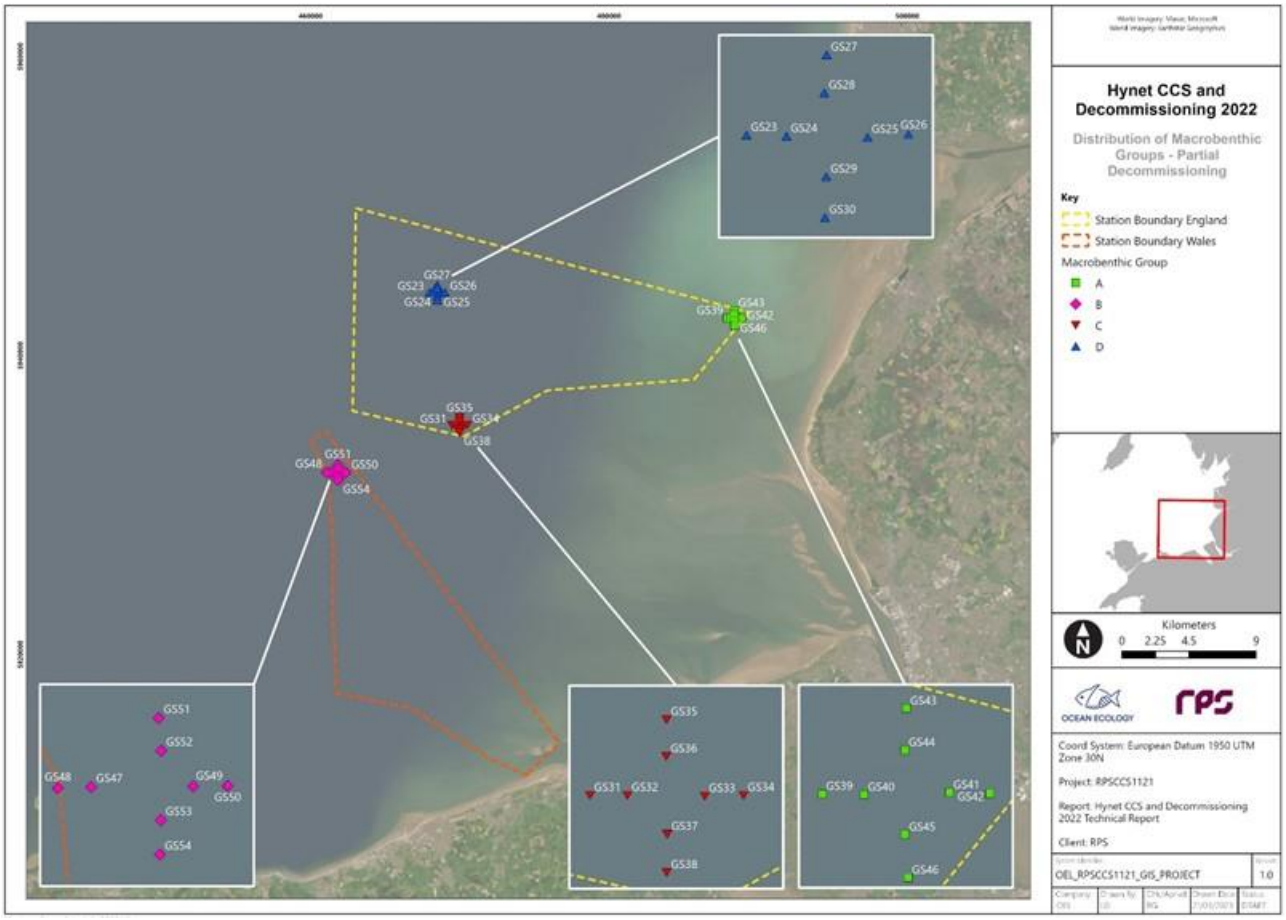

Figure 6-13: Spatial Distribution of Macrobenthic Groups

For each of the macrobenthic groups determined using cluster analysis, biotopes were assigned in consideration of industry standard practices and guidance (JNCC 2022(*); Parry 2015) based upon their faunal and physical characteristics.

Macrobenthic Group A was made up of eight stations all classified as broad scale habitats (BSH) A5.2 based on PSD data. These stations were all located close to the coast (6-12) and dominated by *K. bidentata*, Nemertea, Nematoda, *Megaluropus agilis* and *Bathyporeia guilliamsoniana*. None of the sand biotopes matched the above community and therefore these stations were assigned to European Nature Information System (EUNIS) classification A5.23 “Infralittoral fine sand”.

Macrobenthic Group B included eight stations all having at least 10 % gravel in their sediments. Four stations were classified as BSH A5.1 and the other four as A5.4 based on PSD data. Due to the heterogeneity in the substrate characterising this group a diverse community was observed that did not match any one biotope. Part of the community aligned with that described in biotope A5.142 “*Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel” with *L. cingulata, E. pusillus*, Nemertea, and *A. spinipes* being among the characterising taxa. However other taxa also dominated the community but remained unmatched as no coarse or mixed sediment biotope aligned with it. These included *U. marina*, *P. lyra, Lysilla nivea, Grania, Polycirrus* and *Leptocheirus hirsutimanus.* Therefore, stations belonging to BSH A5.1 were assigned to biotope A5.142, while stations belonging to BSH A5.4 were assigned to EUNIS classification A5.44. It should be noted that biotope A5.445 “*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittle star beds on sublittoral mixed sediment” was observed in the seabed imagery in proximity of the area covered by this group.

Macrobenthic Group C was made up of eight stations all having at least 10 % mud in their sediments except for station GS38 which had only 4 %. Five stations belonged to BSH A5.4 based on PSD data while the

remaining three stations were classified as A5.1, A5.2 and A5.3. As this group covered a range of substrates no one biotope matched the community observed at these stations. The community characterising this group included Nematoda, *K. bidentata*, Nemertea, *M. fragilis, P. baltica, P. lyra, Grania* and *T. pseudogaster*. Therefore, stations belonging to this group were assigned to EUNIS classifications A5.44, A5.14, A5.26 and A5.35 based on the corresponding BSHs determined by PSA.

Macrobenthic Group D included eight stations, seven of which were classified as BSH A5.2 based on PSD data and with station GS29 being classified as A5.3. None of the fine or muddy sand biotopes matched the community observed at these stations, which was characterised by Nematoda, *Grania*, Nemertea, *V. gibba, K. bidentata*, Chaetognatha, and *Polygordius.* All stations were therefore assigned to EUNIS classification A5.25 – Circalittoral fine sand, apart from station GS30 which was assigned to EUNIS classification A5.26 - Circalittoral muddy sand and station GS29 which was assigned to EUNIS classification A5.35.

6.4.3 Fish and Shellfish

Fish are separated into pelagic and demersal species, as follows:

- Pelagic species occur in shoals swimming in mid-levels of the water, typically making extensive seasonal movements or migrations between sea areas. Pelagic species include herring, mackerel, blue whiting and sprat;
- Demersal species live on or near the seabed and include haddock, cod, plaice, sandeel, sole and whiting.

The Irish Sea provides spawning and nursery grounds for a number of ecologically and commercially important demersal, pelagic, and shellfish species (Table 6-7 and Figure 6-14 through Figure 6-16). The fish population in the Liverpool Bay area are characterised by species typical of the Irish and neighbouring seas.

Rare or protected species present in the Liverpool Bay area include basking shark (*C. maximus*), common goby (*Pomatoschistus microps*), sand goby (*P. minutus*), allis shad (*A. alosa*) and Twaite shad (*A. fallax*). Also present in the area are salmon (*S. salar*), river lamprey (*L. fluviatilis*), sea lamprey (*P. marinus*) and smelt or sparling (*Osmerus eperlanus*) (Lockwood, 2005).

Table 6-7 Fish with Spawning and/or Nursery Grounds in East Irish Sea

Common Name	Latin Name	Spawning/ Nursery Ground
Anglerfish	*Lophius piscatorius*	Nursery
Cod	*Gadus morhua*	Spawning and nursery
Herring	*Clupea harengus*	Nursery
Lemon Sole	*Microstomus kitt*	Spawning and nursery
Ling	*Molva molva*	Nursery
Mackerel	*Scomber scombrus*	Spawning and nursery
Norway Lobster	*Nephrops norvegicus*	Spawning and nursery
Plaice	*P. platessa*	Spawning and nursery
Sandeels	*Ammodytes marinus*	Spawning and nursery
Sole	*S. solea*	Spawning and nursery
Spotted Ray	*Raja montagui*	Nursery
Sprat	*Sprattus sprattus*	Spawning and nursery

Common Name	Latin Name	Spawning/ Nursery Ground
Spurdog	*Squalus acanthias*	Nursery
Thornback Ray	*Raja clavata*	Nursery
Tope Shark	*Galeorhinus galeus*	Nursery
Whiting	*Merlangius merlangus*	Spawning and nursery

Most surveys related to fishery grounds are conducted on an annual basis; however, some study areas (including the Irish Sea) have benefited from biannual surveys (e.g. spring and autumn). It is recognised that some fish species may exhibit pronounced seasonal patterns in either distribution or abundance (Table 6-8). Other species may have more restricted seasonal changes in distribution (e.g. moving into deeper water during the winter) and so do not encompass seasonality in fish distributions. [Ref 55]

Table 6-8: Seasonality in Fish Distribution for the Block 110/13

Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Anglerfish	N	N	N	N	N	N	N	N	N	N	N	N
Cod	SN	SN	SN	SN	N	N	N	N	N	N	N	N
Herring	N	N	N	N	N	N	N	N	N	N	N	N
Lemon sole	N	N	N	SN	SN	SN	SN	SN	N	N	N	N
Ling	N	N	N	N	N	N	N	N	N	N	N	N
Mackerel	N	N	SN	SN	SN	SN	SN	N	N	N	N	N
Norway Lobster	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN
Plaice	SN	SN	SN	N	N	N	N	N	N	N	N	SN
Sandeels	SN	SN	N	N	N	N	N	N	N	N	SN	SN
Sole	N	N	SN	SN	SN	N	N	N	N	N	N	N
Spotted Ray	N	N	N	N	N	N	N	N	N	N	N	N
Sprat					S	S	S	S				
Spurdog	N	N	N	N	N	N	N	N	N	N	N	N
Thornback Ray	N	N	N	N	N	N	N	N	N	N	N	N
Tope Shark	N	N	N	N	N	N	N	N	N	N	N	N
Whiting	N	SN	SN	SN	SN	SN	N	N	N	N	N	N

Key: S= Spawning; N=Nursery; SN=Sensitivity Not Documented; Blank=No Data

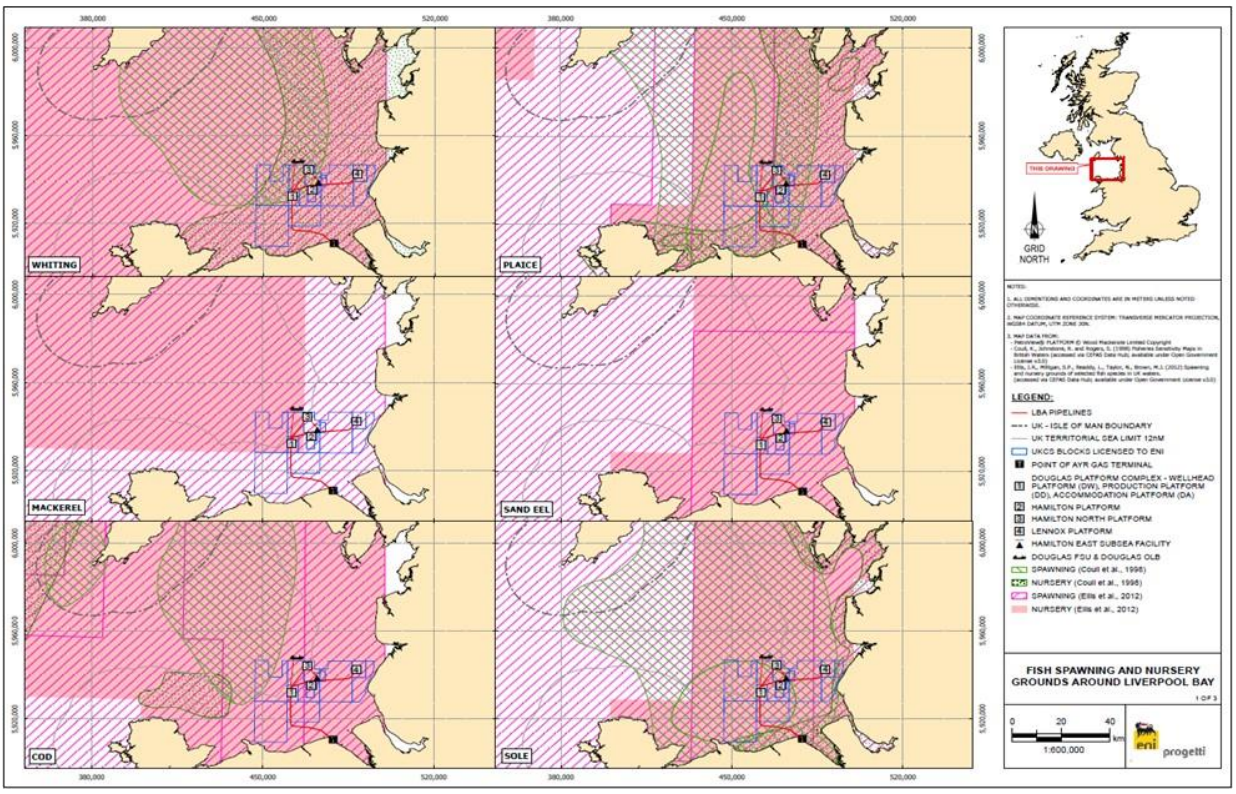

Figure 6-14: Fish Spawning and Nursery Grounds around Liverpool Bay (1 of 3)

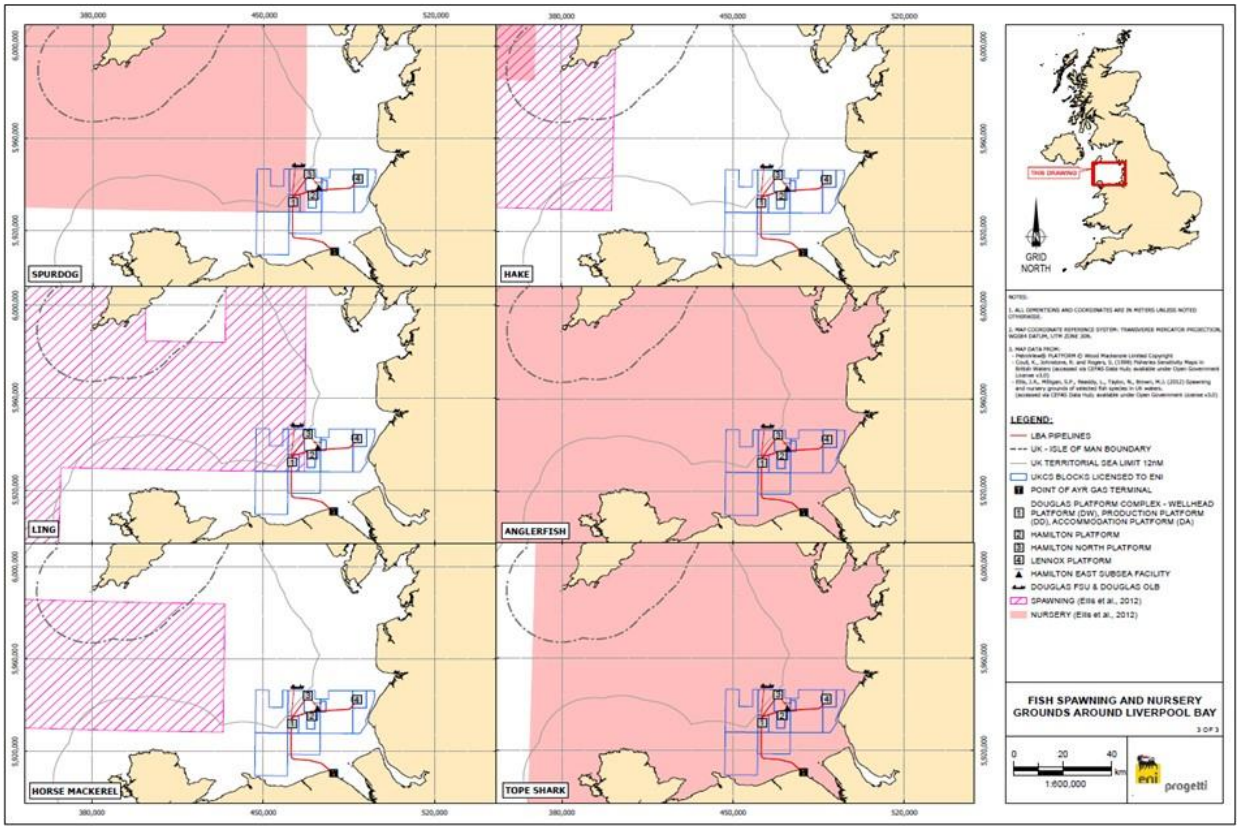

Figure 6-15: Fish Spawning and Nursery Grounds around Liverpool Bay (2 of 3)

