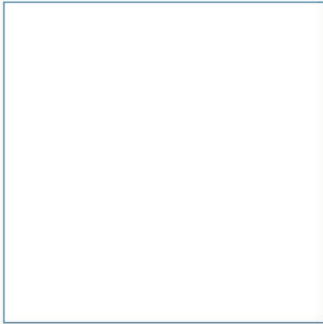
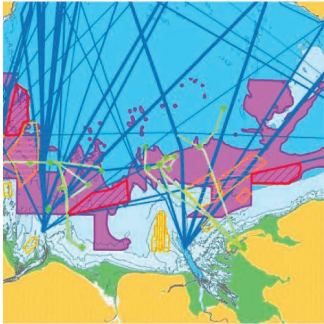
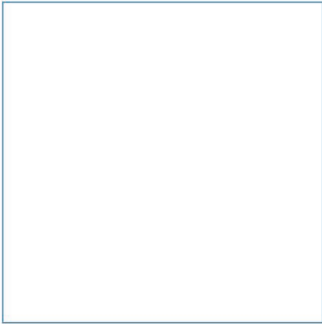
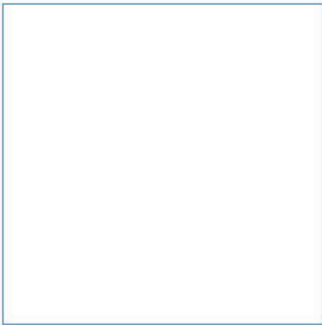


# Mersey Sand Suppliers

## Area 393 Marine Aggregate Extraction Scoping Report

Aggregate Dredging Licence Application

August 2025



Innovative Thinking - Sustainable Solutions



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# Area 393 Marine Aggregate Extraction Scoping Report


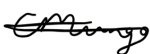

Aggregate Dredging Licence Application

August 2025



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# 1 Introduction

## 1.1 Project background

This Scoping Report has been prepared on behalf of Mersey Sand Suppliers (MSS) to initiate the marine licence application for marine aggregate extraction within Area 393<sup>1</sup> (Figure 1). MSS operate the Area and are looking to submit a marine licence to replace their existing licence with Natural Resource Wales (NRW) Marine Licencing Team (MLT) which is due to expire in December 2029.

ABPmer and Wessex Archaeology have been commissioned by MSS to produce this Scoping Report to identify the issues that will need to be addressed in detail during an Environmental Impact Assessment (EIA). The marine licence application will, therefore, need to be accompanied by an Environmental Statement (ES) that documents all of the relevant EIA information in accordance with the information detailed in Schedule 3 of the Marine Works (EIA) Regulations 2007 (as amended). This Scoping Report sets out the approach to be used in the EIA.

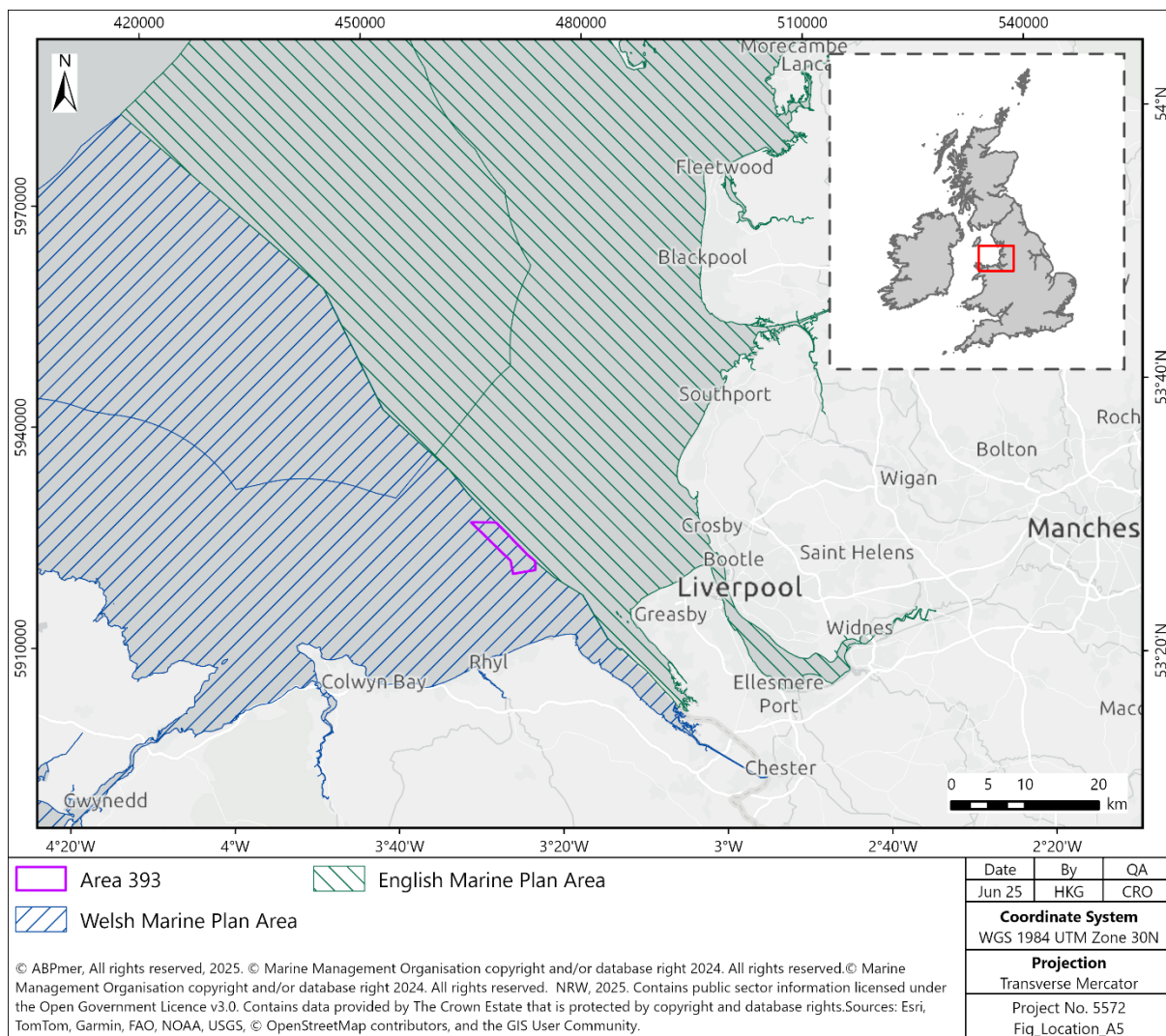


Figure 1. Location of Area 393

<sup>1</sup> Area 393 was previously referred to as 'Area 392/393, Hilbre Swash'.

It should be noted that MSS do not intend to request an ES review (i.e. submit a draft/pre-application ES). Instead, the intention is to utilise the wealth of knowledge and information accumulated over the course of previous licence term(s) along with the outcome of the Scoping Report consultations to inform an ES (with relevant appendices, including a shadow Habitats Regulations Assessment (HRA), which is to be used to support the statutory consultation phase of the licence application. Certain sections (e.g. Nature Conservation) may be submitted for informal review through advisory Discretionary Advice Services. Additionally, consultation with commercial and recreational fisheries representatives will also be held ahead of ES submission.

This report has been structured as follows:

- Section 1: Introduction:** Provides a brief project background, purpose of report and report structure;
- Section 2: Project Description:** Presents the project need and consideration of alternatives, and a description of the proposed work;
- Section 3: Legislative and Consenting Framework:** Sets out the principal consents/approvals and studies that are likely to be required;
- Section 4: Proposed EIA Methodology:** Presents the proposed content and structure of the ES and the impact assessment methodology;
- Section 5: Scoping Review:** Reviews the scope of potential impacts and further assessment work required for each of the EIA topics; and
- Section 6 Summary:** Provides a summary of the EIA topics, receptors and impact pathways that require further assessment work.

## 2 Project Description

### 2.1 Background and study area

MSS are proposing to apply for a marine licence to replace their current marine licence at Area 393. Their current licence was issued by the NRW MLT on 01 January 2014 and is due to expire in December 2029. The application will seek to continue aggregate dredging from Area 393 for another 20 years in line with The Crown Estate's production agreements periods which are being extended to 20 years upon their renewal. This will be at the same maximum annual extraction rate as is presently licensed (see Table 1). The tonnages are presented in Table 1.

**Table 1. Provisional project details for the Licence Area (tonnages will not exceed those stated)**

|  |                        |
|--|------------------------|
| Licence area                               | 22 km <sup>2</sup>     |
| Licence duration                           | 2029 – 2048 (20 years) |
| Average annual tonnage                     | 400,000 tonnes         |
| Maximum annual tonnage                     | 800,000 tonnes         |
| Maximum total extraction (20-year tonnage) | 8,000,000 tonnes       |

Area 393, Hilbre Swash, is located in Liverpool Bay, north of the Flintshire coast, approximately 12 km north of Rhyl (Figure 1). It represents an area of seabed measuring 22 km<sup>2</sup>. For British Marine Aggregate Producers Association (BMAPA) reporting purposes, Area 393 is considered part of the North West dredging region.

The seabed sediments at Area 393 are predominantly comprised of coarse sand and gravel, and fine to medium grained sand overlying glacial till and Triassic bedrock.

Over the past 15 years, all dredging within Area 393 has occurred within two Active Dredge Zones (ADZ) (TCE, 2021). Under the proposed renewed licence, it is envisaged that dredging will continue in the current ADZ for as long as possible. Once reserves are exhausted, unviable or the lowering limit reached in the current ADZ, dredging activity would move into undredged parts of the Licence Area.

#### 2.1.1 Previous (and ongoing) surveys and assessments of the Area

A marine licence to dredge Area 393 was granted (under the Marine and Coastal Access Act (MCAA), 2009) in 2014. In support of the marine licence application, an ES was produced, together with various supporting studies, including a Coastal Impact Study (CIS), and a dredging plume modelling study.

Regular monitoring surveys have been undertaken at Area 393 since dredging began, in line with conditions attached to previous and current permissions. The surveys have included benthic, bathymetric and geophysical monitoring, vibrocore and grab sampling, and benthic and seabed monitoring following the Regional Seabed Monitoring Programme (RSMP) and Regional Geophysical Monitoring Programme (RGMP) protocols.

A list of surveys undertaken since the previous ES (ERM, 2012) is provided in Table 2. Results from the first five years of surveys since the commencement of dredging under the current marine licence were summarised in the 2018 5-year substantive review for Area 393 (MarineSpace, 2018a). The latest surveys undertaken since have recently been summarised in the 2024 substantive review (ERM, 2024).

**Table 2. Surveys and assessments undertaken in/relevant to Area 393 since the ES in 2012**

| Stage                                   | Report Reference/Survey   | Author (Year)                                       |
|---|---|---|
| Environmental Statement                 | Licence Area 393 Environmental Statement including supplementary information. | ERM (2012)  |
| Baseline                                | Hilbre Swash CIS  | HR Wallingford (2011)                               |
|   | Hilbre Swash RSMP survey data (2014, 2017 and 2022)                           | APEM (2014)<br>NIRAS (2018)<br>Ocean Ecology (2022) |
| Area 393 Geophysical monitoring surveys | 2017 Regional Geophysical Monitoring Survey Report: Licence Area 393          | Bibby HydroMap (2017)                               |
|   | 2021 Regional Geophysical Monitoring Survey Report: Licence Area 393          | ABPmer (2021)                                       |
|   | 2022 Regional Geophysical Monitoring Survey Report: Licence Area 393          | A-2-Sea Solutions Ltd (2023)                        |
| Area 393 Substantive Reviews            | Area 393 Year 5 Substantive Review  | MarineSpace (2018a)                                 |
|   | Area 393 Year 10 Substantive Review   | ERM (2024)  |
| Area 393 archaeology reviews            | 2014 Pre-dredge Review  | MarineSpace (2014)                                  |
|   | 2019 Archaeology Monitoring Review  | MSDS Marine (2019)                                  |
|   | 2023 Archaeology Monitoring Review  | MSDS Marine (2023)                                  |

## 2.2 Marine aggregate dredging methods

The proposed method of extraction from Area 393 is trailer suction hopper dredging (TSHD) and anchor dredging, which have been used for the past 15-years under the existing marine licence.

Trailer suction hopper dredging is the main method used to extract marine aggregates. It entails trailing a draghead at the end of a dredge pipe (one or two at once, though typically only one) on the seabed while steaming the dredger at slow speed, typically 0.5-1.5 knots or 0.25-0.75 m/s. The draghead and dredger's pipework are connected to a powerful inboard or outboard centrifugal pump that draws sea water and sediment into the ship. During the dredging process each pass of the draghead creates a shallow furrow in the seabed. Its penetration depth depends on the nature of the seabed, dredge equipment settings and the speed of the dredger, but individual furrows are typically around 1.5 to 3 m wide and up to 0.5 m deep. Dredging can create a localised lowering of the seabed within licensed areas.

Anchor (or static) dredging involves the dredger anchoring over the deposit and deploying its dredge pipe whilst stationary. Extraction by anchor dredging typically results in deep conical depressions in the seabed.

At the beginning of the dredging process, the ship's hopper is full of water for stability (ballast). As aggregate is pumped into the hopper, as a sediment/water mix, it settles and gradually displaces the water which overflows through spillways located on the side of the vessel or weirs, back into the sea. Due to high turbulence in the hopper, a proportion of the fine sediment (e.g. fine sands, silts and clays) present in the aggregate, is also returned to the sea via the spillways or overflow weirs, forming a sediment plume.

Aggregate dredgers can load different types of cargo. Firstly, the cargo can be produced as it is dredged from the seabed, referred to as 'all in,' where all of the seabed sediment is retained. Alternatively, the cargo can be partly sorted by the dredger as it is loaded by a process known as screening.

Screening involves passing the seawater and entrained sand and gravel over a plastic or steel screen mesh, where either the gravel or sand fraction can be preferentially retained within the vessel's hopper. The rejected component is directed overboard into the water column. Screening is currently permitted at Area 393, and MSS intends for this to also continue to be included in the new licence going forward, as well as any required hopper washing. In addition, MSS is seeking consent to continue to take core and/or grab samples from the seabed within and around Area 393 for resource management and monitoring purposes.

The Applicant's dredging vessels all utilise differential GPS and sophisticated navigation plotters to ensure the vessel's Masters and watch-keeping officers are able to identify their position to an accuracy of a few metres.

## 2.3 Marine aggregate best practice mitigation

Planning, environmental assessment, licensing, and monitoring of marine aggregate dredging has evolved significantly in recent years. Along with changes to the statutory licensing regime, and advances in the scientific understanding of the impacts of aggregate dredging operations, the marine aggregate industry has also implemented voluntary good practices to mitigate and manage the effects of its operations.

In 2017, BMAPA and The Crown Estate (TCE) published a Good Practice Guidance, to summarise the procedures and measures which have been developed over the years with regard to planning, licensing, environmental assessment, monitoring, mitigation and management, in order to protect the environment and other seabed interests and to ensure the sustainability of the industry. These procedures are briefly summarised below with further detail and background on the industry provided in BMAPA and TCE (2017). While the Good Practice Guidance was developed for English waters, TCE manages the seabed around England, Wales, and Northern Ireland, and the principles are relevant to the marine aggregate industry in Wales. This Good Practice Guidance has therefore been referenced within this Scoping Report as it is considered to be applicable also in Wales.

In summary, the marine aggregates industry:

- Undertakes regular monitoring of dredging activities at individual licensed areas (on a wide variety of aspects, including, but not limited to: activities and returns, bathymetric changes, sediment and resource status, etc). Also, whilst dredging is ongoing, substantive reviews are generally undertaken every five years to summarise and review data and impacts to date;
- Produces regular sustainability and annual activity summary reports;
- Ensures that all vessels utilise an Electronic Monitoring System (EMS);
- Finances and facilitates RSMPs;
- Observes various codes of practice with regard to other users and receptors, including on archaeology, fishing and navigation; and
- Routinely follows established mitigation measures, notably:
  - retaining a layer of sediment of similar composition to that present before dredging began and an average of 0.5 m in thickness;
  - dredging in targeted active dredge areas (where applicable), and regularly publishing relevant charts of their location, in conjunction with The Crown Estate;
  - the marine aggregates industry protocol for the reporting of finds of archaeological interest; and
  - implementing exclusion zones and restrictions (e.g. around potential reefs, wrecks, and areas of thin sediment over bedrock).

Further detail on these and other measures will be provided in the ES.

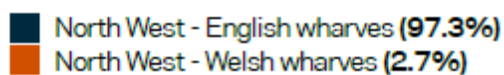
## 2.4 Project rationale

Marine aggregates are essential minerals which are widely used in concrete and other building products for the construction of homes, schools, hospitals, and infrastructure. UK Government policy and plans (HM Government, 2011) recognise that marine aggregates play a key role in servicing the nation's demand for construction aggregate and supplying materials for the maintenance of coastal and flood protection defences required for climate change adaptation. Marine aggregates also contribute to energy security and economic development through provision of fill for major coastal infrastructure projects, for example ports, renewable energy, and nuclear energy projects.