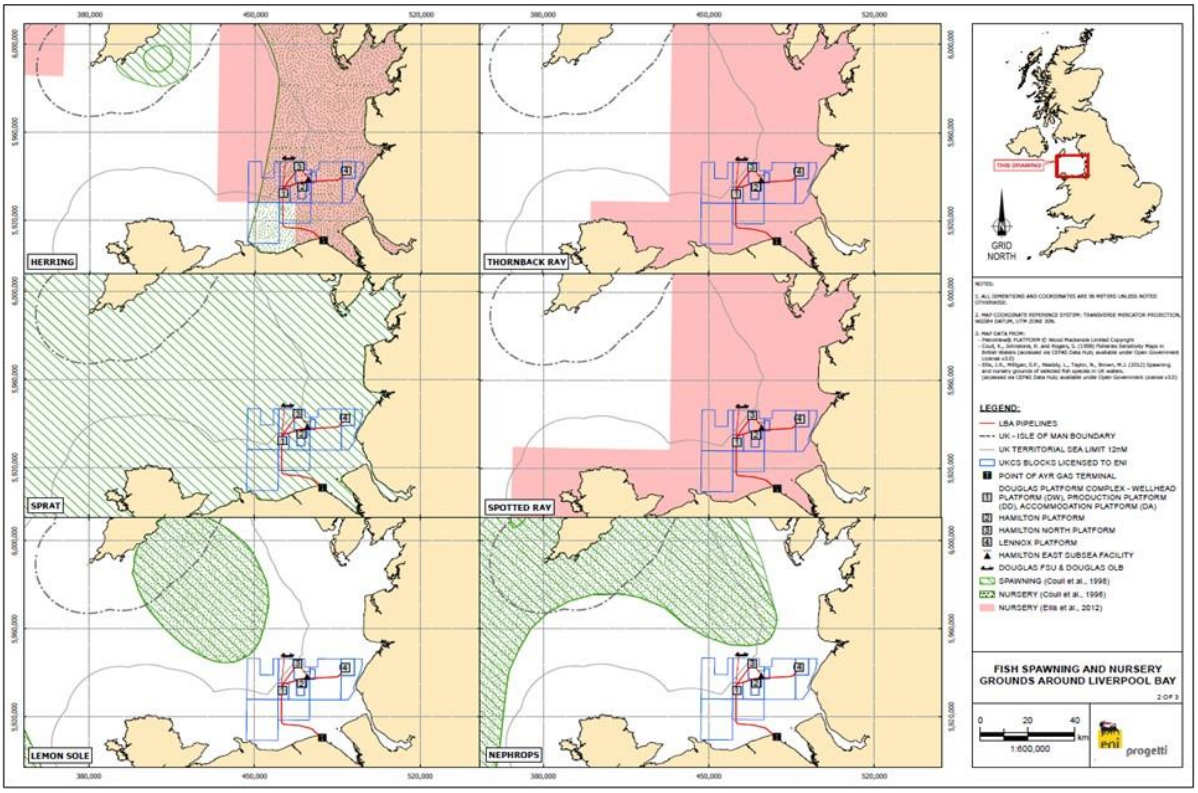

Figure 6-16: Fish Spawning and Nursery Grounds around Liverpool Bay (3 of 3)

6.4.4 Marine Mammals

Five species are commonly encountered in the Irish Sea: harbour porpoise, bottlenose dolphin, short-beaked common dolphin, Risso's dolphin and minke whale. Grey and harbour seals are also regularly present in certain areas (DECC, 2016). However, within the Eastern Irish Sea, harbour porpoise (*P. phocoena*) bottlenose dolphin (*Tursiops truncatus*), and common dolphin (*Delphinus delphis*) are the three most frequently recorded cetaceans (Reid *et al*., 2003).

The harbour porpoise is recognised as an Annex II species and is the most frequently recorded cetacean in the Eastern Irish Sea. They are present throughout the year with most sightings occurring in the summer months of July to September. Harbour porpoise are widely distributed across the whole Eastern Irish Sea but relatively higher numbers have been recorded north of Blackpool (Reid *et al.*, 2003).

Bottlenose dolphins are classified as an Annex II species. Bottlenose dolphins occur widely in Cardigan Bay where they are a qualifying species for the Cardigan Bay SAC and Pen Llŷn a'r Sarnau SAC. Observations in Liverpool Bay indicate that there is no evidence of any change in the status or distribution of bottlenose dolphin from data collected between 2001 and 2005 and data from before 2001 (Evans & Anderwald, 2007).
They are most frequently recorded in the summer months of July to September.

In British and Irish coastal waters, common dolphin (Annex IV species) distribution has a mainly western and southern component. They are common off the west coast of Ireland, in the western approaches to the Channel and the southern Irish Sea (Evans & Anderwald, 2007). In the northern Irish Sea, common dolphins have been recorded over a wide area with no particular locality apparently favoured. The nearest sightings to Liverpool Bay are along the north Welsh coast in low to moderate densities. Most sightings in the northern Irish Sea occur between July and September, with group sizes numbering usually between one and twenty animals, occasionally up to fifty individuals.

Estimates of cetacean abundance in the Celtic and Irish Seas are provided in Table 6-9.

Table 6-9: Estimates of Cetacean Abundance in the Celtic and Irish Seas

Species	Management Unit (MU)	Abundance in MU	Confidence Interval	Abundance in UK part of MU	Confidence Interval
Harbour porpoise	Celtic and Irish Seas	104,695	56,774 - 193,065	47,229	25,611 - 87,094
Bottlenose dolphin	Irish Sea	397	362 - 414	397	362 - 414
Common dolphin	Celtic and Greater North Seas	56,556	33,014 - 96,920	13,607	8,720 - 21,234
Minke whale		23,528	13,989 - 39,572	12,295	7,176 - 21,066
White-beaked dolphin		15,895	9,107 - 27,743	11,694	6,578 - 20,790
White-sided dolphin		69,293	34,339 - 139,828	46,249	26,993 - 79,243

Harbour (common) seal (*Phoca vitulina*), an Annex II species, are scarce in the East Irish Sea and grey seal *(Haliocherus grypus*), also and Annex II species are infrequent. There are an estimated 5,000 to 7,000 grey seals in the Irish Sea although most of these occur off Southwest Wales and eastern Ireland (Keily *et al*. 2000) (Table 6-10). There are no major grey seal breeding sites in the Eastern Irish Sea area. However, grey seal haul-out sites occur at the mouth of the Dee at West Hoyle Bank, South Walney Island on the north side of Morecambe Bay, and sites around Anglesey and the Isle of Man. Grey seal numbers in the northern Irish Sea are reported to increase during the summer months (Duck, 1996).

Table 6-10: Estimates of Pinniped Abundance in the Relevant Marine Unit (MU)

Species	Management Unit	Seal Count	Estimated Population Size(1)	Survey Year
Grey Seal	South and West England and Wales	1,800	6,000	1994 - 2003, 2007
Harbour Seal		20	-	1994 - 2003

(1) An independent population estimate for grey seals was calculated using counts obtained during the 2007 and 2008 summer surveys. This estimate was not available for harbour seals. Count converted using mean factor of 3.3253 derived from Lonergan et al. (2011), rounded to nearest 50

6.4.5 Seabirds

All 25 seabird species known to breed in the UK, breed in the Irish Sea area; however, the majority of those breeding are made up of just five species: Manx shearwater (*Puffinus puffinus*); gannet (*Morus bassanus*); lesser black-backed gull (*L. fuscus*); guillemot (*Uria aalge*) and herring gull (*L. argentatus*). The Liverpool Bay area supports one of two large gannetries located in the wider west coast region. (DECC, 2016).

Several SPAs in the Liverpool Bay area contain breeding seabird colonies of international importance, including the Dee Estuary, Ribble and Alt Estuary, and Morecambe Bay. The Project area lies within Liverpool Bay SPA, which is partially designated for the protection of seabirds, including little gull (*H. minutus*) in the

non-breeding season; and foraging areas for common tern (*S. hirundo*) and little tern (*S. albifrons*) in the breeding season.

Throughout the year the distribution and abundance of seabird species varies, and areas of the Irish Sea vary in importance. Auks such as guillemots and Manx shearwater are concentrated in their breeding colonies from May to August, making short foraging trips, typically within 30 km of their colonies. The majority of the UK auk breeding population aggregates in the Irish Sea Front area (located approximately 100 km north-west of the Project area) in August and September, before departing for wintering grounds. Guillemots and razorbills also utilise the Irish Sea Front area.

The highest density of guillemots is observed within coastal waters during the breeding and post breeding season (May-August), whilst razorbills are less widespread. Gannets are present all year round, however highest numbers occur in mid to late summer, typically concentrating around colonies during the breeding season. Herring gulls are also present year-round with aggregations offshore and in coastal waters of the central Irish Sea. Kittiwakes have a wide distribution.

The European Seabirds at Sea (ESAS) database is the most complete and longstanding dataset detailing the distribution of seabirds at sea, compiling a range of boat and transect data over a period of 29 years. The data indicates that project area lies within a hotspot area, defined as an important area of high seabird density at sea, for great cormorant during winter. The data predicts a density of < 3 seabirds per km^2 during the breeding season (March – September) and < 9 seabirds per km^2 in winter (November – March).

The most abundant species present in the vicinity to the project area are kittiwake during the breeding season, fulmar, great cormorant, guillemot, common gull, lesser black-backed gull, herring gull and guillemot over-winter, and guillemot during the post breeding dispersal period. The predicted density of great cormorant is relatively low compared to its density range across UK waters, suggesting that the species is more likely to utilise other parts of the hotspot area.

Of the species found in the LBA area, the global and European populations of kittiwake (*R. tridactyla*) are listed as Vulnerable on the International Union for the Conservation of Nature (IUCN) Red List, and the global and European populations of razorbill (*Alca torda*) are listed as Near Threatened. Fulmar (*Fulmarus glacialis*) is listed as Least Concern (population decreasing) globally although Endangered in Europe. Globally, little gull, herring gull, and guillemot are of Least Concern (population decreasing); however, their European populations are Near Threatened. Atlantic puffin (*Fratercula arctica*) is listed as Vulnerable globally and Endangered in Europe.

The global and European populations of Manx shearwater, gannet, great cormorant, Arctic skua, great skua, black-headed gull, great black-backed gull, common gull, lesser black-backed gull, sandwich tern and common tern are of Least Concern (population decreasing).

The numbers of breeding waterbirds in this region is relatively low compared to other parts of the UK, though the Dyfi Estuary is one of the most important areas in Wales for breeding waders, particularly breeding redshank, teal, red-breasted merganser and shelduck and breeding eider, oystercatcher and lapwing are found on the Isle of Man.

Large numbers of ringed plover breed in Morecambe Bay, the Solway Firth and Luce Bay, with these areas holding the main breeding concentrations of this species on the west coast of Britain. The area also includes Milford Haven which support breeding shelduck. The Inner Solway, the Ribble, Morecambe Bay and Duddon Estuary have large breeding populations of shelduck, redshank, oystercatcher, dunlin (the most southerly regularly saltmarsh breeding dunlin in Britain) and curlew.

The dry grassland breeding population of shelduck in the Ribble Estuary is the most numerous in Britain. Breeding eider are also found in Morecambe Bay (the most southerly breeding population in Britain) and around Walney Island.

Seabirds are not normally adversely affected by routine offshore oil and gas operations however in the unlikely event of an oil spill; birds are vulnerable to oiling from surface pollution. This can cause direct toxicity through

ingestion, and hypothermia as a result of the bird's inability to waterproof their feathers (JNCC, 2016). Their sensitivity to oiling varies considerably through the year and is dependent on variety of factors, including time spent on the water, total biogeographical population, reliance on the marine environment and potential rate of population recovery.

Some pre-decommissioning related Plug and Abandonment works are being carried out in the LBA area and potential impact of those operations on seabirds (amongst other recipients) are assessed and described in the following permits:

- WIA/1587 MAT for 110/15-6z (Lennox field)
- WIA/1635 MAT for 110/13-6 (Douglas field)
- WIA/1629 MAT for 110/15-5 (Hamilton North field)

JNCC (JNCC, 2016) has conducted a series of seabird surveys to assess the distribution and abundance of both onshore and offshore seabird populations. From these surveys the 'Seabird Oil Sensitivity Index' (SOSI) identifies areas at sea where seabirds are likely to be most sensitive to oil pollution. It is based on seabird survey data collected from 1995 to 2015, from a wide survey area extending beyond the UK Continental Shelf using boat-based, visual aerial and digital video aerial survey techniques (JNCC, 2016).

Table 6-11 below presents seabird sensitivity in UKCS block 110/13 and adjacent blocks (JNCC, 2016).
The updated 2016 SOSI report concludes that the analysis of new data, and revision of methods, has succeeded in providing a new assessment of the sensitivity of seabird concentrations to oil pollution. It concludes that the 'Certain et al. (Certain, 2015) Method' appropriately represents the relationship between seabird sensitivity and abundance, and that that it should be used in future analyses. (JNCC, 2016)

The combined seabird data and species sensitivity index values are subsequently summed at each location to create a single measure of seabird sensitivity to oil pollution. This is presented as a series of fine scale density maps for each month that show the median, minimum and maximum seabird sensitivity to oil pollution, and an indication of data confidence. The index is independent of where oil pollution is most likely to occur; rather, it indicates where the highest seabird sensitivities might lie if there were to be a pollution incident. (JNCC, 2016).

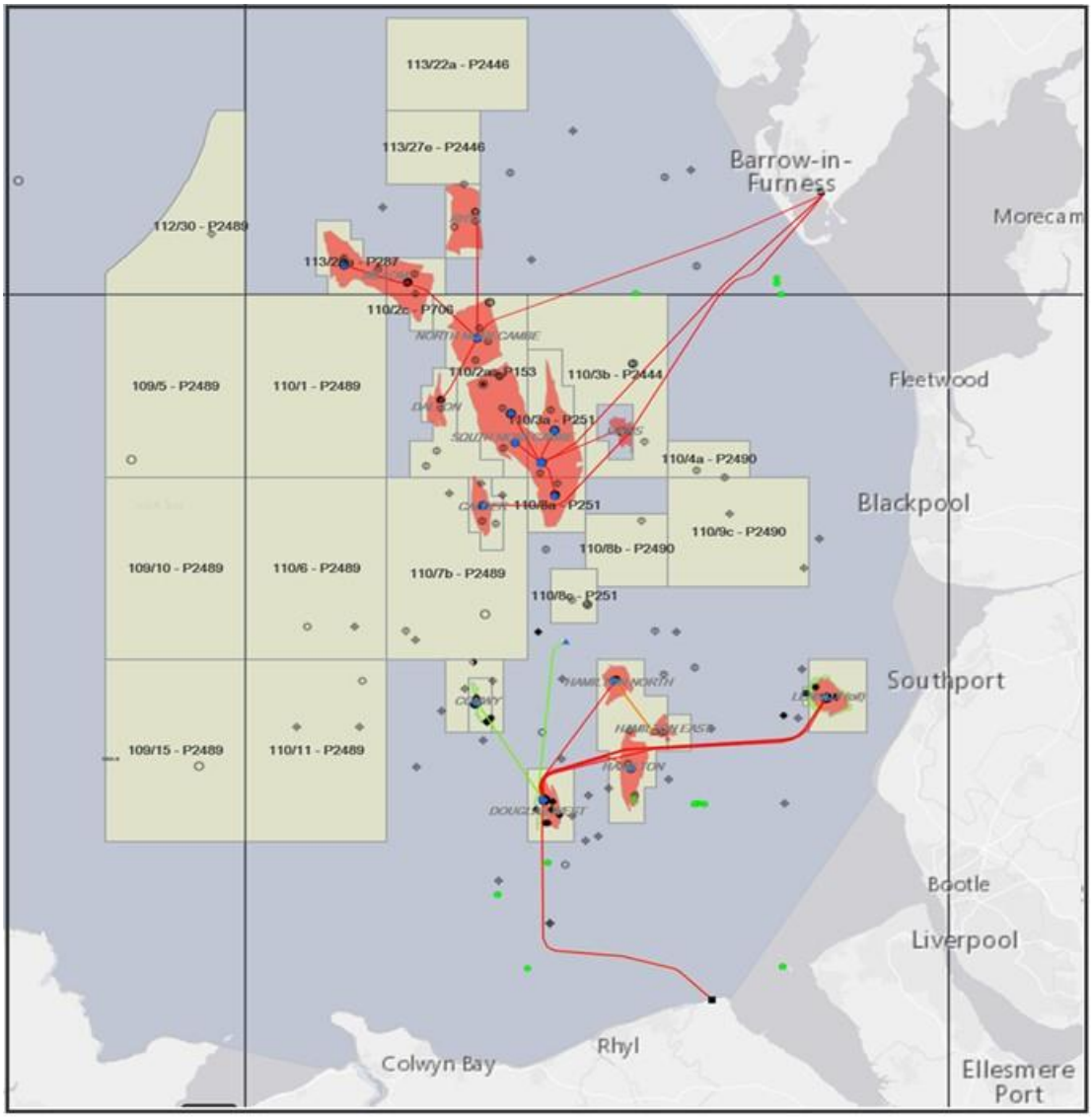

Figure 6-17: UKCS Blocks in the Irish Sea

The SOSI score for each UKCS Block can be ranked into sensitivity categories, from 1 (extremely high sensitivity) to 5 (low sensitivity) (Table 6-11). An assessment of the median SOSI scores for the blocks with Eni Liverpool Bay Assets (i.e. 110/08 – OSB, 110/13 – Douglas, Hamilton, Hamilton North, Hamilton East, 110/14 – pipelines from Douglas to Lennox, 110/15 – Lennox, 110/18 & 110/19 – 20" pipeline from Douglas to PoA) and surrounding blocks indicates that sensitivity is generally high to extremely high from October to April, low to medium from May to July, and low to extremely high from August to September.

Whilst birds can be considered sensitive to pollution for a significant proportion of the year, the risk of an oil spill from the decommissioning works is considered remote and therefore the overall risk to birds is considered minimal.

Table 6-11: Assessment of Seabird Oil Sensitivity Index (SOSI) Scores in UKCS Blocks around Liverpool Bay Assets

Block	J	F	M	A	M	J	J	A	S	O	N	D
110/2	4	3	3	4	4	5	4	3	4	2	3	3
110/3	2	2	2	4	3	5	4	3	4	2	2	2
110/4	1	1	1	4	3	4	4	3	4	2	1	2
110/7	2	3	2	3	5	5	5	4	3	2	3	2
110/8	**1**	**2**	**2**	**3**	**4**	**4**	**5**	**4**	**4**	**2**	**2**	**2**
110/9	1	1	1	3	4	4	5	3	4	3	1	1
110/10	1	1	1	3	4	5	5	3	4	2	1	1
110/12	1	1	1	1	5	4	5	4	4	3	1	2
110/13	**1**	**1**	**1**	**1**	**5**	**4**	**5**	**4**	**2**	**2**	**1**	**2**
110/14	**1**	**1**	**1**	**2**	**4**	**4**	**5**	**3**	**4**	**2**	**1**	**1**
110/15	**1**	**1**	**1**	**3**	**4**	**5**	**5**	**3**	**3**	**1**	**1**	**1**
110/17	1	1	1	1	5	3	5	4	5	3	1	2
110/18	**1**	**1**	**1**	**1**	**5**	**4**	**5**	**4**	**1**	**1**	**1**	**2**
110/19	**1**	**1**	**1**	**1**	**5**	**5**	**5**	**4**	**1**	**1**	**1**	**1**
110/20	1	1	1	1	5	5	5	3	1	1	2	1
110/22	1	1	1	1	5	3	5	4	4	1	1	2
110/23	1	1	1	1	5	4	5	4	1	1	1	2
110/24	1	1	1	1	5	5	5	4	1	1	1	1
J/6	1	1	1	3	4	5	5	2	2	1	1	1

Key: 1 = Extremely High; 2 = Very High; 3 = High; 4 = Medium; 5 = Low; N = No Data.
Blocks with Liverpool Bay Assets are in bold.

6.5 Socio-Economic Sensitivities

6.5.1 Commercial Fishing

The Irish Sea is an important fishing ground exploited by vessels of many countries. Eni UK Limited assets are located in ICES rectangle 36E6, which is targeted mainly for demersal and shellfish species, with a smaller fishery for pelagic species (Table 6-12; MMO, 2020).

Table 6-12: Liveweight and Value of Species in 2021 for ICES rectangle 36E6 (MMO, 2022)

Species type	2021 Data		
	Liveweight (tonnes)	Landed Weight (tonnes)	Value (£)
Demersal	42.96	39.53	168,107.43
Shellfish	1,532.88	1,529.48	1,550,373.90
Pelagic	0.00	0.01	25.86
Total	**1,575.84**	**1,569.02**	**1,718,507.19**

Queen scallops (*Aequipecten opercularis*) are the main species fished in the area in 2021 accounting for 33% value and 55.8% of the weight of landings in the area. Whelks (*Buccinum undatum*) are the next most important species accounting for 30% of the value in rectangle 36E6 and 27% of the landed weight. Scallops (*Pecten maximus*) also accounted for a relatively large percentage of the value (22.3%) and weight (13.4%). (MMO, 2022).

Demersal trawl, pots and traps, and drift and fixed nets were the most utilised gear type in Liverpool Bay, according to the available data 35.1% of effort used trawls, 28.6% drift and fixed nets and 21.1% pots and traps. (MMO, 2022)

6.5.2 Shipping

Liverpool is one of the major ports in the UK, handling 31 million tonnes of cargo annually (DECC, 2016). The Port of Liverpool saw a 7% growth during 2016, and in November 2016 a new container port was opened to increase capacity (Maritime and Shipping Statistics, 2017). Shipping activity in Liverpool Bay is therefore relatively intense, with some portion of this traffic also associated with the oil and gas fields of the Eastern Irish Sea, as supply boats operate out of ports including Liverpool, Barrow and Heysham (DECC, 2016).

Shipping densities in the study area vary from low to moderate to high. For the majority of the study area shipping density is classed as moderate (1,000 – 5,000 vessels per year) (DECC, 2005) or up to 500 vessels per week (MMO, 2014). The most active vessels in the area are cargo, tanker, passenger vessels and port and non-port service craft (MMO, 2014). The busiest domestic crossings include connections between Liverpool-Douglas, Cairnryan-Larne and Cairnryan/Stranraer-Belfast ports, carrying approximately 3 million passengers in 2014 (DECC, 2016).

Within the whole Xodus (2020) study area including 10 nm around all Liverpool Bay Assets, the Automatic Identification System (AIS) vessel tracks data was filtered to routine traffic only. Routine traffic typically includes cargo vessels, tankers and other vessels but excludes fishing vessels, military operations, tugs, dredgers, pleasure craft and sailing vessels. The whole LBA study area contains a total of 15,479 routine vessel tracks associated with 1,394 different vessels, which corresponds to an estimated 42.4 vessel transits per day (Xodus, 2020).

In total 27 shipping lanes were identified across the whole LBA area. Amongst shipping lane traffic, cargo vessel tracks dominated, and account for between 74% (HN) and 71% (OSB) of all shipping lane tracks within the five 10 nm study areas. Tanker vessel tracks in the study areas were consistently much lower than cargo, at between 20% (Douglas Complex) and 16% (OSB) of shipping lane traffic (Xodus, 2020) (Figure 6-18).

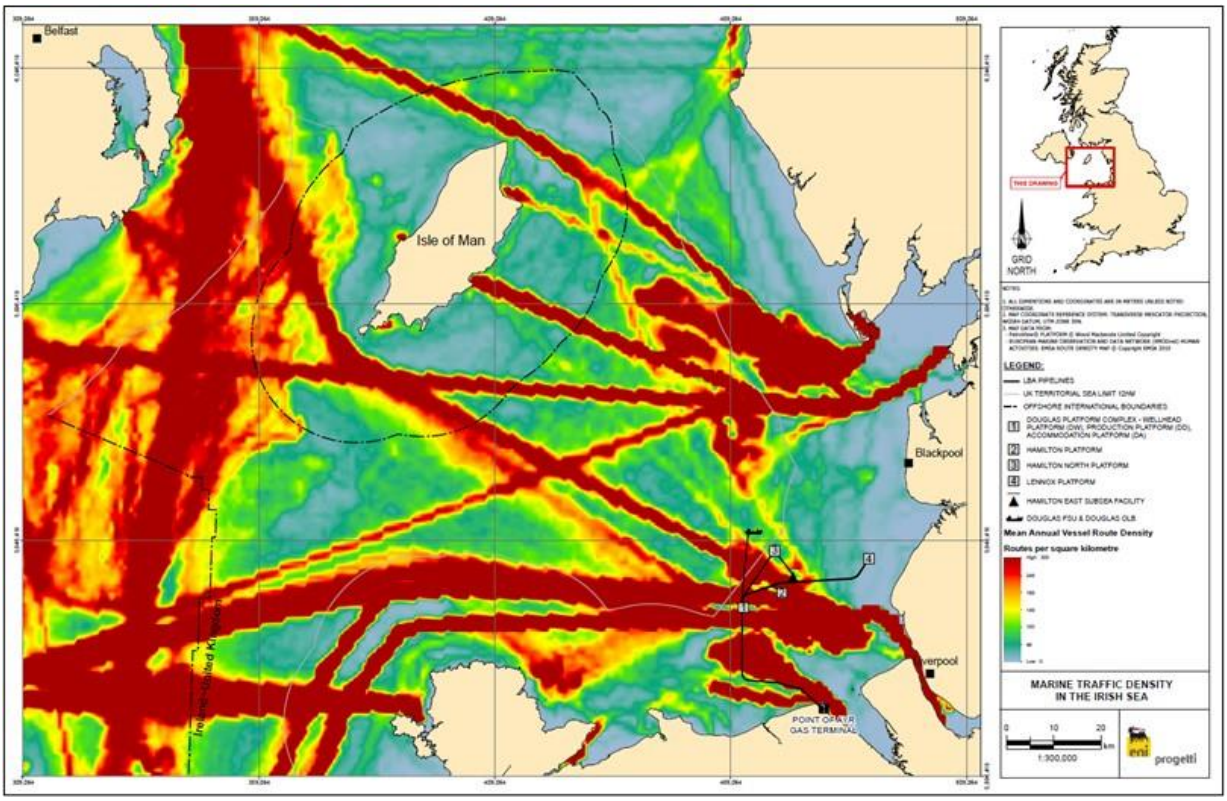

Figure 6-18: Shipping in the LBA Area

6.5.3 Oil and Gas Activities

The level of oil and gas activity in the area is high as shown in Figure 6-19. The Morecambe South DP-3 platform is located approximately 31,7 km to the north of Lennox platform.

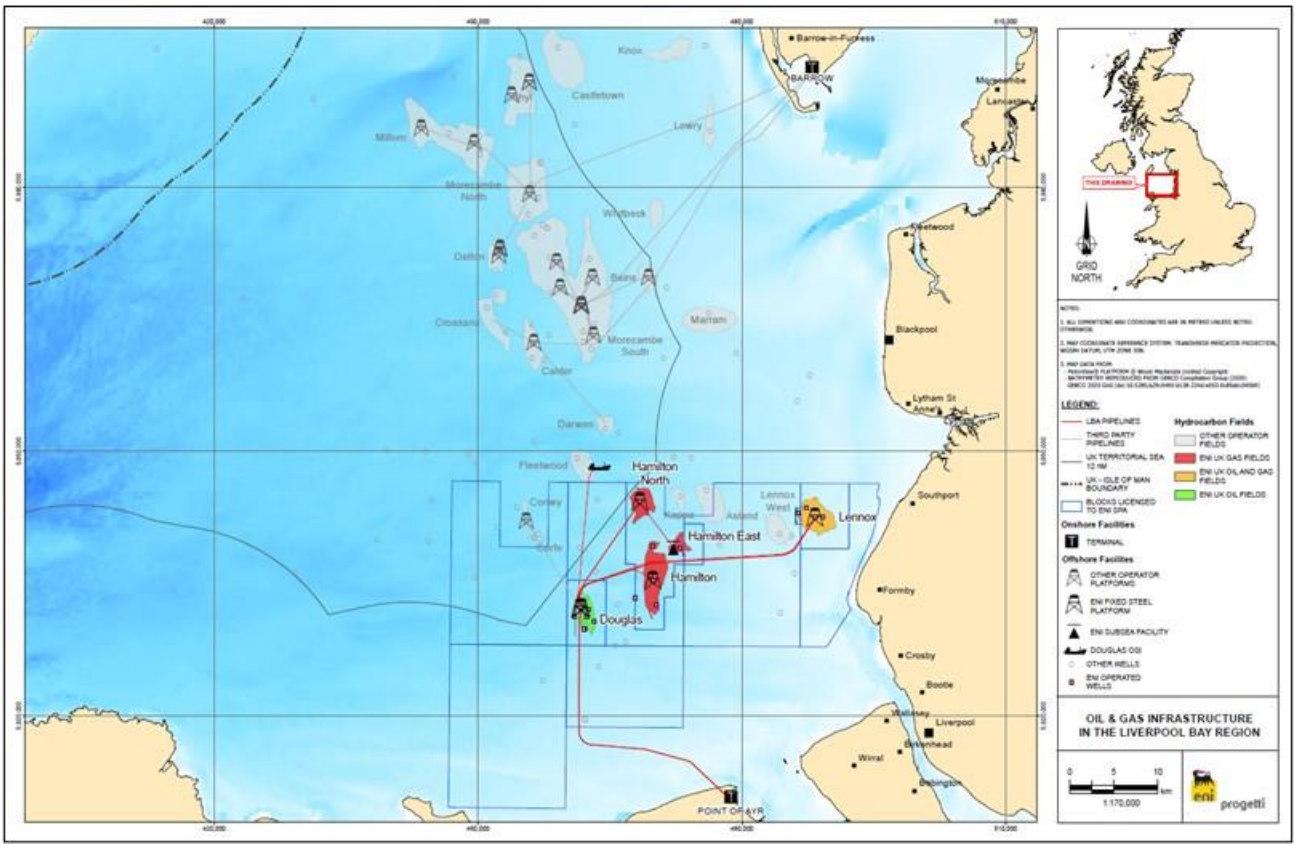

Figure 6-19: Oil and Gas Facilities in the LBA Project Area

6.5.4 Other Infrastructure (ie. Cables and Offshore Wind farms)

Two active telecommunications cables pass through the north-eastern corner of the LBA project area: the active 'ESAT 2' telecom cable and the active 'Hibernia Atlantic' telecom cable (Figure 6-20).

There are four power cables which intersect the infrastructure and other sea users local study area;

- Western HVDC link, operated by National Grid and Scottish Power
- Gwynt y Môr offshore wind farm export cable, operated by Innogy
- North Hoyle offshore wind farm export cable, operated by RWE npower renewables
- Burbo Bank Extension offshore wind farm export cable, operated by Ørsted.

There are number of proposed and operational offshore wind farms in the east Irish Sea, the closest of which are shown in Figure 6-20. There is spatial overlap between a number of proposed or operational wind farms and the infrastructure and other sea users local study area as shown in Table 6-12(a). Four bidding areas for leasing under TCE Offshore Wind Leasing Round 4 were released in September 2019, three of which are located in the Irish Sea; The Morgan Offshore Wind Project (being developed by bp/EnBW), the Mona Offshore Wind Project (being developed by bp/EnBW) and the Morecambe Offshore Windfarm (being developed by Offshore Wind Ltd, a joint venture between Cobra Instalaciones y Servicios, S.A. and Flotation Energy).