The Welsh National Marine Plan (WNMP) recognises the importance of marine aggregates for Wales and highlights the economic contribution of aggregates (Welsh Government, 2019). It is intended that Area 393 will supply sand and gravel to the construction industry and other uses such as beach replenishment for coastal protection or fill for reclamation. Area 393 has been dredged since 1991 and there is, therefore, a proven need for aggregate from the area to supply markets. Demand is not expected to decline over the next 20 years.

The majority of the North West region material is landed at wharves within the region. For example, in 2023, the majority of the dredged aggregate (97.3 % or 278,772 tonnes) was delivered to English wharves and 2.7 % (or 7,920 tonnes) was delivered to Welsh wharves (TCE, 2024).

During 2023 material extraction from the region was mainly delivered to :



Source: TCE, 2024

Image 1. The North West delivery regions and percentages for 2023

## 2.5 Consideration of alternatives

The EIA process requires the developer to consider alternatives to the proposed scheme. For this proposal, while there are relatively few available alternatives, these will be assessed as part of the EIA.

One option (the 'do nothing') is to cease dredging in Area 393 and let the remaining resource go unused. However, the dredging of marine aggregates is a well-established practice and the resources produced are delivered to some established markets where a continuity of supply is required.

Other alternative sources of aggregate include land-based sources, recycled and secondary aggregates.

All relevant alternative options will be considered further as part of the EIA process, which will include further details about economic benefits to clarify the economic rationale for the proposed activity.

## 3 Legislative and Consenting Framework

The proposed renewed marine aggregate dredging activities in Area 393 will require a range of consents and approvals under different legislative acts, supported by detailed technical and environmental investigations to inform an EIA, as well as an appraisal in relation to the Habitats Regulations. The principal consents are summarised in the following sections, although there is, in addition, a wide range of related environmental legislation with which the proposals will need to comply.

### 3.1 The Crown Estate consent

Dredging areas are held under Production Agreements between operators and TCE, which owns the seabed out to 12 nautical miles and the mineral (excluding oil and gas) rights to the limit of UK waters. Agreement will, therefore, be required from TCE to continue dredging in Area 393, should the new marine licence be granted by the NRW MLT.

### 3.2 Marine licence

The current process of marine licensing under the Marine and Coastal Access Act 2009 (MCAA) came into force on 06 April 2011 and covers the area from Mean High Water Springs (MHWS) out to 12 nautical miles. This process requires anybody wishing to undertake works below MHWS to obtain a marine licence from NRW MLT. Aggregate dredging at Area 393, therefore, requires a marine licence. The licence will cover the aggregate dredging activity that has the potential to impact the marine environment.

### 3.3 Protected habitats and species

Various species and habitats are protected from being killed, injured or disturbed under provisions of the Habitats Regulations<sup>2</sup> and Section 9(4) and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

In particular, Regulation 43 of the Habitats Regulations makes it an offence to deliberately disturb wild animals of any 'European Protected Species' in such a way as to be of likely significance:

- To impair their ability:
  - To survive, to breed or reproduce, or to rear or nurture their young; or
  - In the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- To affect significantly the local distribution or abundance of the species to which they belong.

European Protected Species include a range of marine species, namely cetaceans (i.e. dolphins, porpoises and whales).

Section 9(4) of the Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally or recklessly disturb dolphins, whales or basking sharks subject to a defence that the act was the incidental result of a lawful operation and could not reasonably have been avoided. Natural England and Countryside Council for Wales (CCW, predecessor to NRW) produced detailed guidance on the application of these provisions (Natural England and CCW, 2007).

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<sup>2</sup> These have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (HMSO, 2019).

## 3.4 Assessment requirements

### 3.4.1 Environmental Impact Assessment

The MCAA 2009 and its secondary legislation repealed the EIA and Natural Habitats (Extraction of Minerals by Marine Dredging) Regulations 2007. An EIA for Area 393 will be required in accordance with the Marine Works (EIA) Regulations 2007 (as amended) (hereafter referred to as the Marine Works EIA Regulations).

The Marine Works EIA Regulations set out the procedure that must be followed before approval is granted for a range of plans and projects. In the Marine Works EIA Regulations, these are defined in Schedules A1 and A2. Schedule A1 identifies those activities for which EIA is mandatory. The proposed work is not considered to comprise any of these activities. Schedule A2 of the Marine Works EIA Regulations identifies developments that require EIA if they exceed specified thresholds, and/or if it is deemed the development may have likely significant effects on the environment by virtue of factors such as its nature, size or location. The proposed work is considered to fall within Paragraph 10 of Schedule A2 of the Marine Works EIA Regulations, which state “*Extraction of minerals by fluvial or marine dredging*”.

An EIA is not mandatory for all Schedule A2 developments. The proposed activities are considered to require an EIA because there may be potential for the activities to result in significant effects on the environment, specifically on interest features of designated nature conservation sites (Section 5.4).

This Scoping Report has been prepared to support the formal request for an EIA Scoping Opinion from NRW MLT. It sets out the proposed approach to and scope of the information required to inform the preparation of an EIA required to support the marine licence application. Following receipt of the Scoping Opinion from NRW MLT, which will confirm the final scope of any survey requirements, supporting assessments and consultation, an ES will be prepared.

The ES will document all the relevant EIA information in accordance with the requirements detailed in Schedule 3 of the Marine Works EIA Regulations, including identification and consideration of all potential significant impacts on population, human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage, and landscape. It will also include an assessment of the interaction between these elements and identify any measures that are required to prevent, reduce or offset any significant adverse effects which may be caused by the proposed work.

### 3.4.2 Water Framework Regulations

The Water Framework Directive (WFD) (2000/60/EC) established a framework for the management and protection of Europe’s water resources. It was implemented in England and Wales through the Water Environment (WFD) (England and Wales) Regulations 2017, known as the Water Framework Regulations<sup>3</sup>. The overall objectives of the WFD as implemented by the WFD Regulations is to achieve “good ecological and good chemical status” in all inland and coastal waters by 2021 (now working towards revised objectives for 2027), unless alternative objectives are set or there are grounds for time limited derogation.

Based on the localised impacts anticipated for dredging activity at Area 393 and the location of the site, beyond the one nautical mile territorial limit applicable to the WFD (and the nearest WFD water body, the North Wales coastal water body (GB641011650000), being approximately 3 km away), it is not considered necessary to conduct a WFD compliance assessment for the Area 393.

<sup>3</sup> Following the UK leaving the EU, the main provisions of the WFD have been retained through the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukxi/2019/558/contents/made> (last accessed January 2025).

### 3.4.3 Marine Plan Conformance Assessment

In considering an application for a marine licence, NRW MLT will take into account Government policy statements and guidance, including the Marine Policy Statement (MPS) and WNMP.

A marine plan conformance assessment will be prepared to support the marine licence application for Area 393. This will review the proposed activities against the visions, objectives and policies of the WNMP. This marine plan conformance assessment will be informed by the information provided in the ES. In taking a proportionate approach to applying policies, consideration will be given to the scale, complexity and impact of the proposed work.

The assessment will be provided as an appendix to the ES

### 3.4.4 Habitats Regulations Assessment

Where a development project (or activity), such as aggregate dredging at Area 393, is located close to, or within, a European/Ramsar site, the requirements of Part 6 of the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) (the "Habitats Regulations") apply. In essence, this requires the lead Competent Authority, in this case NRW MLT, to determine whether the proposed activities/works are likely to have a significant effect on a European/Ramsar site and, if so, to undertake an Appropriate Assessment (AA) of the implications of the proposals in light of the site's conservation objectives. The AA takes account of the in-combination effects of the proposal on European/Ramsar sites in association with other relevant projects and plans.

Area 393 is located within the Liverpool Bay Special Protection Area (SPA) (see Section 5.4 for more detail). Given that the location of the proposed activity is in proximity of a European site, it is anticipated to trigger the requirement for a Habitats Regulations Assessment (HRA).

The process that needs to be followed for an HRA is clearly laid out by NRW MLT in their marine licensing advice (NRW, 2024). In simple terms, it involves two key stages. The first stage (Stage 1: Test of Likely Significant Effect (LSE)) determines if the proposed work has the potential to result in an LSE on a European/Ramsar site and if there is a need to progress to the next stage of the HRA. Stage 2 (Appropriate Assessment), if required, provides the evidence required to confirm whether the proposed work has the potential to result in an adverse effect on integrity (AEOI) on any European/Ramsar site either alone or in-combination with other plans and projects. Unless the conclusion is that there will be no adverse impact, the applicant will have to consider measures to mitigate any adverse effects. If appropriate and adequate mitigation measures are not possible, the project may only be consented if there is no alternative approach, there are reasons of overriding public interest for it to proceed, and a suitable compensation package has been agreed. The information contained in the HRA will enable the Competent Authority to undertake an AA, assessing the effects of the proposed work on the features for which the sites are designated.

The HRA will be provided as an appendix to the ES.

### 3.4.5 Marine Conservation Zones

The MCAA 2009 facilitates the establishment of an ecologically coherent network of Marine Protected Areas (MPAs). The Act established a new type of MPA called a Marine Conservation Zone (MCZ) to protect nationally important marine wildlife, habitats, geology and geomorphology.

Area 393 is located 20.3 km from the Fylde MCZ which is designated for subtidal sand and subtidal mud. Given this distance and that the protected features are habitats (i.e., non-mobile), a formal MCZ assessment is not considered to be required.

## 3.5 Policy context

In considering an application for a marine licence, NRW MLT will take into account UK policy statements and guidance. The following sections provide an overview of the key planning context applicable to the continued aggregate dredging proposed at Area 393 and identify some of the policy considerations that will be material to the decision-making process. The ES will present a more detailed review of the national and local policy context of the proposed aggregate dredging.

### 3.5.1 Marine Policy Statement

The MPS (HM Government, 2011) provides a framework for the development of marine plans. It is the role of marine plans to set out how the MPS will be implemented in specific areas, providing detailed policy and spatial guidance and help to ensure that decisions within an area contribute to the delivery of UK, national and any area specific policy objectives.

The UK vision for the marine environment is identified as being "*clean, healthy, safe, productive and biologically diverse oceans and seas*" (paragraph 2.1.1 of the MPS). High level marine objectives which reflect the principles for sustainable development and contribute to the delivery of this vision are provided within the MPS.

In terms of decision making, the MPS explains at a high level that the decision maker should make authorisation decisions in accordance with the relevant marine policy documents unless relevant considerations indicate otherwise.

### 3.5.2 Welsh National Marine Plan

Area 393 is within the area covered by the WNMP published in November 2019 by the Welsh Government (Welsh Government, 2019). Policies are presented within an economic, social and environmental framework, helping to support the high-level objectives set out in the UK Marine Policy Statement, as well as sustainable development of the marine area.

The role of Marine Plan is to set out how the MPS will be implemented in specific areas, providing detailed policy and spatial guidance and to help ensure that decisions within an area contribute to the delivery of UK, national and any area specific policy objectives. The vision of the WNMP is:

*"Welsh Seas are clean, healthy, safe, productive and biologically diverse:*

- *Through an ecosystem approach, natural resources are sustainably managed, and our seas are healthy and resilient, supporting a sustainable and thriving economy;*
- *Through access to, understanding of and enjoyment of the marine environment and maritime cultural heritage, health and well-being are improving;*
- *Through Blue Growth more jobs and wealth are being created and are helping coastal communities become more resilient, prosperous and equitable with a vibrant culture; and*
- *Through the responsible deployment of low carbon technologies, the Welsh marine area is making a strong contribution to energy security and climate change emissions targets."*

In order to deliver the marine plan vision and support sustainable development, 13 objectives have been defined. The following objective related to aggregates:

*“Objective 1 - To continue to use marine aggregates resources at a rate and in locations which best meet our current and future needs by ensuring adequate reserves are provided for through long-term licences” (paragraph 253).*

Under this objective, there are three particular marine plan policies of direct relevance to aggregate dredging at Area 393:

- Policy AGG\_01 a/b recognises that proposals for new aggregate extraction will be supported where they contribute to the objective of a plan. Proposals should comply with the relevant general policies and sector safeguarding policies of the plan and any other relevant considerations. Relevant public authorities and the sector are encouraged, in liaison with other interested parties, to explore opportunities for the sustainable use for marine aggregate resources, define and refine Strategic Resource Areas and support the sustainable development of the sector through marine planning.
- Policy SAF\_01 recognises that proposals that may affect safeguarded areas must demonstrate that they will not compromise the ability of the safeguarded sector to operate effectively. If a proposal could impact a safeguarded area it must justify the need for its location, show that alternatives have been considered and how impacts will be mitigated.
- Policy SAF\_02 recognises that any proposal that may significantly impact the potential use of a Strategic Resource Area must demonstrate compatibility with that future use, or if compatibility cannot be demonstrated, provide a clear and convincing case for proceeding. Proposals should avoid significant adverse impacts, or if avoidance is not possible, then impacts should be minimised, or if minimisation is not possible then impacts should be mitigated.

These WNMP sector policies set out the Welsh Government’s strategic level policy in relation to the extraction of marine sand and gravel for aggregates from Welsh waters. The WNMP recognises that *“marine aggregates play a strategically important role in the national and local supply of aggregates predominantly for use in construction projects” (paragraph 255).*

### 3.5.3 UK Marine Strategy Regulations

The UK Marine Strategy Regulations 2010 were transposed from the European (EU) Marine Strategy Framework Directive (MSFD). These require the UK to take the necessary measures to achieve or maintain Good Environmental Status (GES) by 2020 through the development of a UK Marine Strategy. In 2012, the UK produced ‘Part One of the Marine Strategy’, which defines criteria and targets for each descriptor and provides an assessment of the status of GES. In 2014, ‘Part Two’, which focuses on a co-ordinated monitoring programme for the ongoing assessment of GES, was published. ‘Part Three’ outlines a programme of measures that will contribute to the achievement and maintenance of GES, and was published in 2015.

An updated Part One was published in 2019, to summarise progress towards achieving GES, and to set out how the four devolved administrations of the UK intend to move towards GES of UK seas over the next six years. An updated Part Two was published in 2014 which provides updated monitoring programmes. An updated Part Three was published in 2025 which provides an updated programme of measures and an assessment of the status of GES.

There are 11 descriptors of GES, including seafloor integrity, biological diversity and underwater noise. GES is assessed at the level of the European Marine Regions, of which there are two covering UK waters. The pressures exerted on the marine environment by dredging will, therefore, be a small contribution in the context of UK Marine Regions and unlikely to be a significant issue.

### 3.5.4 Environment (Wales) Act

Proposals in Wales need to demonstrate consistency with policies of the Environment (Wales) Act (2016). The Environment (Wales) Act puts in place a legislative framework to promote the Sustainable Management of Natural Resources in Wales. The Natural Resources Policy, developed under the Environment (Wales) Act, sets out that the WNMP will guide the way in which Welsh Government will take forward the delivery of Natural Resources Policy priorities in the marine environment as a part of its approach to the management of Wales' marine natural resources. Section 7 of Part 1 of the Act (Biodiversity lists and duty to take steps to maintain and enhance biodiversity) replaces the duty in Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006.

### 3.5.5 Well-being and Future Generations (Wales) Act

The Well-being of Future Generations (Wales) Act is concerned with improving the social, economic, environmental and cultural well-being of Wales. It requires public bodies to consider the long-term issues, work better with people and communities and each other, look to prevent problems and take a more joined-up approach. To help public bodies achieve the same vision, the Well-being of Future Generations (Wales) Act puts in place seven well-being goals.

The proposed development is considered to be consistent with the goals of the Well-being of Future Generations (Wales) Act, in particular in supporting 'A Resilient Wales' "*A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change*".

## 4 Proposed EIA Methodology

### 4.1 Further assessment content and structure

An EIA of the proposed activity will be undertaken and documented in an ES. The ES will include the requirements outlined in Schedule 3 of the Marine Works EIA Regulations as set out in Table 3.