Within Isle of Man territorial waters, Ørsted has signed an Agreement for Lease allowing them to investigate an area for a proposed offshore wind farm.

Table 6-12 (a) Offshore Wind Farms in The East Irish Sea

Name	Capacity (MW)	Operator	Distance to other sea users local study area (km)
Operational			
Gwynt y Môr	576	Innogy	0.00
Burbo Bank Extension	259	Ørsted	0.50
North Hoyle	60	RWE npower renewables	3.90
Rhyl Flats	90	RWE Renewables	8.50
Burbo Bank	90	Ørsted	10.20
West of Duddon Sands	389	Ørsted	29.00
Barrow	90		34.00
Walney Extension (3 and 4)	659	Ørsted	35.40
Walney 1	184	Walney (UK) Offshore Windfarms Ltd.	37.20
Walney 2	184	Walney (UK) Offshore Windfarms Ltd.	39.80
Ormonde	150	Ormonde Energy Ltd.	44.70
Round 4 projects			
Mona Offshore Wind Project	1,500	bp/EnBW	5.50
Morecambe Offshore Windfarm	480	Offshore Wind Ltd.	7.60
Morgan Offshore Wind Project	1,500	bp/EnBW	34.10
Proposed			
Awel y Môr	1,100	Innogy	0.00
Isle of Man Wind Farm	TBC	Ørsted	56.90

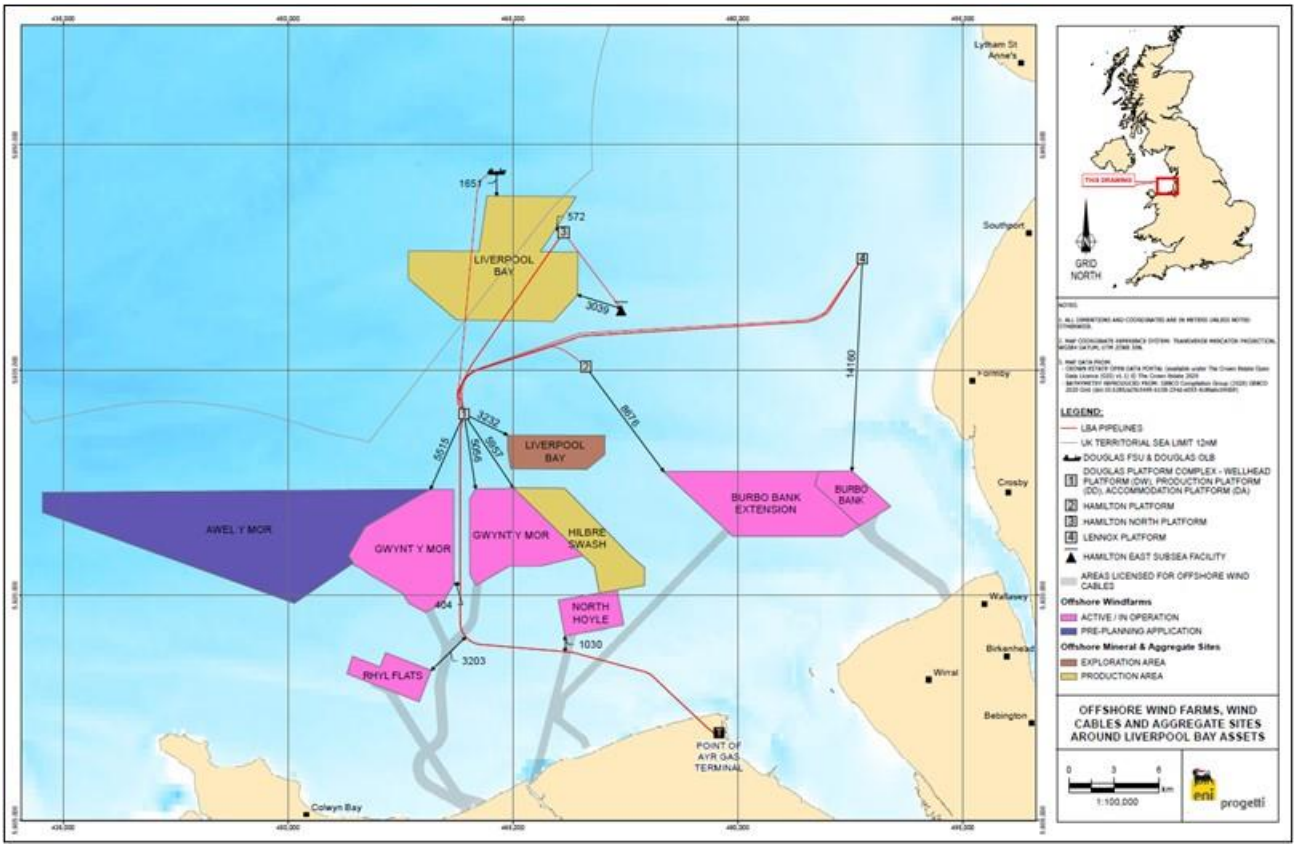

Figure 6-20: Offshore Wind farms, Cables and Aggregates in the LBA Project Area

6.5.5 Offshore Aggregate and Dredging Areas

A number of aggregate areas and disposal sites are also present (see Figure 6-20), namely the Liverpool Bay Aggregate Exploration and Production sites and Hilbre Swash production site. In addition, navigational dredging takes place approximately 6 km to the southeast of the LBA project area at the Mersey Approach Channel.

Table 6-13 presents the distances from the LBA to other sea users.

Table 6-13: Distances from LBA to Other Sea Users

LBA Facilities	Distance to other O&G installations (m)	Distance to Windfarms (m)	Distance to Offshore Mineral and Aggregate Sites (m)
Hamilton platform	16942 m to Conwy Platform	8676 m to Burbo Bank Extension	3704 m to Liverpool Bay Production site
Hamilton North platform	13098 m to Conwy Platform	17276 m to Burbo Bank Extension	572 m to Liverpool Bay Production site
Lennox Platform	31716 m to Morecambe South DP-3 Platform	14600 m to Burbo Bank	19009 m to Liverpool Bay Production site

6.5.6 Military Activity

The military have extensive interest in the northern Irish Sea, with submarine, surface vessel and aircraft exercising in the region. There are four RAF bases in the region however there is no Royal Navy or RAF practice area in Liverpool Bay. Blocks 110/13 and 110/15 comprise Ministry of Defence (MoD) training grounds

such that they must be notified 12 months in advance if new installations are to be located in the area (DECC, 2014).

Joint Warrior exercises are planned and conducted by the MoD JTEPS and generally take place every spring and autumn. They provide a joint, multi-threat environment in which UK, NATO and Allied units and their staffs may undertake collective training and pre-deployment training in tactical formation for employment in a Combined Joint Task Force (JNCC, 2016).

6.5.7 Marine Archaeology

There are many wrecks present in the Liverpool Bay area due to the history of high density shipping and the shallow water depth. Within the area bounded by latitude 53° 30'N - 53° 40'N and longitude 03° 00'W - 03° 36'W, 74 charted wrecks, 11 anchors and 232 obstructions have been identified (Figure 6-21). Two wrecks are recognised as being particularly important (Gale and Fenwick, 1996). The *Mary* lies off the Skerries, Anglesey and is designated as an historic wreck by the Department of National Heritage. The *Resurgam* was the world's first practical working submarine and is located off the North Wales coast.

Other features included in the National Monument Register for Wales (NMRW) and located within the offshore Project Zone of Influence include the following:

- Unnamed post-medieval wreck north of Douglas complex, approximately 85 m east from the 20" gas export pipeline from Hamilton to Douglas
- Spoil ground south of Douglas oil field, approximately 183 m west from the 20" gas export pipeline from Douglas to Point of Ayr
- Modern wreck of the pleasure yacht "My Mink" approximately 2 km off Flintshire coast and 124 m southwest from the 20" gas export pipeline from Douglas to Point of Ayr
- Post-medieval wreck of a wooden sloop or smack "Wave" approximately 450 m off Flintshire coast and 160 m southwest from the 20" gas export pipeline from Douglas to Point of Ayr.

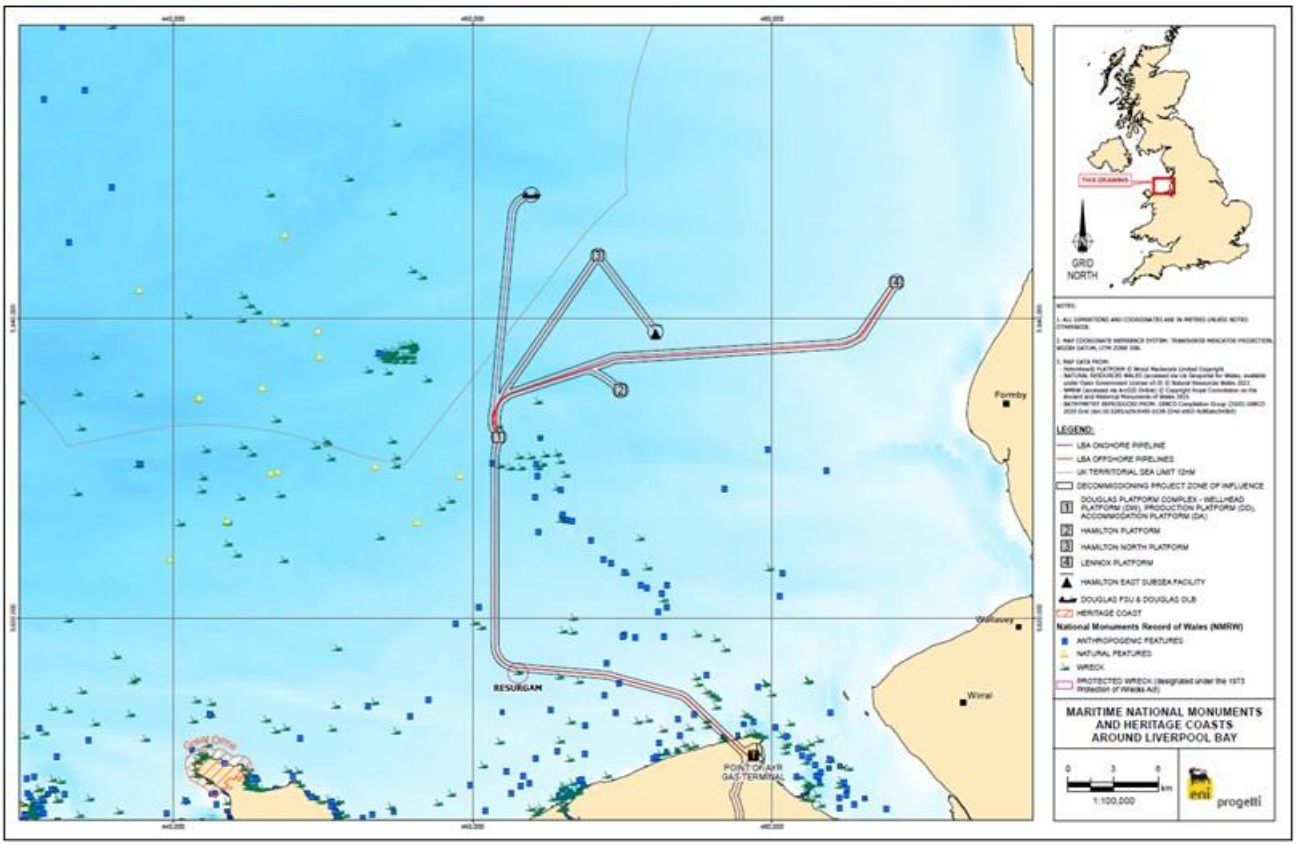

Figure 6-21: Maritime National Monuments within the LBA Project Area

6.5.8 Recreational Activities

Recreational sailing is generally divided into two categories: offshore and inshore. Offshore sailing is usually undertaken by yachts in the form of either cruising or organised offshore racing. Cruising may include day trips between local ports and often includes a return journey to the home port on the same day.

The Royal Yachting Association (RYA) data is limited to inshore waters, but Automatic Identification System (AIS) data tracks show that recreational vessels transit through offshore waters within the infrastructure and other sea users local study area. There is medium to low recreational activity over the majority of the infrastructure and other sea users local study area.

Sea fishing trips run from Conwy, North Wales and specialise in wreck fishing, deep sea fishing and reef fishing from Anglesey to Liverpool Bay (Sea Fishing Trips in North Wales, 2022). Sea fishing trips also operate from the Isle of Man (Manx Sea Fishing, 2022) and Fleetwood, Lancashire (Blue Mink Boat Charters, 2022) amongst other ports along the coasts of the east Irish Sea.

7.0 ENVIRONMENTAL ISSUES IDENTIFICATION

Potential environmental and societal impacts arising from the planned platforms decommissioning have been assessed during two sessions:

- Phase 1 Environmental Impact Identification ENVID – this assessed the topsides removal required to enable the CCS development [1023D0BFRV09505]
- Environmental Risk Assessment Review – Assessed the additional subsea removal scopes required to enable the CCS installation.

7.1 Impact Assessment Methodology

In order to assess significance of potential impacts associated with the LBA Partial Decommissioning Programme, the project followed the ENI Procedure for the Identification of Environmental Aspects (HSE IMS B1-SYS-03 rev. 01) and ENI UK HSE Risk Management Procedure (UK HSE IMS B1-SYS-01 rev. 03).

This method of evaluation was applied to all activities and related aspects identified as having the potential to interact with the environment and to cause environmental or societal impacts. Significance was classified as Low, Medium, Medium-High and High. Suitable controls and mitigation measures were then captured such that the potential impacts would be avoided or reduced to as low as reasonably practicable (ALARP).

The potential impacts were then reassessed to determine if the overall significance had been reduced. This process enabled identification of aspects thought to be potentially significant and aspects that could be scope out; therefore, focusing the need for further assessment.

7.2 Assessment Results

The results of the environmental risk assessment workshops are provided are summarised in Table 7-1. The scoping exercise identified that there were no aspects considered to have high or medium-high impact to identified receptors. The following aspects were considered to present a medium impact to at least one receptor and required comprehensive assessment:

- Seabed disturbance

All other aspects were identified, which following implementation of mitigation measures described in this section have a low significance, are not considered to require further assessment:

- Underwater noise
- Physical presence
- Marine Discharges
- Energy use and atmospheric emissions
- Waste generation
- Unplanned events

Due to LBA Field Area location within the network of MPAs, the further assessment includes sections on the potential impacts to integrity of the site / conservation objectives from the identified aspects. Cumulative effects, in-combination impacts and transboundary issues were all considered to have low significance and additional description has been provided to explain this conclusion.

Table 7-1: Impact Assessment Summary

Activity	Aspect	Air Quality	Use of	Water quality	Seabed	Benthos	Plankton	Fish and	Marine	Seabirds	Conversation	Fisheries	Shipping	Other sea	Disposal	Interested	Cumulative	In-combination	Transboundary
Subsea Removals	Abrasive cutting discharge (i.e. garnet)		E1	E1	E1	E1	E1	E1	E1		E1								
	Excavation, burying and removal of subsea pipeline sections, spools, directional positioning (DP(b) thrusters (LN only) and buried / unburied matresses		E1	E2	E2	E2	E2	E2	E2		C2							E2	
	In situ marine growth removal – Removal only for access			C1	C1	C1	C1	C1			C1								
	Use of cutting tools							E1	E1	E1	E1								
	Sonar (for measuring water depth) (underwater noise)							E1	E2	E1	E1								
	Pipeline Trenching operations, noise from use of trenching machine							E1	E1	E1	E1								
	Discharges from pipeline cutting activities			E1	E1	E1	E1	E1	E1	E1	E1								
	Removal and disposal of subsea pipelines (ferrous metal, concrete, and plastic)	E1											E1		E1		E1	E1	
	Removal and disposal of mattresses, and grout bags (plastic and concrete)	E1											E1		E1		E1	E1	
	NORM														A1		A1	A1	
Topsides Removal	Cutting of topsides	E1			E1														
	Lifting of topsides			D1	D1					D1	D1						D2		
	Removal of equipment			D1	D1					D1	D1								
	Transboundary shipment of waste														D2	D1	D2		
	Failure during lift (unplanned event)			B3	B3						B3			B2					
Vessel Activities	Presence of DSV / Reel Lay / Cut and Lift Vessel (includes transit to and from port)	E1	E1	E1			E1	E1	E1		E1	E1	E1	E1				E1	
Vessel Operations	Fuel consumed by offshore vessels, diesel-powered equipment and generators	E1																	
	Routine vessel discharges to sea			E1	E1	E1	E1	E1	E1	E1	E1								
	Use of propellers / DP(b) thrusters on vessels							E1	E2	E1	E1								
	Introduction of invasive species (from ballast water)					A1	A1	A1			A1								

7.3 Aspects Not Requiring Further Assessment

During the environmental risk assessment workshop, some aspects were considered as having low significance; however, consideration was also given to the standard operating procedures of Eni UK and mitigation measures planned for implementation, which are described in the following subsections. It is considered these aspects are 'scoped out' from requiring further assessment and have not been included in detailed assessment undertaken in Section 8.0.