**Table 3. ES requirements according to the Marine Works (EIA) Regulations (Schedule 3)**

| Schedule Reference | Requirement for ES   |
|--------------------|--|
| 1                  | A description of the project, including in particular:   |
|                    | a) A description of the location of the development.   |
|                    | b) A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases.  |
|                    | c) A description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used.  |
|                    | d) An estimate, by type and quantity, of expected residues and emissions such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.   |
| 2                  | A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.             |
| 3                  | A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge. |
| 4                  | a) A description of the factors specified in regulation 4(2) (of the Town and Country Planning EIA Regulations) and 21A(2)(a) (of the Marine Works EIA Regulations) likely to be significantly affected by the development:  |
|                    | b) Population, human health;   |
|                    | c) Biodiversity (for example fauna and flora);   |
|                    | d) Land (for example land take), soil (for example organic matter, erosion, compaction, sealing);  |
|                    | e) Water (for example hydromorphological changes, quantity and quality);   |
|                    | f) Air, climate (for example greenhouse gas emissions, impacts relevant to adaptation);  |
|                    | g) Material assets;  |
|                    | h) Cultural heritage, including architectural and archaeological aspects; and  |
|                    | i) Landscape.  |

| Schedule Reference | Requirement for ES   |
|--------------------|--|
| 5                  | A description of the likely significant effects of the development on the environment resulting from, inter alia: <ol style="list-style-type: none"> <li>The construction and existence of the development, including, where relevant, demolition works;</li> <li>The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;</li> <li>The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;</li> <li>The risks to human health, cultural heritage or the environment (for example due to accidents or disasters);</li> <li>The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;</li> <li>The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;</li> <li>The technologies and the substances used.</li> </ol> |
| 6                  | The description of the likely significant effects should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.  |
| 7                  | A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved   |
| 8                  | A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.  |
| 9                  | A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.   |
| 10                 | A non-technical summary of the information provided under paragraphs 1 to 8/9.   |
| 11                 | A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.  |

## 4.2 Impact assessment methodology

To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard assessment methodology will be applied where possible. This methodology has been developed from a range of sources, including the Marine Works EIA Regulations, the EIA Directive (2014/52/EU), statutory guidance, consultations and ABPmer's previous (extensive) EIA project experience and is explained in the following sections. ABPmer has an Institute of Environmental Management and Assessment (IEMA) Quality Mark, demonstrating their commitment to excellence in leading the co-ordination of statutory EIAs in the UK. The ES will also follow the principles of relevant guidance, including the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for ecological impact assessment in the UK and Ireland (which consolidate advice for terrestrial, freshwater and coastal environments) (CIEEM, 2018) and IEMA guidelines (IEMA, 2016).

The effect of the proposed activity on each of the environmental receptors will be assessed by describing in turn: the baseline environmental conditions of each receiving environment; the 'impact pathways' by which the receptors could be affected; the significance of the impacts occurring; and the measures to mitigate for significant adverse impacts where these are predicted.

This impact assessment methodology, which is presented in the following sections, is designed to incorporate the key criteria and considerations without being overly prescriptive.

#### 4.2.1 Stage 1 – Identify receptors and changes

The first stage identifies the potential environmental changes resulting from the proposed activity and the features of interest (receptors) that are likely to be affected (which are together referred to as the impact pathway). The potential impact pathways which are considered relevant to this EIA will be set out within each topic-specific assessment chapter.

#### 4.2.2 Stage 2 – Understand change and sensitivity

The second stage involves understanding the nature of the environmental changes to provide a benchmark against which the changes and levels of exposure can be compared. The scale of the impacts via the impact pathways depends upon a range of factors, including the following:

- Magnitude (local/strategic);
  - Spatial extent (small/large scale);
  - Duration (temporary/short/intermediate/long-term);
  - Frequency (routine/intermittent/occasional/rare); and
  - Reversibility.
- Probability of occurrence;
- The margins by which set values are exceeded (e.g. water quality standards);
- The baseline conditions of the system;
- Existing long-term trends and natural variability;
- The sensitivity of the receptor (resistance/adaptability/recoverability);
- The importance of the receptor (e.g. designated habitats and protected species); and
- Confidence, or certainty, in the impact prediction.

#### 4.2.3 Stage 3 – Impact assessment

To assess the significance of effects, the magnitude of the impact pathway and the probability of it occurring is evaluated to understand the exposure to change, and this is assessed against the sensitivity of a receptor/feature to understand its vulnerability. Finally, this is compared against the importance of a receptor/feature to generate a level of significance for effects resulting from each impact pathway. This is summarised in the following sections.

The key significance levels for either beneficial or adverse impacts are described as follows:

1. Insignificant: Change not having a discernible effect;
2. Minor: Change is discernible but tolerable and not significant;
3. Moderate: Change is significant and if adverse, is likely to require mitigation; and
4. Major: Change is highest in magnitude, and the receptor has a high vulnerability and importance. Change is significant and if adverse, will require mitigation.

To ensure transparency in the impact assessment, it is important to make clear the evidence-based or value-based judgments used at each stage of the assessment, and how they have been attributed to a level of significance. This will be presented in the impact assessment for each impact pathway.

### Impact assessment guidance tables

The matrices in Table 4 to Table 6 will be used to help assess significance (see below).

Table 4 will be used as a means of generating an estimate of exposure to change for each impact pathway. Magnitude of change needs to be considered in spatial and temporal terms (including duration, frequency and seasonality), and against the background environmental conditions in a study area.

Once a magnitude has been assessed, this should be combined with the probability of occurrence to arrive at an exposure score which can then be used for the next step of the assessment, which is detailed in Table 5. For example, an impact pathway with a medium magnitude of change and a high probability of occurrence would result in a medium exposure to change.

**Table 4. Exposure to change, combining magnitude and probability of change.**

| Probability of Occurrence | Magnitude of Change |            |            |            |
|---------------------------|---------------------|------------|------------|------------|
|                           | Large               | Medium     | Small      | Negligible |
| High                      | High                | Medium     | Low        | Negligible |
| Medium                    | Medium              | Medium     | Low        | Negligible |
| Low                       | Low                 | Low        | Negligible | Negligible |
| Negligible                | Negligible          | Negligible | Negligible | Negligible |

Table 5 will then be used to score the vulnerability of the features/receptors of interest based on the sensitivity of those features and their exposure to a given change. Where the exposure and sensitivity characteristics overlap then vulnerability exists, and an adverse effect may occur. For example, if the impact pathway previously assessed with a medium exposure to change acted on a receptor which had a high sensitivity, this would result in an assessment of high vulnerability. Sensitivity can be described as the intolerance of a habitat, community or individual of a species to an environmental change and essentially considers the response characteristic of the feature.

Thus, if a single or combination of environmental changes is likely to elicit a response then the feature under assessment can be considered to be sensitive. Where an exposure or change occurs for which the receptor is not sensitive, then no vulnerability can occur. Similarly, vulnerability will always be 'none' no matter how sensitive the feature is, if the exposure to change had been assessed as 'negligible'.

**Table 5. Estimation of vulnerability based on sensitivity and exposure to change.**

| Sensitivity of Feature | Exposure to Change |          |          |            |
|------------------------|--------------------|----------|----------|------------|
|                        | Large              | Medium   | Small    | Negligible |
| High                   | High               | High     | Moderate | None       |
| Moderate               | High               | Moderate | Low      | None       |
| Low                    | Moderate           | Low      | Low      | None       |
| None                   | None               | None     | None     | None       |

The vulnerability will then be combined with the importance of the feature of interest using Table 6 to generate an initial level of significance. The importance of a feature is based on its value and rarity (e.g. to either ecosystem or economy), such as the levels of protection, whilst recognising that importance should be determined having regard to geographic context (i.e. international/European, national, regional, and local). For an example of estimating significance, if a high vulnerability was previously given to a feature of low importance, an initial level of significance of minor would be given.

**Table 6. Estimation of significance based on vulnerability and importance**

| Importance of Feature | Vulnerability of Feature to Impact |               |               |               |
|-----------------------|------------------------------------|---------------|---------------|---------------|
|                       | High                               | Moderate      | Low           | None          |
| High                  | Major                              | Moderate      | Minor         | Insignificant |
| Moderate              | Moderate                           | Moderate      | Minor         | Insignificant |
| Low                   | Minor                              | Minor         | Insignificant | Insignificant |
| None                  | Insignificant                      | Insignificant | Insignificant | Insignificant |

#### 4.2.4 Stage 4 – Impact management (mitigation)

The final stage is to identify any impacts that are found to be significant (i.e. moderate and/or major adverse) and require mitigation measures to reduce residual impacts, as far as possible, to environmentally acceptable levels. Mitigation measures considered throughout the EIA process can take three forms (IEMA, 2016):

- Primary (inherent) – modifications to the location or design of the development made during the pre-application phase that are an inherent (or embedded) part of the project. These are captured and taken account of in the initial impact assessment (Section 4.2.3);
- Secondary (foreseeable) – actions that will require further activity in order to achieve the anticipated outcome (identified as necessary through the assessment process). Within the impact assessment process, the use of secondary mitigation measures will alter the risk of exposure and, hence, will require significance to be re-assessed and thus the residual impact (i.e. with mitigation) identified; and
- Tertiary (inexorable) – actions that would occur with or without input from an environmental impact assessment process, including actions that will be undertaken to meet other existing legislative requirements, or actions considered to be standard practices to manage commonly occurring environmental effects. These are captured and taken account of in the initial impact assessment (Section 4.2.3).

In addition, it is appropriate to adopt a mitigation hierarchy which, from the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) guidance on ecological impact assessment specifically, can be summarised as follows:

- Seek to adopt options that avoid harm in the first instance;
- Identify ways to minimise adverse effects that cannot be completely avoided;
- Undertake compensation where there are significant residual adverse effects despite the mitigation proposed; and
- Provide net benefits (for biodiversity) above requirements for avoidance, mitigation or compensation.

In instances, a decision may need to be taken despite residual uncertainty about the effects. In such cases, adaptive management, linked to a bespoke monitoring programme, is a well-established and recommended way of ensuring that any negative impacts or effects are addressed in the course of the development and during the subsequent operational phase.

### 4.2.5 Confidence assessment

Following the significance assessment, a confidence assessment will be undertaken which recognises the degree of interpretation and expert judgement applied. This will be presented in the summary table contained within the conclusions section of each impact assessment section. Confidence will be assessed on a scale incorporating three values: low, medium and high.

### 4.2.6 Cumulative impact and in-combination assessment

Under the Marine Works EIA Regulations, it is necessary to assess the potential cumulative impacts of a proposed activity on all environmental receptors together with other existing or consented developments in the area. Under the Habitats Regulations<sup>4</sup>, it is also necessary to consider the in-combination effects of a development proposal specifically on the interest features of European/Ramsar sites.

The cumulative (and in-combination) assessment will consider the effects of the proposed activity alongside those arising from other plans, projects, and activities. Cumulative impacts result from the combined impacts of multiple developments or from the combined effect of individual impacts (e.g. where different project elements in different locations have a cumulative impact on a particular feature). The impacts resulting from a single scheme or activity may not be significant on their own but when combined with impacts resulting from other schemes, these could become significant.

The cumulative and in-combination assessment will be presented in a separate ES chapter. The assessment of cumulative impacts will involve a desk-based review of relevant marine licence applications within close proximity of the proposed activity. Further consultation with NRW MLT will also be undertaken to understand any other plans, projects or activities which may have the potential for cumulative effects with the proposed activity. Section 5.10 below provides more detail on how this chapter is proposed to be completed.

## 4.3 Consultation

Consultation is a crucial part of the assessment process. During the scoping phase of the application, formal consultation will be led by NRW MLT to seek views of statutory consultees and any other non-statutory consultees that NRW MLT consider may be impacted by the proposed activity.

Consultation with relevant stakeholders will be carried out to obtain baseline information and further advice on the environmental assessments (e.g., assessment approach) in support of the applications for the proposed activity, where required.

## 4.4 Study area

The scope of the study area to be considered will be defined on the basis of the maximum extent of the proposed activity. It will also take into account the spatial and temporal extent (zone of influence) of the likely significant effects and their importance in a geographical context that could arise from the proposed activity and the sensitivities of the relevant topics/receptors on an individual basis. Areas outside the range of any potential impacts are representative of the wider natural environment and form part of the wider study area.

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<sup>4</sup> These have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukxi/2019/579/made> (Accessed December 2022).

For marine aggregates impact assessments, impact zones are typically identified on the basis of modelling studies and insights from observational studies. Two impact zones are commonly referred to in the aggregates industry impact assessment literature: primary and secondary impact zones.

The Primary Impact Zone (PIZ) refers to the maximum future dredging footprint (i.e. the area where dredging could occur over the course of a licence). Secondary Impact Zones (SIZs) refer to the local zone(s) where effects that extend beyond the immediate footprint of dredging may occur. Two SIZs will be utilised for most receptors in the EIA, notably one for plume impacts, and one related to sediment dispersion; these will be based on the plume modelling studies undertaken by HR Wallingford (2011) for Area 393, which are still considered applicable, along with supporting empirical/observed evidence.

Where appropriate/necessary, other impact zones will be applied in the individual receptor chapters of the ES.

## 5 Scoping Review

### 5.1 Key receptors/topics to be considered

Based on the nature of the proposals for aggregate extraction at Area 393 and existing knowledge of the baseline conditions within the study area, the following eight EIA topics or receptor groups (as listed below), as well as cumulative and in-combination effects, are potentially relevant to the EIA:

- Physical processes (including coastline, geology, hydrodynamics, seabed characteristics and turbidity);
- Water and sediment quality;
- Nature conservation and marine ecology:
  - Benthic habitats and species;
  - Fish and shellfish ecology;
  - Marine and coastal ornithology;
  - Marine mammals and turtles;
- Commercial and recreational fisheries;
- Commercial and recreational navigation;
- Cultural heritage;
- Coastal protection and flood defence; and
- Infrastructure and other marine users.

A number of topics/receptors are proposed to be scoped out of the EIA. The rationale for not undertaking further assessment is presented in Table 7.

**Table 7. Topics or receptors scoped out of the EIA.**

| Scoped out Topic or Receptor | Justification  |
|------------------------------|--|
| Airborne noise and vibration | Given the distance from the nearest sensitive receptors (Area 393 is approximately 12 km from the coast and nearest settlement), and the existing level of aggregate extraction in the area, it has been concluded that there is no impact pathway for humans to be disturbed by noise. The effects of noise and vibration from dredging activity on ecological receptors will be considered in the EIA, see Section 5.4.                            |
| Air quality                  | Given the distance from the coast (approximately 12 km), it has been concluded that there is no impact pathway for on-land air quality to be significantly affected by marine aggregates extraction at Area 393. Carbon footprint will be discussed in the ES; it is proposed that this is included in Section 3 of the ES (which will cover 'Project Description and Methodology').   |
| Human health                 | Given the distance from the nearest sensitive receptors (Area 393 is approximately 12 km from Rhyl) and the existing level of aggregate extraction in the area, it has been concluded that there is no impact pathway for human health to be affected by extraction at Area 393. Carbon footprint will be assessed in the EIA; it is proposed that this is included in Section 3 of the ES (which will cover 'Project Description and Methodology'). |

| Scoped out Topic or Receptor         | Justification   |
|--------------------------------------|---|
| Landscape/seascape and visual impact | Dredging operations have been ongoing for more than 30 years at Area 393. Therefore, there will be no change to sea/landscape character or visual appearance due to the continuation of aggregate extraction within the Area 393. This topic is, therefore, proposed to be scoped out of the EIA.   |
| Light                                | Given the distance from sensitive receptors and the existing level of aggregate extraction in the area, there will be no significant lighting effects resulting from the dredger activity. Therefore, this topic is proposed to be scoped out of the EIA. The effects of lighting from dredging activity on ecological receptors will, where applicable, be considered in the EIA, see Section 5.4. |
| Terrestrial ecology                  | The proposed aggregate dredging will all take place below Mean High Water Springs (MHWS) and within the offshore marine environment. Therefore, there will be no potential effect on terrestrial ecology features and this topic is proposed to be scoped out of the EIA.   |

## 5.2 Physical processes

This section sets out the proposed scope of the ES chapter that will report the findings of the physical processes assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.2.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on physical processes will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation and guidance, including:

- MCAA;
- The Conservation of Habitats and Species Regulations 2017;
- The Water Framework Regulations 2017;
- The Waste (England and Wales) Regulations 2011;
- UK MPS (HM Government, 2011);
- WNMP (Welsh Government, 2019);
- Environment (Wales) Act 2016;
- Well-being of Future Generations (Wales) Act 2015;
- UK Marine Strategy;
- British Marine Aggregate Producers Association (BMAPA) 'Marine Aggregate Dredging and the Coastline: A Guidance Note' (BMAPA 2013);
- BMAPA and TCE's 'Good Practice Guidance: Extraction by Dredging of Aggregates from England's Seabed' (BMAPA and TCE, 2017); and
- Relevant local policy.

### 5.2.2 Description of the existing environment

The following sub-sections summarise the baseline characterisation of the physical processes of the study area, largely derived from the following studies:

- The various RGMP surveys listed in Section 2.1.1;
- The Area 392/393 Hibre Swash CIS (HR Wallingford, 2011); and
- Other existing reports related to relevant local processes, e.g. Shoreline Management Plan (SMP) documents (Environment Agency, 2025).

### Coastal characterisation

The areas of coast relevant to the Area 393 assessment include the North Wales, Cheshire, Merseyside and Lancashire coastlines. These are predominantly sandy, low-lying areas with occasional rocky islands such as Hilbre at the mouth of the Dee and low lying sandstone cliffs such as found inshore of Hoylake.

### Geology and bathymetry

The geology of the seabed across the southern Irish Sea consists of Palaeozoic rocks in the west and Mesozoic rocks, mostly Permian and Triassic sandstones and mudstones, in the east. Quaternary sediments consisting of glacial till of Devensian age together with fluvial sediments associated with regional deglaciation overlay these rocks. Superficial seabed sediments of Holocene age exist locally, mainly as veneers over bedrock and Quaternary sediments (ERM, 2012).