7.3.1 Underwater Noise

The use of sonar, cutting tools and dynamic positioning will all create underwater noise which could cause potential behavioural disturbance or physiological impacts to sensitive marine fauna. Operations will be planned to reduce vessel movements and minimise the overall duration of the project. All works will also be undertaken with relevant consents in place to minimise impacts to marine mammals.

7.3.2 Physical Presence

The vessels required for any of the considered removal options will be present on location within the 500m safety exclusion zone surrounding each of the LBA platforms being reused for the CCS project, which is clearly marked on navigation charts and has been in place for a number of years. Use of anchor lines may result in additional exclusions zones within close proximity to the existing 500m safety exclusion zone; however, this is unlikely to present additional hazard to shipping or fishing vessels which would not usually transit immediately adjacent to an existing exclusion zone. Where a large HLV is required, which will have anchor lines extending beyond the 500 metre exclusion zone of the platform, appropriate Consent to Locate application will be made, existing collision risk management plans will be reviewed and notification will be made to regular users of the area via fisheries notices, Notices to Mariners and NAVTEX/NAVAREA warnings. The type of vessels required for the project and estimated durations are summarised in Table 7-2 below.

Table 7-2: Vessel Durations

Vessel	Douglas CCS Installation + Decom works	Lennox	Hamilton	Hamilton North	Total
Topside Works	Number of Vessel Days				
W2W (Jack-up)	N/A	80.00	80.00	80.00	240.00
HLV	N/A	8.00	8.00	8.00	24.00
Cargo Barge and Tugs (3 x CB + 5 Tugs)	N/A	40.00	40.00	40.00	120.00
Subsea Works	**Number of Days Subsea Removals**				
DSV 1	60.00	50.00	55.00	55.00	220.00
DSV 2	60.00	50.00	55.00	55.00	220.00
CSV	25.00	25.00	25.00	25.00	100.00

Transportation vessel and support vessel will travel from / to the coast (destination currently unknown) for the duration of the project, however, in the wider context of traffic in the southern North Sea, the impact on other sea users from these additional boat movements is considered to be negligible. Operations will be planned to minimise the number of boat movement, as far as reasonably practicable.

7.3.3 Energy Use and Atmospheric Emissions

Atmospheric emissions will be produced as a result of the fuel consumed by offshore vessels, equipment and generators. The main environmental effects of the emission of gases to the atmosphere are:

- Direct or indirect contribution to global warming (carbon monoxide [CO], CO_2, methane [CH_4] and nitrous oxide [N_2O]);
- Contribution to photochemical pollutant formation and local air pollution (particulates, nitrogen oxides [NOx], sulphur oxides [SO_x], volatile organic compounds [VOCs]).

Emissions from offshore vessels will be generated from lifting, transportation and support. These emissions may result in slight short term reduction of the air quality in the immediate vicinity of the operations; however, the contribution to the worldwide levels of atmospheric emissions is negligible. In addition, due to the exposed and generally windy conditions offshore, the gaseous emissions would disperse rapidly after release, ensuring there was no local cumulative effect of pollutants. Therefore the environmental impact of associated atmospheric emissions is considered to be of low significance.

Preparation and cutting of the topsides will involve the use of diesel-powered equipment and generators. The atmospheric emissions generated from dismantling are not expected to be significantly greater than those created from the usual operation of the platforms for the production of gas.

All vessel movements will be optimised. All engines, generators and other combustion plant on the vessels will be maintained and correctly operated to ensure that they were working as efficiently as possible to minimise emissions. The design of the removal programme will ensure that the time between the various lifting activities is reduced as far as is practicable to minimise total HLV time offshore. The HLV transit time is a major factor in the amount of emissions generated. The intention of the project is to select a dismantling location close to the LBA Field, if possible, which will optimise time, reduce fuel consumption and the associated emissions.

7.3.4 Waste Generation

Good housekeeping standards will be maintained on board all vessels in accordance with the project waste management strategy; any wastewater discharged to sea from vessels will be treated to comply with the requirements of the MARPOL Convention.

A Materials Inventory has been developed for the Project to identify the types of waste generated and the management procedures for each waste stream will be included in a project Waste Management Plan. Eni will ensure the principles of the Waste Management Hierarchy are followed during the decommissioning activities. Transfer notes will accompany all non-hazardous waste to shore and consignment notes will be in place for any hazardous waste.

Checks will be carried out on the selected waste yard to ensure all permits and licenses are in place for the handling and disposal of the waste types identified. Eni will ensure that waste is transferred by an appropriately licensed carrier who should have a Waste Carrier Registration, Waste Management Licence or Exemption, as appropriate for the type of waste.

The impacts of waste management are largely onshore and therefore outside the scope of this document. A large proportion of project waste consists of easily reprocessed scrap metal and there will be limited quantities of hazardous waste. Implementation of a robust waste management plan will mitigate any expected impacts and therefore the impacts associated with waste generation are considered to be of low significance.

7.3.5 Unplanned Events

Failure during lifting was considered to have a medium environmental impact before mitigation was considered. All lifting operations will be undertaken in line with stringent lifting plans which mean lifting operations can only be carried out in safe conditions. Weather reports shall be reviewed before planning an operation and lifts will only be carried out if there is a clear weather window for seven days. All lifting plans will also be approved by the Marine Warranty Surveyor (MWS). The MWS will also approve the vessel and lifting equipment as fit for purpose. With these mitigations in place the risk of a failure whilst lifting can be considered low.

7.3.6 Cumulative Impacts

It is recognised that other works in the area may have similar impacts that, cumulatively, may result in greater impact to receptors. The impact assessment process therefore considered the potential cumulative for all identified aspects.

Xodus (2020) Report presents that the LBA Field has high traffic density, identifying 13,399 vessels per year passing within 10 nm of the Douglas Platform, corresponding to an average of approximately 37 vessels every day. The decommissioning work will be taking place primarily within the existing 500 m safety exclusion zone surrounding the installations. In addition to this the field Collision Risk Assessment (CRA) shall be updated to take decommissioning activities into account and all management measures recommended shall be adopted. No significant cumulative effects on shipping or navigation are therefore predicted.

The Awel y Môr Offshore Wind Farm project is being developed by RWE Renewables (RWE) to the west of the existing Gwynt y Môr Offshore Wind Farm. The Awel y Môr Offshore Wind Farm will be located approximately 10.5km off the Welsh coast in the Irish Sea, with a maximum total area of 78 km^2. This Project, which is to the west of the LBA Field, will also require a number of ship movements. This could have a cumulative impact in terms of impacts on birds, benthic communities, noise, temporary marine congestion or an increased risk of accidents and is considered to be a potentially negative. The wind farm is planned to be operational in 2030 which is after the commencement of CCS operation; therefore, the impact can be considered low.

7.3.7 In-combination Impacts

A review of consented projects occurring within the SPA was undertaken to identify any possible in combination effects to the protected features of the Liverpool Bay SPA in terms of vessel presence and seabed disturbance. A review of windfarm projects occurring within the SPA was also undertaken to identify any possible in combination effects to the protected features of the Liverpool Bay SPA in terms of infrastructure presence. For red-throated divers and common scoter, a displacement buffer of 10km has been applied for the windfarms within the Liverpool Bay SPA (JNCC, 2022). Whilst 10km may not be required for all directions from a windfarm as displacement of the foraging species is unlikely to be uniform, this 10km buffer is expected to be sufficient as per the SNCB advice (JNCC, 2022).

The proposed works have the potential to interact with several other projects occurring within the Liverpool Bay area. There will also be a cumulative impact to the displacement disturbance to red-throated divers and common scoter with operational windfarms within the SPA. In a worst-case scenario, the presence of the operational vessels could temporarily prevent or reduce access to foraging seabirds in the Liverpool Bay SPA boundary.

Given the wide extent of available foraging areas within the region, the continual nature of other activities in the area and the background levels of disturbance present due to large amounts of vessel traffic utilising the Port of Liverpool, it is considered species will have plentiful foraging opportunities and will have habituated to ongoing sources of disturbance. Therefore, when combined with the proposed operation cumulative impacts are not considered to have a significant effect to the designated features of the Liverpool Bay SPA and the impact is assessed as low.

7.3.8 Transboundary Impact

The Project area is located approximately 112 km from the median line of Republic of Ireland and 62 km from median line of the Isle of Man (Table 7-3). At this stage in the Project there remains potential for Transfrontier Shipment for disposal. Transboundary impact has therefore been considered for all identified aspects.

Any impacts arising from emissions, discharges and seabed disturbance generated as a result of the proposed project are predicted to be highly localised and are therefore not expected to result in any significant transboundary impacts. If the project decides to utilise disposal options outside of the UK, evaluation of

transboundary impacts associated with Transfrontier shipment will be completed in accordance with the Convention on Environmental Impact Assessment in Transboundary Context (as amended) (UNTC, 2017).

Table 7-3 Distance to Transboundary Lines

Distance to Transboundary lines (km)	Douglas	Lennox	Hamilton	Hamilton North
Republic of Ireland	112	138	120	118
Isle of Man	67	79	70	62

8.0 ENVIRONMENTAL ASSESSMENT

During the initial screening, the following aspects were considered to have potential significant impact and were selected for more detailed assessment:

- Seabed disturbance
- Potential Impact to nesting seabirds

The assessment has been completed with an indication of the predicted effectiveness of mitigation measures and a statement of whether, with the commitment of additional controls, impacts identified for further assessment are reduced to ALARP. Impacts to marine protected areas have been assessed and summarised in Section 9.0.

8.1 Seabed Disturbance

The following decommissioning activities have been identified to potentially result in seabed disturbance:

- Preparation works which may utilise a HLV Jack-up vessel that may use spudcans for stability.
- Excavation of sediment for access to cutting locations for pipeline section and spool removal, including potential smothering from sediments entering the water column and then settling on the surrounding seabed.
- Removal of mattresses and stabilisation material to access cutting locations, including setting aside removed materials.
- Anchoring and anchor line scour from standoff to working locations, including sediment re-suspension and settlement.

8.1.1 Quantification of Seabed Disturbance

Seabed disturbance is expected to be primarily within the existing 500m exclusion zone of the platforms being reused for CCS.

Vessels utilised are anticipated to use DP(b) which, due to the shallow water depths in the LBA field, may lead to some localised seabed disturbance caused by the thrusters.

The significant seabed disturbance will be cause by the planned seabed removal scopes around Douglas, Lennox, Hamilton and Hamilton North. There is a requirement to remove areas of seabed infrastructure (pipeline sections and spools) to enable the installation of the CCS topsides at the satellite platforms and to allow for pipeline tie-ins at the new Douglas CCS platform.

Table 8-1 shows the anticipated area of seabed disturbance at each platform. Details of the area impacted can be found in the associated layout drawings (Figure 8-1 to Figure 8-4)

Area of Seabed Disturbance				
Douglas	Hamilton	Hamilton North	Lennox	Total
27,714	4,284	13,506	6,542	52,046

Table 8-1 Seabed Disturbance (m^2)