Area 393 lies on a relatively flat expanse of seabed in Liverpool Bay although close to and within the site a variable small-scale surface relief exists, due to fields of megaripples with northeast to southwest trending crests (Figure 2). In addition, dredged depressions from previous sand extraction form an undulating seabed with a relief of typically 6 to 7 m, mainly in the southeast of the current active dredge zone.

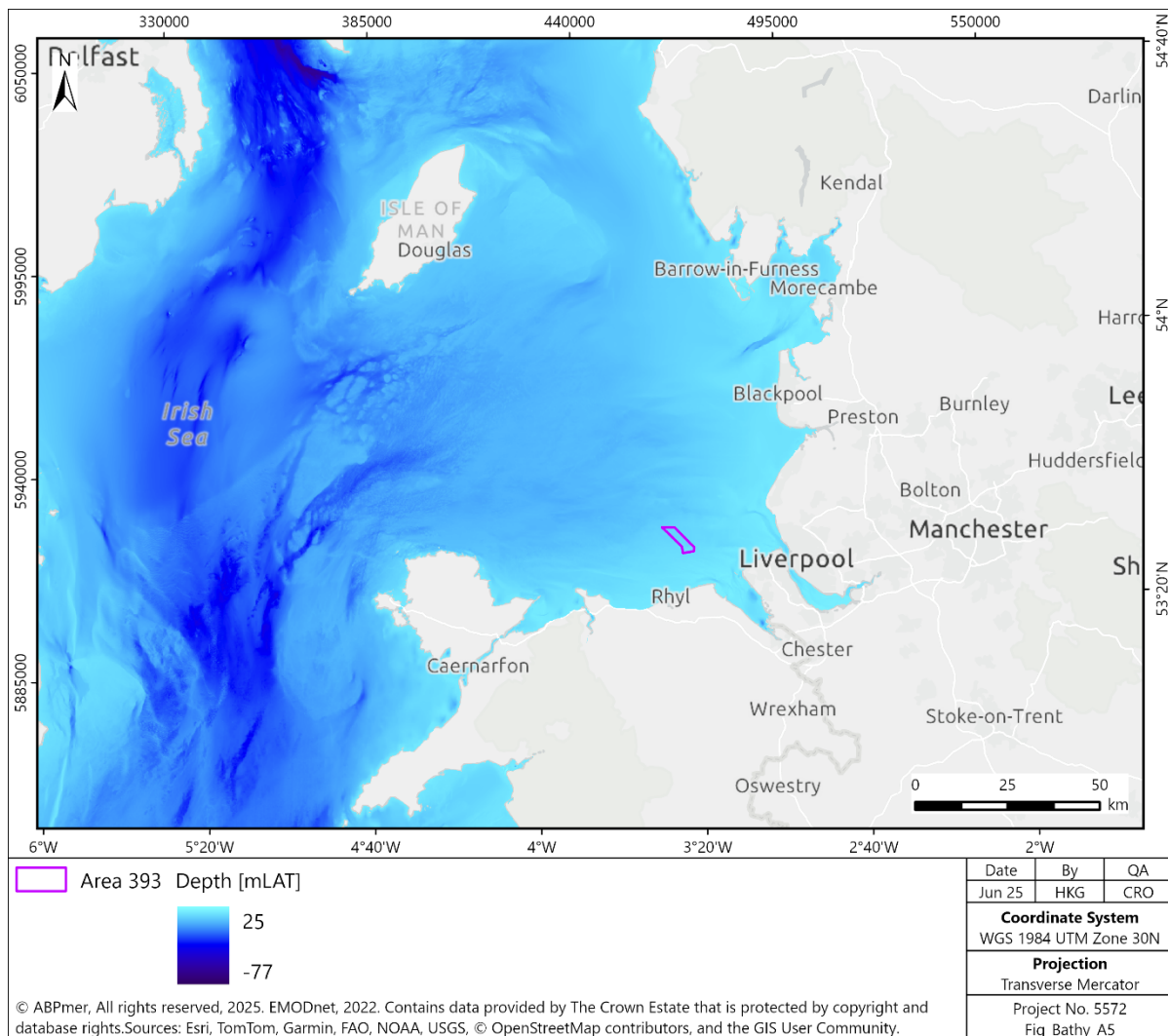
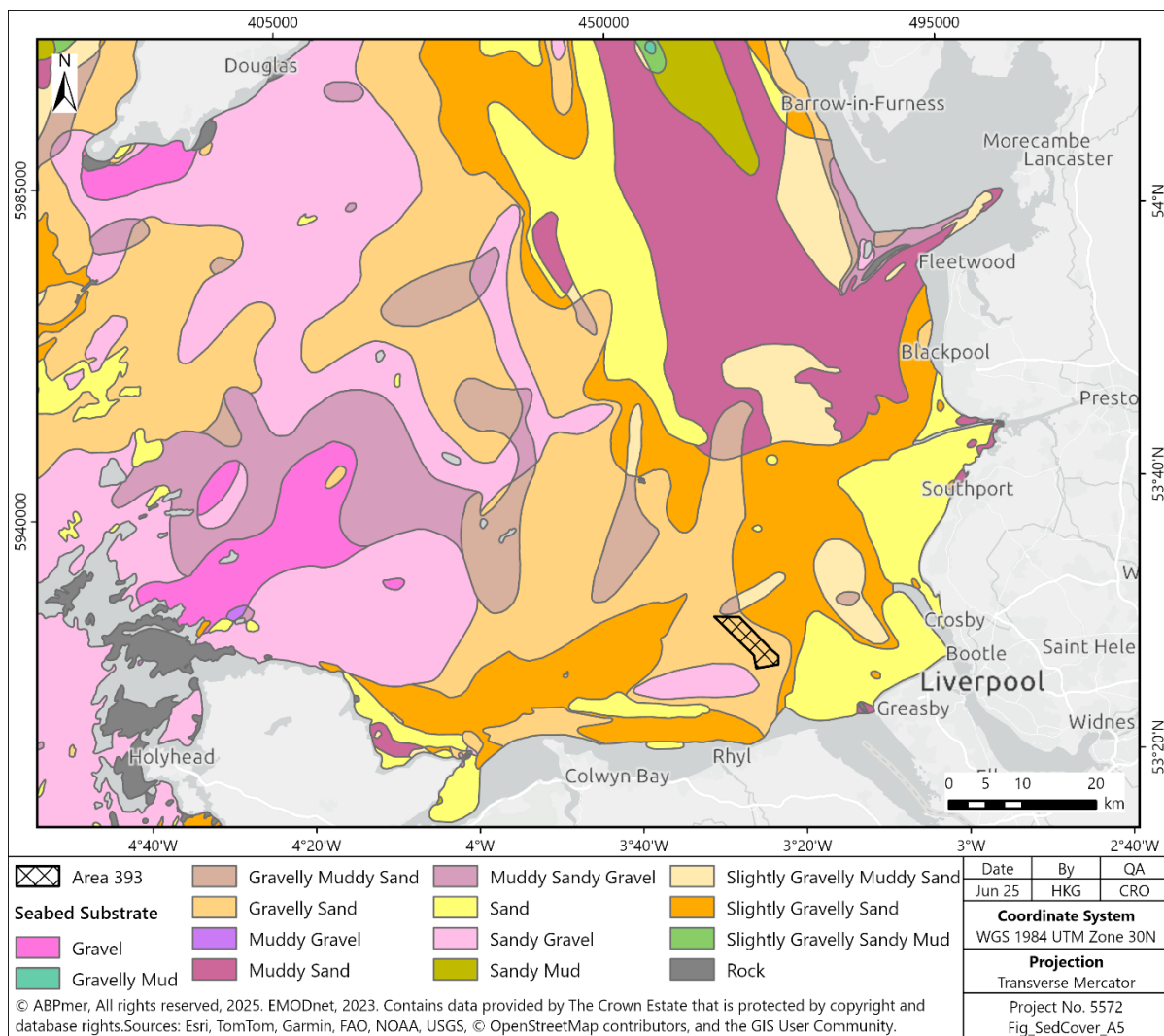


Figure 2. Regional bathymetry at Area 393

### Seabed sediments

Within the Licence Area, the surface seabed sediments are made up of coarse sand and gravel and fine to medium grained sand overlying glacial till and Triassic bedrock. Seismic survey data suggests that the sand deposits within Area 393 lie within the now submerged offshore extension of the valley of the ancestral River Dee, which existed after the last glaciation but before Liverpool Bay was submerged by rising sea levels (HR Wallingford, 2011).

The western margin of the former river valley crosses the application site and in this area, sediments reach 10 to 12 m thick. The valley has been completely infilled by fluvial processes and these sediments are now relict and immobile. The sand and gravel valley infill is of a different character to the beach sediments of nearby coastlines (HR Wallingford, 2011). Broad-scale seabed sediment mapping across Area 393 is provided in Figure 3.