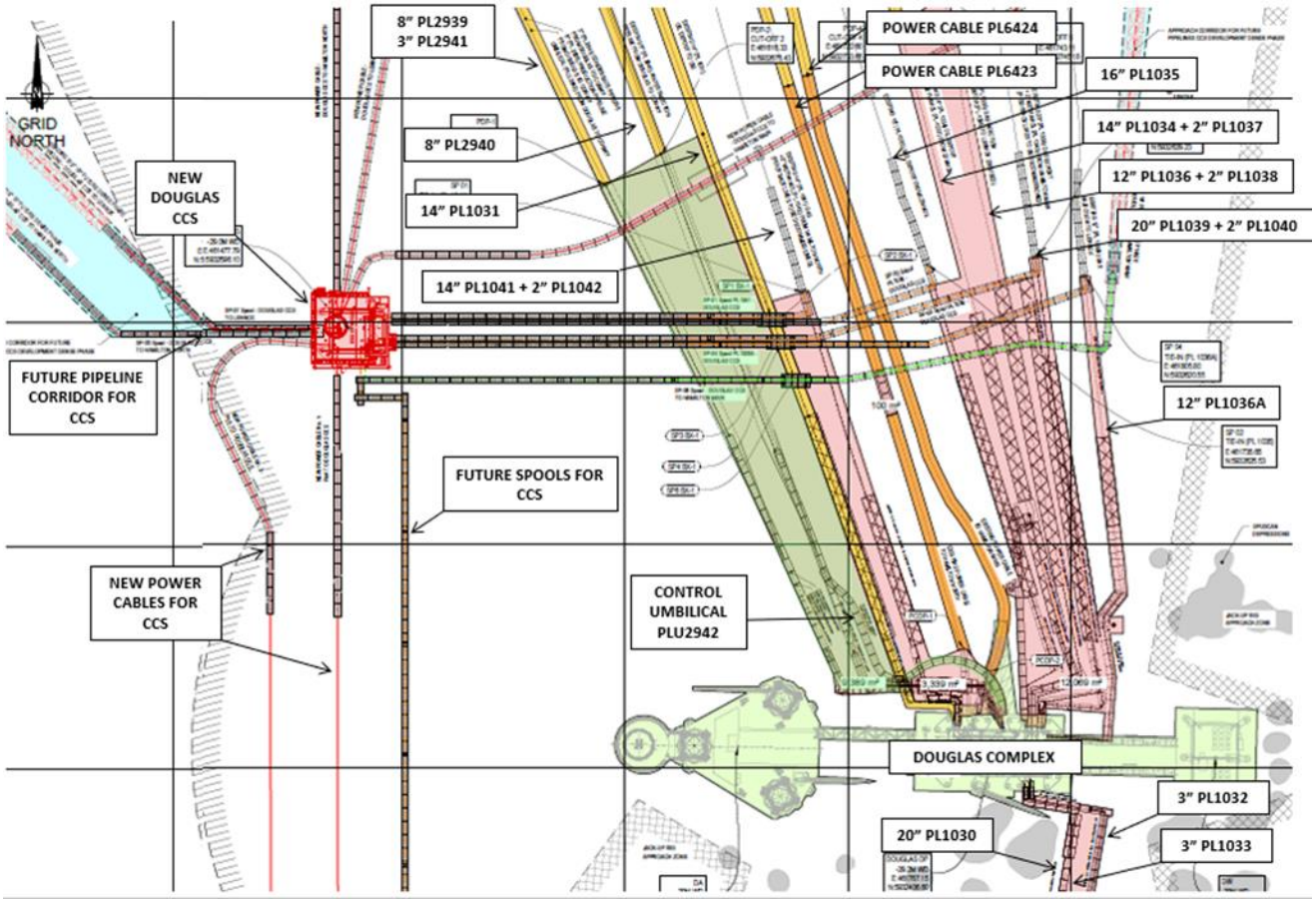

Figure 8-1 Seabed Removals around Douglas Platform

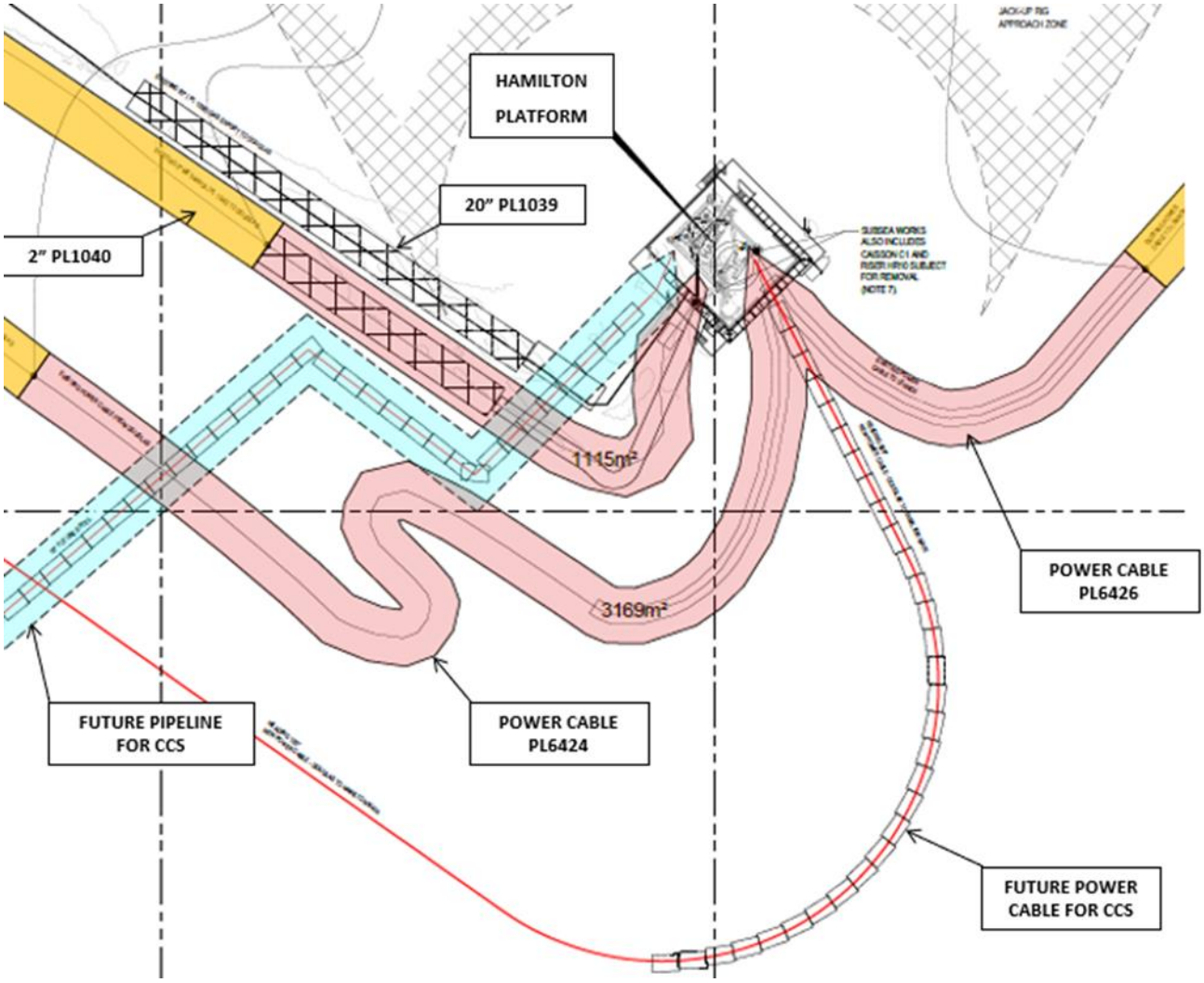

Figure 8-2 Seabed Removals around Hamilton (HH) Platform

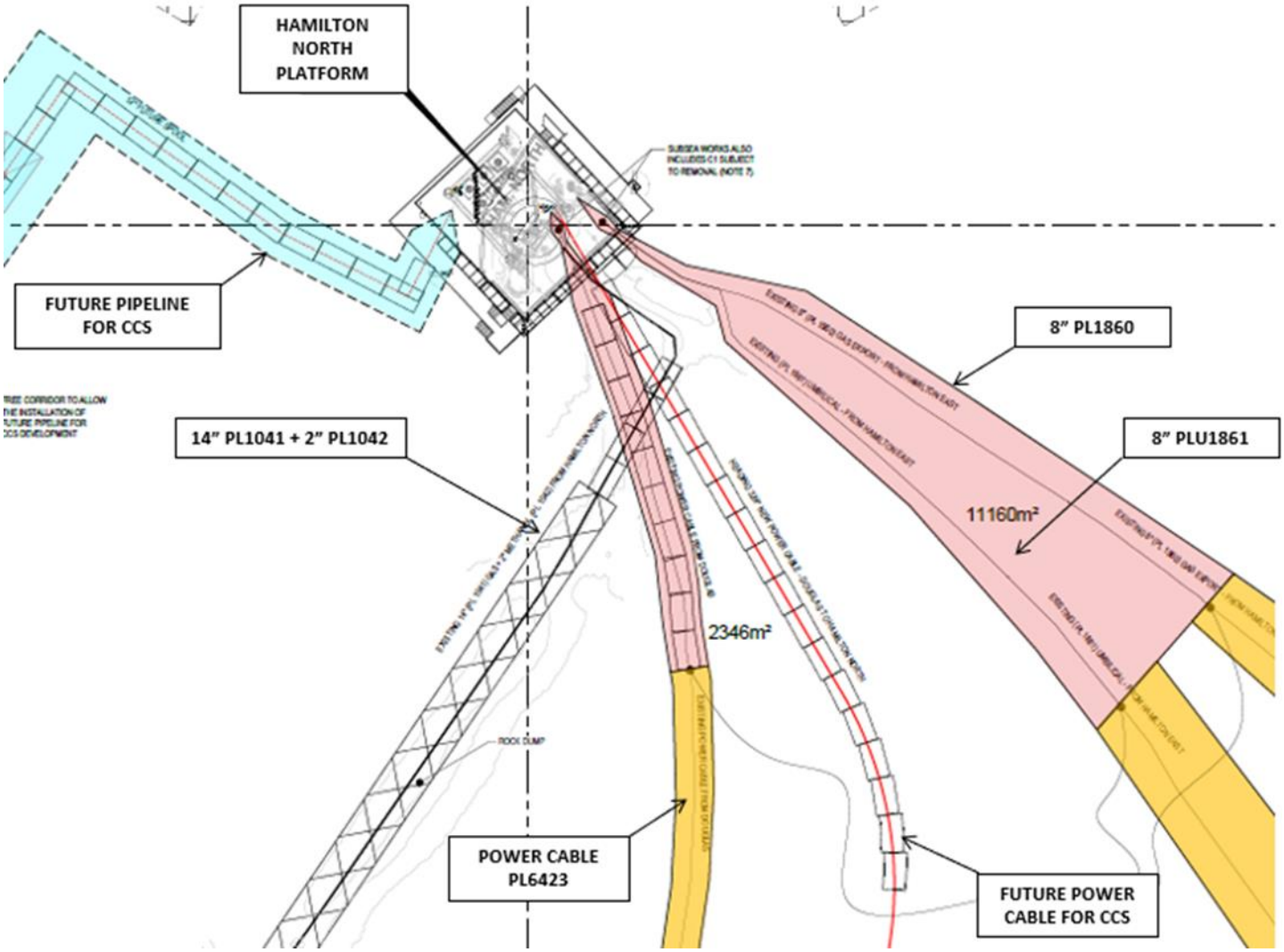

Figure 8-3 Seabed Removals around Hamilton North (HN) Platform

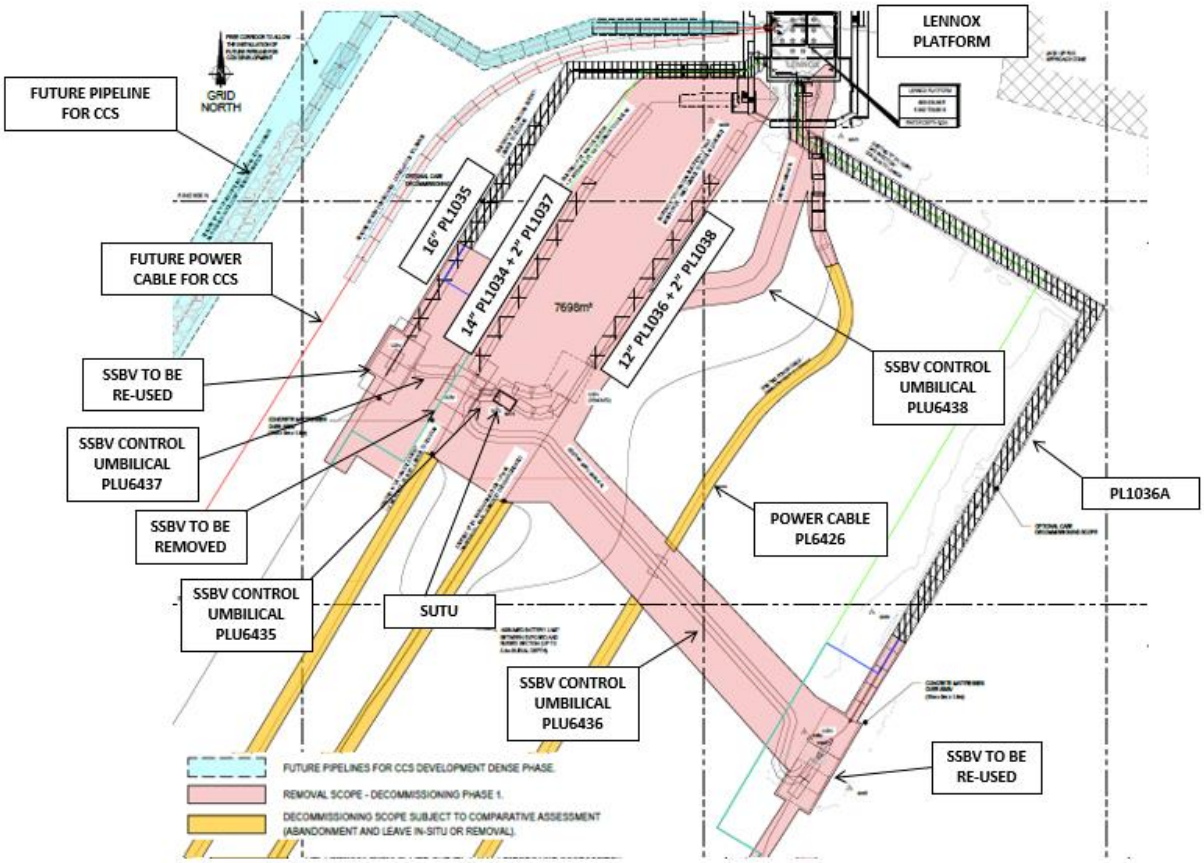

Figure 8-4 Seabed Removals around Lennox (LD) Platform

8.1.2 Potential Impacts to Seabed Communities

The seabed removals are expected to cause benthic mortality in the localised area. The total area of seabed disturbance caused by the removal of pipeline sections and associated mattresses is approximately 42,906m2 across 4 different locations. This limited area of seabed disturbance is not anticipated to have a longterm negative impact on benthic communities in the area.

DP(b) thrusters may also cause localised seabed disturbance due to the shallow waters throughout the LBA field however, due to the high turbidity of the seabed in the area

Use of the HLV is a transient operation and, as such, it is expected that recovery of affected areas of seabed will be relatively rapid once the HLV has completed the lift. Re-colonisation of the affected areas is anticipated to take place in a number of ways; including mobile species moving in from the edges of the area, juvenile recruitment from plankton or from burrowing species digging back to the surface. The impact to seabed communities as a result of physical damage from the thrusters of the HLV is therefore considered to be low.

Physical disturbance as a result of the subsea removals can cause mortality or displacement of benthic species in the impacted zone via direct loss of habitat and direct mortality of sessile seabed organisms that cannot move away from the impacted area. The sandy gravel / gravelly sand substrate that is predominant in the area is expected to support a rich, diverse and even fauna characterised by high abundance of the tubeworms *Spirobranchus triqueter* and *Hydroides norvegicus* and the ascidian *Dendrodoa grossularia* (Shalla *et al*., 1996). The main impact will be direct mortality of sessile and low motility seabed fauna that is not able to relocate from the impacted area.

Post-disturbance recovery of the seabed and associated biota is dependent both on the strength of the seabed soils and the ability of the hydrological regime to rework disrupted sediments and return the seabed to its original contours. The seabed in the LBA Field area is predominantly composed of unconsolidated sand and gravel, and is therefore amenable to reworking. The shallow water depth in the area allows wave action to combine with tidal currents to generate relatively high shear strengths at the seabed and this is likely to lead to rapid reworking of the affected sediments. Given the strong current regime in the area, transport of larvae and juvenile organisms into the affected area and re-colonisation of the sediments is also expected to be relatively rapid. The impact to seabed communities from increased turbidity caused by excavations and anchor deployment is therefore considered to be low.

Retrieval of mattresses and other stabilisation materials will result in hard and/or coarse substratum habitats being replaced by sediment habitats, more typical of the area. Temporary placement of equipment and mattresses will cause direct mortality to marine fauna directly below the placement, however, these areas will already be impacted due to the excavation or previous placement of mattresses. The area of the pipeline cut end requiring stabilisation is already covered in mattresses, so although mattresses will be removed, the pipeline cut and the mattresses replaced, the area will continue to remain unchanged. As a result of the changes in seabed substrata there will be subsequent localised changes in benthic communities from epifaunal species that can colonise hard substrata to those that favour of soft sandy sediments. The impact to seabed communities as a result of the retrieval of mattresses and other stabilisation materials is therefore considered to be low.

8.1.3 Potential Impacts to Fish Spawning and Nursery Grounds

Rare or protected species present in the Liverpool Bay area include basking shark (*C. maximus*), common goby (*P. microps*), sand goby (*P. minutus*), Allis shad (*A. alosa*) and Twaite shad (*A. fallax*). Also present in the area are salmon (*S. salar*), river lamprey (*L. fluviatilis*), sea lamprey (*P. marinus*) and smelt or sparling (*Osmerus eperlanus*) (Lockwood, 2005).

Demersal fish will be temporary displaced from an area of ca. 42,906 m^2. In addition, commercially and ecologically important fish species such as cod and sandeels, both of which have spawning grounds in the vicinity of the project, lay their eggs only in clean sandy and gravelly sediments. Given the mobile nature of demersal fish species, any displaced fish are likely to find suitable spawning areas in adjacent locations. The spawning grounds for both cod and sandeels in the vicinity of the project area are part of wider spawning grounds for these species in the Irish Sea and the area is not considered to be critical spawning habitat for these species.

Exposure to increased turbidity through sediment resuspension may also temporarily displace fish species from their spawning and nursery areas and reduce the visual acuity of fish potentially affecting foraging behaviour. However, any disturbance of this nature is considered to be highly localised and of short duration and mobile species would be expected to return shortly after cessation of the operations.

Egg development and hatching success is also vulnerable to the effects of smothering. A number of studies have been conducted on the effects of sedimentation on fish egg development of commercially valuable fish species, particularly in relation to dredging operations. Results are variable with some demonstrating mortality of fish eggs when smothered by even a thin veneer of sediment (DOER, 2000) and many studies showing no significant effects on fish egg and larval development and mortality (Auld and Schubel, 1978; Kiørboe *et al*., 1981).

Once the works are completed the seabed sediments are likely to re-settle and be subject to the natural tidal influences in sediment transport in the area. Given the above, the impact to fish spawning and nursey grounds from physical disturbance, increased turbidity and smothering is therefore considered to be Minor.

8.1.4 Mitigation

The following measures will be adopted to ensure that seabed disturbance and its impacts are minimised to as low as reasonably practicable:

- Removals will be planned, managed, and implemented in such a way that seabed disturbance is minimised.
- All work will be undertaken under a marine license.
- Duration of vessels in the field, will be minimised as much as possible.
- Tool use will be minimised where feasible whilst still achieving the desired result.
- Where cutting of pipelines requires removal of mattresses and other stabilisation materials, temporary placement of equipment will be within the footprint of planned excavations and mattresses will be reused, where possible, to minimise seabed disturbance.

Post-disturbance recovery of the seabed and associated biota is dependent both on the strength of the seabed soils and the ability of the hydrological regime to rework disrupted sediments and return the seabed to its original contours. The seabed in the proposed operations area is predominantly composed of unconsolidated sand and gravel and is therefore amenable to reworking. The shallow water depth in the area allows wave action to combine with tidal currents to generate relatively high shear strengths at the seabed and this is likely to lead to rapid reworking of the affected sediments. Given the strong current regime in the area, transport of larvae and juvenile organisms into the affected area and re-colonisation of the sediments is also expected to be relatively rapid.

8.2 Potential Impact to Nesting Seabirds

Environmental assessment undertaken and described in Section 7.0 demonstrates decommissioning activities are not expected to cause significant impact on seabirds using offshore facilities as artificial nesting sites. However due to fact Annex 1 birds being one of the reasons Liverpool Bay site being qualified as an SPA, and that there are known nests on the assets to be decommissioned, this further assessment and mitigation methods been carried out.

In recent years, there has been an increase in the number of seabirds utilising offshore installations for nesting. Opportunistic species such as kittiwake and herring gull are utilising artificial nest locations and successfully rearing chicks. Although for most offshore platforms, the number of breeding birds remains very low. All nesting birds and nesting activities are protected from damage by conservation legislation. Under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2017 – (OMR 17), it is an offence to:

- Take, damage, or destroy the nest of any wild bird while that nest is in use or being built
- Take or destroy an egg of any wild bird.

This legislation is relevant to installations more than 12 nautical miles from the coast, applies to all species of bird and applies irrespective of the number of nests found; i.e., there is no *deminimus*.

Eni has been engaging EMT and SNCBs on the topic of nesting birds on LBA since 2021. Eni has been undertaking nesting birds surveys since 2022, ahead of any decommissioning works. Eni has formulated a nesting birds strategy that proposes solutions to limit the potential implications of nesting birds on decommissioning plans. Eni engages EMT regularly on the nesting birds and on updates to its strategy.

9.0 POTENTIAL IMPACTS TO MARINE PROTECTED AREA

Within Liverpool Bay and its surrounding coastline there are a number of sites designated for their nature conservation importance including:

- SPA
- SAC
- Ramsar Sites
- SSSI
- Recommended Marine Conservation Zones (rMCZ).

Marine and coastal protected areas lying within 40 kilometres of the offshore Liverpool Bay assets are illustrated in Figure 6-2 and the summary of the sites is provided in Table 6-2.

All offshore LBA installations lie within or in very close proximity to Liverpool Bay SPA, which lies almost entirely in UK territorial waters adjacent to the following counties and/or unitary authorities: Lancashire, Blackpool, Merseyside, Sir y Fflint / Flintshire, Conwy, Gwynedd, Ynys Môn / Isle of Anglesey and a small portion sits within Sir Ddinbych and/or Denbighshire unitary authority.

The following subsections assess the likely significant effect of decommissioning operations on the coherence of the identified protected sites, to ensure the objectives of each of the sites are not compromised.

9.1 Liverpool Bay SPA

The total area of the Liverpool Bay SPA is approximately 252,757.73 ha or 2,528 km^2. During 2017, proposed boundary changes to the existing Liverpool Bay SPA were approved. The additional areas in this Liverpool Bay SPA extension encompass 82,481 ha, an increase of 48.4% from the previous SPA, with the new area now including the Hamilton and Lennox platforms.

The Liverpool Bay site qualifies as a SPA for the following reasons:

- Regularly supports more than 1% of the GB populations of one species listed in Annex 1 of the EC Birds Directive.
- Regularly supports more than 1% of the bio-geographical population of one regularly occurring migratory species not listed in Annex 1 of the EC Birds Directive.
- Regularly supports more than 20,000 waterfowl during the non-breeding season.

The site comprises of a large marine area and sea inlets. In the non-breeding season, the area regularly supports over 55,000 waterfowl including Red-throated loon *Gavia stellata* and Common scoter *Melanitta nigra*.

SPA: The area has been designated under the Birds Directive as regularly supporting over winter species red-throated loon (*G. stellata*) and common scoter *(M. nigra*) as well as an internationally important assemblage of waterfowl. Additionally, the boundary of the existing marine SPA has been extended to provide protection for little gull (*Hydrocoloeus minutus)* and extend further inshore to offer protection to foraging common tern (*L. hirundo)* and little tern (*S. albifrons).*

The conservation objectives for the protected features of the SPA are to ensure that subject to natural change, the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring the following aspects:

- Extent and distribution of the habitats of the qualifying features
- Structure and function of the habitats of the qualifying features
- Supporting processes on which the habitats of the qualifying features rely

- Population of each of the qualifying features
- Distribution of the qualifying features within the site.

As this region of the Irish Sea is already subject to high densities of vessel traffic, the additional presence of project vessels for the duration of the proposed decommissioning operations are unlikely to cause significant disturbance to seabirds inside or outside the SPA boundary.

The increased use of vessels from decommissioning and the LBA CCS Project activities will add very few additional daily vessel movements. Currently, approximately 50-60 vessels utilise the LBA CCS Project Shipping and Navigation Study Area (LBA CCS Hynet CO2 T&S Project Offshore Environmental Statement Chapter 9). The construction of the LBA CCS Project will add on average an additional two vessels to this baseline.

Disturbance to the seabed, may reduce the availability of the prey on which the protected bird species feed; however, only a small area of seabed will be disturbed by the proposed decommissioning activities and the majority of this is outside of the SPA boundary. Additionally, the proposed decommissioning activities are not expected to have a significant impact on fish populations. Thus, any effect on seabird prey is considered to be negligible.

Seabird populations are also particularly vulnerable to surface pollution, however, there is insufficient liquid hydrocarbon inventory associated with the Partial Decommissioning programme to result in significant damage to the environment. Spill prevention measures will also be in place.

Given the reasons outlined above, the proposed decommissioning activities will not significantly alter the extent, distribution, structure and function of the habitats of the qualifying bird species, the supporting processes on which these habitats rely, nor the population or distribution of the qualifying bird species. Therefore, in view of the conservation objectives of the SPA, no LSE on the Liverpool Bay SPA are predicted, as a result of the proposed decommissioning activities either alone or in-combination with other plans or projects.

9.2 Menai Strait and Conwy Bay SAC

The Conway Bay SAC is located approximately 24Km SE from the Douglas Complex. The site comprises a wide variety of habitats such as a large marine area and sea inlets that support a wide range of marine species. Examples of which include the shrimps (*Haustorius arenarius* and *Bathyporeia sarsi)* and colonies of sponges, such as the breadcrumb sponge (*Halichondria panicea)* which grow to unusually large sizes, with single colonies covering areas of over 1 m^2.

The Annex 1 habitats that are a primary reason for the selection of this site include the following:

- **1110 <u>Sandbanks which are slightly covered by sea water all the time</u>**

  Menai Strait and Conwy Bay between mainland Wales and Anglesey includes the Four Fathom Banks complex, which is a relatively rare type of subtidal sandbank in Wales, in that it is comparatively large, and is fairly sheltered from wave action but situated in an area of open coast. The sandbanks vary from stable muddy sands in areas that experience weak tidal streams to relatively clean well-sorted and rippled sand in the outer area of the bank where tidal streams are stronger. In very shallow waters, particularly in the inner shore areas, relatively species-rich sandy communities are dominated by polychaetes such as *Spio filicornis*. In some years when numbers of bivalves are high, internationally

important flocks of common scoter (*M. nigra)* have been observed to congregate in the area of the Four Fathom Banks complex to feed.

- **1140 <u>Mudflats and sandflats not covered by seawater at low tide</u>**

  The intertidal mudflats and sandflats of the Menai Strait and Conwy Bay on the north Wales coast include Traeth Lafan, the shores of the Menai Strait, and the Foryd estuary. Traeth Lafan is an example of an almost fully marine extensive mud and sandflat that experiences a broad range of wave exposure, providing a range of sediment types with typical associated communities. For example, the shrimps (*H. arenarius* and *B. sarsi)* are found in mobile clean sand, whilst bivalves such as the cockle (*Cerastoderma edule)* the gaper (*Mya arenaria)* and Baltic tellin (*Macoma balthica)* are common in more sheltered fine and muddy sand. The sand-mason worm (*Lanice conchilega)* is found in more tide-swept areas. The mixed sediment shores between Beaumaris and Lleiniog are highly productive shores that are rich in animal and plant species. These shores include a nationally important biotope that is rare in the UK. The nationally scarce dwarf eelgrass (*Zostera noltei)* is also found at this site.

- **1170 <u>Reefs</u>**

  The reefs of the Menai Strait and Conwy Bay between mainland Wales and Anglesey include the tidal rapids of the Menai Strait, and limestone reefs along the south-east Anglesey coast and around Puffin Island and the Great and Little Ormes. The environmental conditions of the Menai Strait are unusual. The water is relatively turbid, containing a relatively high level of suspended material, and although the area is largely sheltered from wave action tidal streams are strong, reaching up to 8 knots (4 m s^{-1}) in places during spring tides. As a result, the rocky reefs of the Strait are dominated by a diverse and unusual mixture of animals that feed mainly by filtering their food from the seawater. For example, colonies of sponges, such as the breadcrumb sponge (*H. panicea)* grow to unusually large sizes, with single colonies covering areas of over 1 m^2. The limestone reefs are home to several species that bore into rock, and some limestone specialists are restricted to this relatively rare habitat. Species include the rock-boring sponge (*Cliona celata)*, piddocks (*Hiatella arctica)*, polychaete worms (*Polydora* sp.) and acorn worms (*Phoronis hippocrepia)*.

Three BSHs, four EUNIS Level 4 (biotope complexes) and one EUNIS Level 5 biotope were identified in the seabed imagery collected across the 168 images taken within the sample stations.

The most commonly encountered classification was A5.44 “Circalittoral mixed sediments”, being identified in 33.3 % (56) of images and was predominantly found in the southern area of the site. This was followed by A5.26 “Circalittoral muddy sand” identified in 48 images and shown in the top right of Figure 9-1.

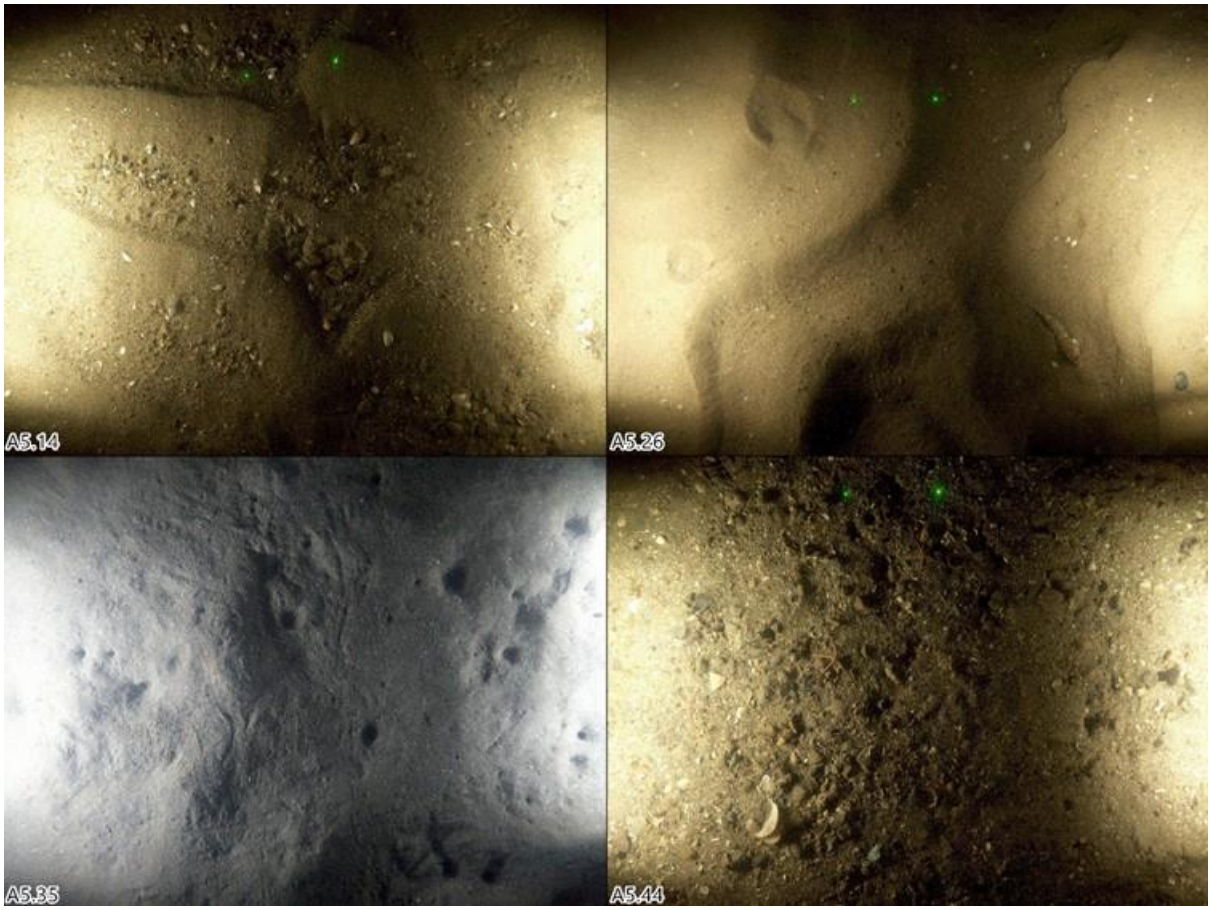

Figure 9-1: Common EUNIS Classifications Identified in Seabed Imagery

Biotope A5.445 '*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittle star beds on sublittoral mixed sediment' was found in 12 images and may occur as part of the Features of Conservation Interest (FOCI) 'Sheltered Muddy Gravels'. Brittle star beds were interspersed within the mixed sediment found in the southern area of the site. No Annex I reef features were found across the site.

Evidence of *S. spinulosa* was identified in two areas; however, there was no evidence of reef forming.

Due to the temporary nature of the works and the mobile seabed conditions as well as the lack of the presence of Annex I species, considering the conservation objectives of the SPA, no likely significant effect (LSE) on the Menai Strait and Conwy Bay SAC is predicted as a result of the proposed decommissioning activities.

9.3 The Dee Estuary (Ramsar, SAC, SPA)

The Dee Estuary SPA is approximately 24km SE of the Douglas Complex. The site consists of large areas of intertidal sand and mud flats with extensive saltmarsh estuary head; important transitional zones occur. The islands of Hilbre and Middle eye support limited amounts of maritime grassland and heathland. The islands also support the only sections of hard cliff in the area; an important habitat of limited distribution within the county. Large colonies of grey seal also occur in the area. Important for up to 90,000 wintering waders and wildfowl. Internationally important concentrations of nine species - oystercatcher, knot, dunlin, bar and black-tailed godwits, redshank, shelduck, teal and pintail. Also, nationally important numbers of wigeon, cormorant and curlew. Migration staging post in spring and autumn particularly for the ringed plover. There are several important roosting sites for oystercatcher, teal and Godwits. Rare saltmarsh species include the slender hare's ear. The presence of the uncommon fish smelt is also of note. The Dee Estuary is also locally designated as a SSSI.

SAC: The site is designated as a SAC due to the presence of Annex I birds and regularly occurring migratory birds not listed on Annex I
SPA: The area qualifies under the Birds Directive and is of special importance within Britain and Europe for supporting a wide range of wildfowl and wader species which use the site as a wintering, breeding and migration area. The site also regularly supports species in internationally important numbers.
Ramsar: The site qualifies under the Ramsar Convention as a wetland of international importance. On the whole the bird interest features for the Ramsar site is the same as that for the SPA and SAC.

The Annex I habitats that are a primary reason for selection of this site include the following:

- **1140 Mudflats and sandflats not covered by seawater at low tide**
- **1310 Salicornia and other annuals colonizing mud and sand**

  The Dee Estuary is representative of pioneer glasswort (*Salicornia* spp.) saltmarsh in the north-west of the UK. *Salicornia* spp. saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia* spp. extending well inland. Associated species often include annual sea-blite (*Suaeda maritima*) and hybrid scurvy grass (*Cochlearia x hollandica)*.

- **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

  The Dee Estuary is representative of H1330 Atlantic salt meadows in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass (*Spartina anglica)*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster (*Aster tripolium)* and sea arrowgrass (*Triglochin maritima)*. In a few areas there are unusual transitions to wet woodland habitats.

The Annex I habitats present as a qualifying feature; although, not a primary reason for selection of this site include the following:

- 1130 Estuaries
- 1210 Annual vegetation of drift lines
- 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts
- 2110 Embryonic shifting dunes
- 2120 "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")"
- 2130 "Fixed coastal dunes with herbaceous vegetation ("grey dunes")" * Priority feature
- 2190 Humid dune slacks.

The Annex II species present as a qualifying feature; although, not a primary reason for site selection include the following:

- 1095 Sea lamprey (*P. marinus)*
- 1099 River lamprey (*L. fluviatilis)*
- 1395 Petalwort (*P. ralfsii)*

In view of the conservation objectives of the SPA, no LSE on the Dee Estuary is predicted as a result of the proposed platform partial decommissioning activities.

9.4 Great Orme's Head (SAC)

Located 28Km SW of the Douglas complex, the site is of national geological importance. The limestone cliffs hold colonies of seabirds including guillemot, razorbill, kittiwake, fulmar and cormorant. The steeper slopes support several plant species, some of which are nationally rare.

SAC: Annex I habitats that are a primary reason for selection of this site are European dry heaths and semi-natural dry grasslands and scrublands. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site, are vegetated sea cliffs of the Atlantic and Baltic coasts.

The Annex I habitats that are a primary reason for selection of this site include the following:

- **4030 European dry heaths**

  This north Wales site is the finest example of limestone heath in the UK. The majority of this rare and unusual vegetation is characterised by a short sward in which heather (*Alluna vulgaris)* and bell heather (*Erica cinerea)* occur in an intimate mixture with a rich assemblage of calcicolous grasses and herbs, such as meadow oat-grass, *Helictotrichon pratense*, and dropwort (*Filipendula vulgaris)*. Other types of dry heath present include various forms of H8, *Calluna vulgaris – Ulex gallii*, heath. There are outstanding zoned sequences of limestone grassland and heath communities and these are associated with a wide range of other habitats, including limestone cliff, scree and a small area of 8240 Limestone pavements.

- **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)**

  Great Orme's Head in north Wales supports one of the largest stands in the UK of CG1 *Festuca ovina – Carlina vulgaris* grassland. There is also an extensive area of CG2 *Festuca ovina – Avenula pratensis* grassland. This is one of only three selected sites in the UK where this *Xerobromion* grassland type occurs. The site contains a wide range of structural types, ranging from short turf on south-facing rocky slopes with abundant hoary rock-rose (*Helianthemum oelandicum)* through more closed calcareous grassland communities to tall herb-rich vegetation on scrub margins. Transitions from calcareous grassland to calcareous and acidic heath, cliff, scree and 8240 Limestone pavements are also well-represented.

The Annex I habitats present as a qualifying feature; although, not a primary reason for selection of this site include the following:

- 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts

In view of the conservation objectives of the SPA, no LSE on the Great Orme's Head SAC is predicted as a result of the proposed platform partial decommissioning activities.

9.5 Ribble and Alt Estuaries (Ramsar, SPA, MCZ)

Located 7km NE of the Lennox Platform, the site comprises an extensive area of intertidal sand-silt flats with

one of the largest areas of grassland marsh in Britain, including small areas of recently reclaimed saltmarsh and is of international importance for the passage and wintering waders and wildfowl it supports many species of international importance. The Southport bird sanctuary provides a protected low tide roost for pink footed geese. The breeding communities of the saltmarsh are also significant and include nationally important breeding populations of black-headed gull, common and Arctic terns, and redshank. The sand dunes to the north of the site are botanically important supporting a number of locally rare species and the nationally rare dune helleborine. The dunes also support an important invertebrate fauna. Under local and national designations the site is also designated as a SSSI and NNR.

SPA: The area qualifies under the Birds Directive and is of special importance within Britain and Europe for supporting a wide range of wildfowl and wader species which use the site as a wintering, breeding and migration area. The site supports more species in internationally important numbers than anywhere in the UK.
Ramsar: The site qualifies under the Ramsar Convention as a wetland of international importance. On the whole the bird interest features for the Ramsar site is the same as that for the SPA.
MCZ: The Ribble Estuary area has been designated as an MCZ to protect the specific features - Smelt (*Osmerus eperlanus*), shoaling fish and to manage marine activities.

In view of the conservation objectives of the SPA, no LSE on the Ribble and Alt Estuaries is predicted as a result of the proposed platform partial decommissioning activities.

9.6 Sefton Coast SAC

Located 7 km NE from Lennox platform, Sefton Coast SAC forms an extensive foreshore zone along the Liverpool Bay complex of estuarine habitats. The sand dunes of the Sefton Coast form the largest dune system in England. Habitats in the area include embryo dunes, mobile dunes, fixed dunes, dune slacks, dune scrub and dune heath. The exposed peat and clay beds are important habitats for a wide variety of marine species.

SAC: Annex I habitats that are a primary reason for the selection of this site include the various dune habitats mentioned previously. Annex II species that are a primary and qualifying reasons the for the selection of this site are the petalwort (*P. ralfsii)* and the Great crested newt (*T. cristatus).*

The Annex I habitats that are a primary reason for selection of this site including the following:

- **2110 Embryonic shifting dunes**

  The Sefton Coast in north-west England displays both rapid erosion and active progradation. Embryonic shifting dunes are of the northern, lyme-grass (*Leymus arenarius)* type and are mainly associated with the areas of progradation, though vegetation dominated by lyme-grass is also found associated with areas of persistent, heavy disturbance further inland.

- **2120 "Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")"**

  A substantial stretch of the Sefton Coast dune system in north-west England is fronted by about 163 ha of shifting dunes. Marram *Ammophila arenaria* usually dominates the mobile dunes, amidst considerable areas of blown sand. Where rates of sand deposition decline, lyme grass (*Leymus arenarius)* sea-holly (*Eryngium maritimum*) and cat's-ear (*Hypochaeris radicata*) occur, with red fescue (*Festuca rubra*) and spreading meadow-grass (*Poa humilis*) present on the more sheltered ridges. Sea spurge (*Euphorbia paralias*) and the nationally scarce dune fescue (*Vulpia fasciculata*) are frequent, while sea bindweed (*Calystegia soldanella*) is very local. Formby Point is the hinge point between two coastal sub-cells. The zone around the Point has been eroding since 1906 while areas

north and south of this zone are accreting (where the nature of the coast allows). The rapid erosion is therefore reducing the area of shifting dunes at Formby, and high, steep eroding dunes abut the beach with extensive areas of blown sand immediately inland.

- **2130 "Fixed coastal dunes with herbaceous vegetation ("grey dunes")" * Priority feature**

Sefton Coast is a large area of predominantly calcareous dune vegetation in north-west England. The sequence of habitats from foredunes to dune grassland and dune slack is extensive, and substantial areas of open dune vegetation remain. There are large areas of semi-fixed and fixed dunes with herbaceous vegetation exhibiting considerable variation from calcareous to acidic. In the calcareous areas common restharrow (*Ononis repens*) is prominent. There are small but significant areas of decalcified sand with grey hair-grass (*Corynephorus canescens)*, a species more characteristic of decalcified fixed dunes in the east of England and around the Baltic.

- **2170 Dunes with *Salix repens ssp. argentea* (*Salicion arenariae*)**

At Sefton Coast on the north-west coast of England there are extensive dune slacks dominated by creeping willow (*Salix repens* ssp. *Argentea)*, making this site particularly important for dunes with *S. repens* ssp. *argentea*. Radley (1994) estimated that 99 ha, or 43% of the total English resource of the main dune slack community dominated by creeping willow occurred here. The species also dominates areas of free-draining dune grassland to a much greater extent than at most other UK sites. Despite some urban and recreational development, both successional and geomorphological processes are still active and the structure and function of the site as a whole is still well-conserved. Management, including partial removal of planted conifers, has taken place in recent years to maintain and enhance these processes.

- **2190 Humid dune slacks**

Sefton Coast is a large area of predominantly calcareous dune vegetation, containing extensive areas representative of Humid dune slacks in north-west England. Some active slack formation can still be seen and a variety of successional stages are represented. The sequence from foredunes to dune grassland and dune slack is extensive. The site contributes to the range and variation of humid dune slack vegetation, being a large and representative base-rich system towards the northern limit for some humid dune slack communities along the west coast of Britain.

The Annex I habitats present as a qualifying feature; although not a primary reason for selection of this site include the following:

- **2150 Atlantic decalcified fixed dunes (Calluno-Ulicetea) * Priority feature**

The Annex II species that are a primary reason for selection of this site include the following:

- **1395 Petalwort** *Petalophyllum ralfsii*

A large population of petalwort (*P. ralfsii*) occurs at Sefton Coast, the only site chosen for this species in north-west England. The plant was first recorded on the Sefton Coast at Ainsdale in 1861 and it is still found within the dune system between Southport and Ainsdale. It seems to prefer damp ground

around the edges of dune slacks of fairly recent origin, with the largest populations found in slacks of less than 25 years old. The plant is often found in association with footpaths, where light trampling keeps the ground vegetation sparse; infrequently used paths or less-trampled edges of pathways seem to be favoured. Although the preferred habitat is short damp turf with plenty of bare patches, populations have been found growing amongst dense marram (*Ammophila arenaria*) with few other associated species.

Annex II species present as a qualifying feature, although, not a primary reason for site selection include the following:

- **1166 Great crested newt (***T. cristatus)*

In view of the conservation objectives of the SPA, no LSE on the Sefton Coast SAC predicted as a result of the proposed platform partial decommissioning activities.

9.7 Shell Flat and Lune Deep (SAC)

An area of Annex I Sandbank habitat 15 km long located in water depths of less than 20 m. The bank comprises of sand sediments, silts, clays and coarse sands. It is the most important site in the UK for wintering common scoter.

SAC: Annex I habitats that are a primary reason for the selection of this site include sandbanks which are slightly covered by sea water all the time and reefs.

Annex I habitats that are a primary reason for selection of this site:

- **1110 Sandbanks which are slightly covered by sea water all the time**

  Shell Flat sandbank runs northeast from the southern corner of the site in a blunt crescent to the southwest. The sandbank forms a continuous structure approximately 15km long from east to west. The bank is an example of a Banner Bank, which are generally only a few kilometres in length with an elongated pear/sickle-shaped form, located in water depths less than 20m below Chart Datum (CD). Shell Flat is considered to be an excellent example of Annex I sandbank Habitat. In terms of sediment type, the bank comprises a range of mud and sand sediments from silts and clays through to coarse sands. Shell Flat is characterised by its low biodiversity, high biomass and is noted as an important foraging ground for many over wintering bird species. Surveys have identified that a large population (50,000+) of the species feed on the submerged sandbanks. This has made the Liverpool Bay area the most important site in the UK for the sea duck.

- **1170 Reefs**

In view of the conservation objectives of the SPA, no LSE on the Shell Flat and Lune Deep SAC is predicted as a result of the proposed platform partial decommissioning activities.

9.8 Fylde Offshore MCZ

Fylde MCZ is located in Liverpool Bay, approximately 3 km N from Lennox platform. The MCZ protects an area of approximately 260 km^2. The water depth to the seabed within the site ranges from the seabed almost being exposed on low tide (just 35 cm depth) to 22 metres at its deepest part.

The Fylde Offshore MCZ was designated by the Government in order to maintain the broad scale habitat “sub-tidal sand” and the habitat of conservation importance “sub-tidal sands and gravels” which are found in the area.

The subtidal sediments within the site are sand and mud. The seabed in this area is highly productive. It supports an abundance of animals such as crabs, starfish, shrimp-like crustaceans and bivalve shellfish, including the commonly found small nut-shell (*N. nitidosa*), a razor shell (P. legumen) and the white furrow shell (*A. alba*). Flatfish, including sole (*S. solea*) and plaice (*P. platessa*), are also supported by the habitat within the site.

Due to the limited area of seabed disturbance anticipated and the temporary nature of the works, in view of the conservation objectives of the SPA, no LSE on the Flyde Offshore MCZ is predicted as a result of the proposed platform partial decommissioning activities.

10.0 CONCLUSION

The development of the Project has been informed by ongoing appraisal of the environmental impacts and risks posed by options under consideration. The environmental appraisal has been based on an understanding of the baseline environment established from multiple web-based sources, scientific papers and seabed surveys.

Comprehensive identification of potential impacts from the proposed PDP was achieved through the Environmental Risk Assessment, the output of which was used to scope the requirements for further detailed impact assessment. The scoping exercise identified that there were no aspects considered to have high or medium-high impact to identified receptors. The following aspects were considered to present a medium impact to at least one receptor and required comprehensive assessment:

- Seabed disturbance

All other aspects were identified, which following implementation of mitigation measures described in this section have a low significance, are not considered to require further assessment:

- Underwater noise
- Physical presence
- Marine Discharges
- Energy use and atmospheric emissions
- Waste generation
- Unplanned events.

Due to LBA Field Area location within the network of MPAs, the further assessment includes sections on the potential impacts to integrity of the site / Conservation Objectives from the identified aspects. Cumulative effects, in-combination impacts and transboundary issues were all considered to have low significance and additional description has been provided to explain this conclusion.

The following measures will be adopted to ensure that seabed disturbance and its impacts are minimised to as low as reasonably practicable:

- Removals will be planned, managed and implemented in such a way that seabed disturbance is minimised.
- All work will be undertaken under a marine license.
- Duration of vessels in the field, particularly using DP, will be minimised as much as possible.

In order to ensure that the environmental and societal impact of the decommissioning activities remains as low as reasonably practicable, ENI will adhere to their in-house management procedures, including but not limited to contractor management, vessel inspections and audits and the legal obligation to report any accidental discharges and emissions which may occur.

Based on the findings of this EA, including the identification and subsequent application of appropriate mitigation measured and Project Management according to ENI'S HSEQ Policy and EMS, it is considered that the proposed PDP can be executed with no significant impact to the environmental or societal receptors within the UKCS or internationally.

11.0 REFERENCES

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APPENDIX A: ENVID Matrix

	LIKELIHOOD OF OCCURRENCE	0	A	B	C	D	E
	CONSEQUENCE / MAGNITUDE	Practically non-credible occurrence	Rare occurrence	Unlikely occurrence	Credible occurrence	Probable occurrence	Likely/Frequent occurrence
1	Slight effect No stakeholder impact or temporary impact on the area. Involved area < 0.1 sq mile Spill (1)< 1 m3 – no sensitive impact on ground.	L	L	L	L	L	L
2	Minor effect Some local stakeholder concern or 1 year for natural recovery or impact on small no. of not compromised species. Involved area < 1 sq mile Spill (1)< 10 m3 –impact on localised ground.	L	L	L	M	M	M
3	Local effect Regional stakeholder concern or 1-2 years for natural recovery or 1 week for clean-up or threatening to some species or impact on protected natural areas. Involved area < 10 sq miles – Spill (1)< 100 m3.	L	L	M	M-H*	H	H
4	Major effect National stakeholder concern or impact on licences or 2-5 years for natural recovery or up to 5 months for clean-up or threatening to biodiversity or impact on interesting areas for science. Involved area < 100 sq miles – Spill (1)< 1000 m3.	L	M	M-H*	H	H	H
5	Extensive effect International stakeholder concern or impact on licences / acquisitions or > 5 years for natural recovery or > 5 months for clean-up or reduction of biodiversity or impact on special conservation areas.Involved area > 100 sq miles – Spill (1)> 1000 m3.	M	M-H*	H	H	H	H

	Risk Tolerability Criteria
L	Low or 'Broadly Acceptable' Risk Region – Risk is considered to be acceptable, based on current values of society or industry best practice but requires continuous monitoring to prevent deterioration.
M M-H*	Medium and Medium-High or 'Tolerable' Risk Region – Risk can be tolerated only if the costs to reduce it are disproportionate to the benefits, according to the 'As Low As Reasonably Practicable' (ALARP) concept. A higher degree of disproportionality is to be applied for those risks falling in the Medium-High Risk Region. The ALARP assessment may be qualitative or quantitative.
H	High or 'Unacceptable' Risk Region – Risk which is not acceptable, based on current values of society or industry best practice. The activity should not be allowed to take place until sufficient control or mitigation measures have been put in place to reduce the risk to levels which are ALARP or tolerable. Issues known to give rise to a breach in legislation are by default regarded as 'Unacceptable'.