Note: Figure shows licence areas and tender areas and extents may differ from the 'active dredge areas' shown on Figure 1

Source: EMODnet, 2016

Figure 3. Broad-scale seabed sediment cover across the wider study area.

### Hydrodynamic regime

The following sections describe the existing (baseline) characteristics of the study area, in relation to water levels, flows and waves.

## Water levels

The characteristic tidal levels for Hilbre Island, Mostyn and Llandudno are listed in Table 8. This shows macrotidal ranges along the frontage of 7.2 to 7.8 m for a mean spring tide, with corresponding MHWS elevations between 7.7 and 9.0 mCD, and Mean High Water Neap (MHWN) levels between 5.9 and 7.2 mCD.

**Table 8. Astronomic tidal levels across the study area**

| Level                            | Hilbre Island |       | Mostyn |      | Llandudno |       |
|----------------------------------|---------------|-------|--------|------|-----------|-------|
|                                  | mCD           | mODN  | mCD    | mODN | mCD       | mODN  |
| Highest Astronomic Tide (HAT)    | 10.2          | 5.27  | 9.8    | 5.3  | 8.6       | 4.75  |
| Mean High Water Spring (MHWS)    | 9.0           | 4.07  | 8.9    | 4.4  | 7.7       | 3.85  |
| Mean High Water Neap (MHWN)      | 7.2           | 2.27  | 7      | 2.5  | 5.9       | 2.05  |
| Mean Sea Level (MSL)             | 5.15          | 0.22  | 4.9    | 0.4  | 4.06      | 0.21  |
| Mean Low Water Neap (MLWN)       | 3.1           | -1.83 | 2.9    | -1.6 | 2.3       | -1.55 |
| Mean Low Water Spring (MLWS)     | 1.3           | -3.63 | 1.1    | -3.4 | 0.5       | -3.35 |
| Lowest Astronomic Tide (LAT)     | 0.1           | -4.83 | 0.2    | -4.3 | -0.4      | -4.25 |
| Astronomic Tidal Range (HAT-LAT) | 10.1          |       | 9.6    |      | 9.0       |       |
| Spring Range (MHWS-MLWS)         | 7.7           |       | 7.8    |      | 7.2       |       |
| Neap Range (MHWN-MLWN)           | 4.1           |       | 4.1    |      | 3.6       |       |

Source: UKHO Tide Table, 2025

## Extreme levels and relative sea level rise

Table 9 provides the extreme (total) sea level, for a range of return periods, within southern Liverpool Bay based upon the skew surge joint probability statistical analysis of the regional tide gauge data (Environment Agency, 2018). Comparison of Table 8 and Table 9 clearly indicates that a typical 1 in 1-year extreme sea level at the site (5.10 mODN) is slightly below that of HAT at Mostyn (5.3 mODN), indicating that surges (both positive and negative) can play an important role in water levels along this section of coastline.

**Table 9. Extreme Sea Levels for southern Liverpool Bay**

| Site   | Return Period Levels (mODN) |      |      |      |      |      |      |      |      |      |
|--|-----------------------------|------|------|------|------|------|------|------|------|------|
|  | 1                           | 2    | 5    | 10   | 20   | 25   | 50   | 100  | 200  | 500  |
| Dee Estuary entrance<br>(CFBD chainage_1148) | 5.10                        | 5.23 | 5.33 | 5.42 | 5.51 | 5.54 | 5.66 | 5.72 | 5.81 | 5.93 |

Source: Environment Agency, 2018

UK Climate Projections guidance 2018 (UKCP18) on relative sea-level rise along the southern Liverpool Bay coastline is provided in Table 10.

**Table 10. UKCP18 sea level rise projections for southern Liverpool Bay**

| Year | Projected Sea Level Rise (m) Under Range of Percentile Values |         |         |
|------|---|---------|---------|
|      | 5 %ile  | 50 %ile | 95 %ile |
| 2025 | -   | -       | -       |
| 2040 | 0.05  | 0.08    | 0.11    |
| 2060 | 0.14  | 0.21    | 0.32    |
| 2080 | 0.25  | 0.38    | 0.59    |
| 2100 | 0.36  | 0.58    | 0.90    |

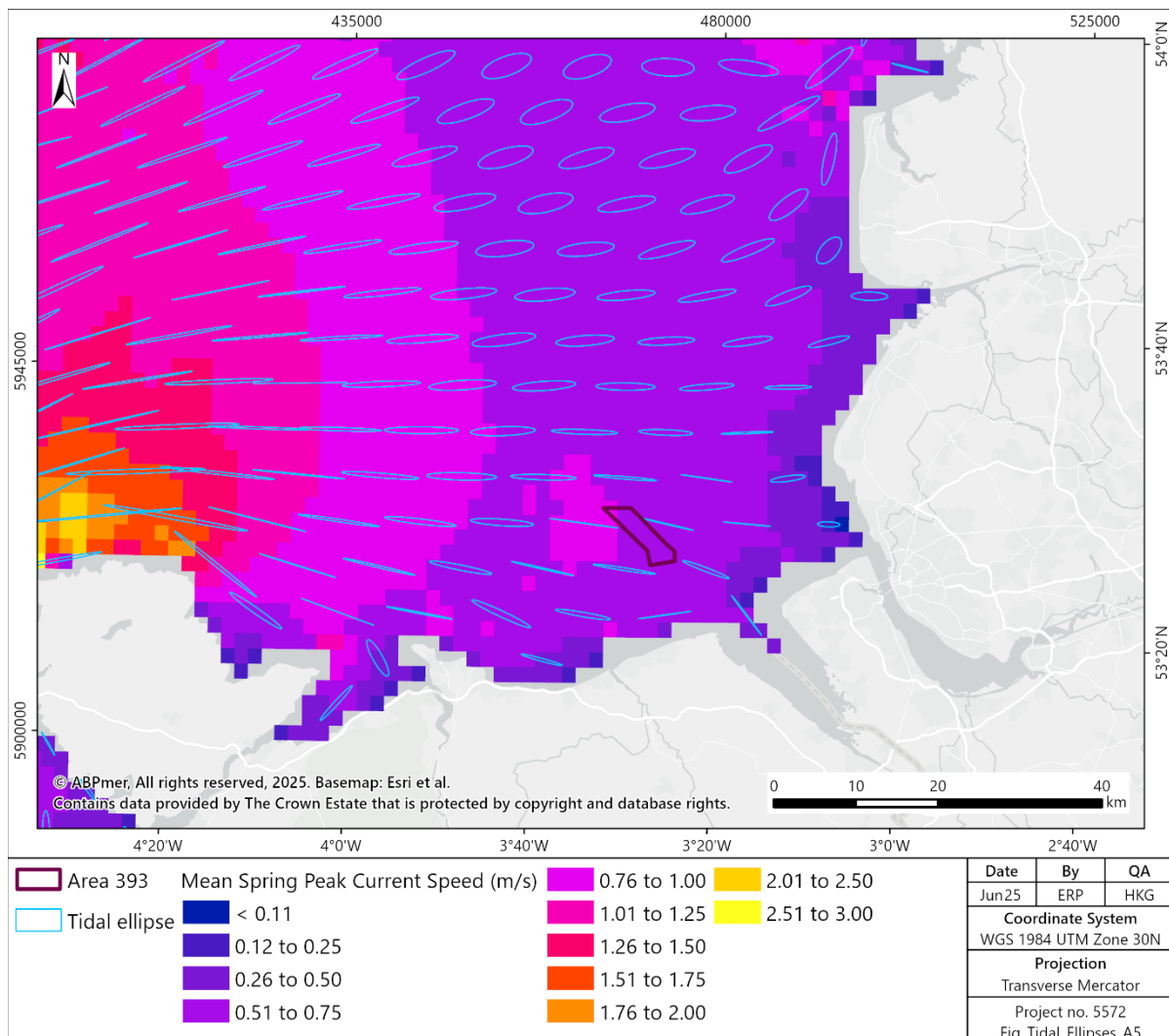
Source: UK Climate Projections (Palmer *et al.*, 2018)

For the Representative Concentration Pathway (RCP) 8.5 emissions scenario, the predicted increase in sea levels up to 2100 ranges from 0.36 to 0.90 m above 2025 levels (across the range of percentile confidence limits).

**Currents**

Within Liverpool Bay, tidal currents provide a moderately energetic environment with the flows typically greatest in the west and around the northern limit of Anglesey. A general asymmetry between flood and ebb phases occurs, with the flood tide having slightly stronger flows than the weaker, longer duration ebb currents.

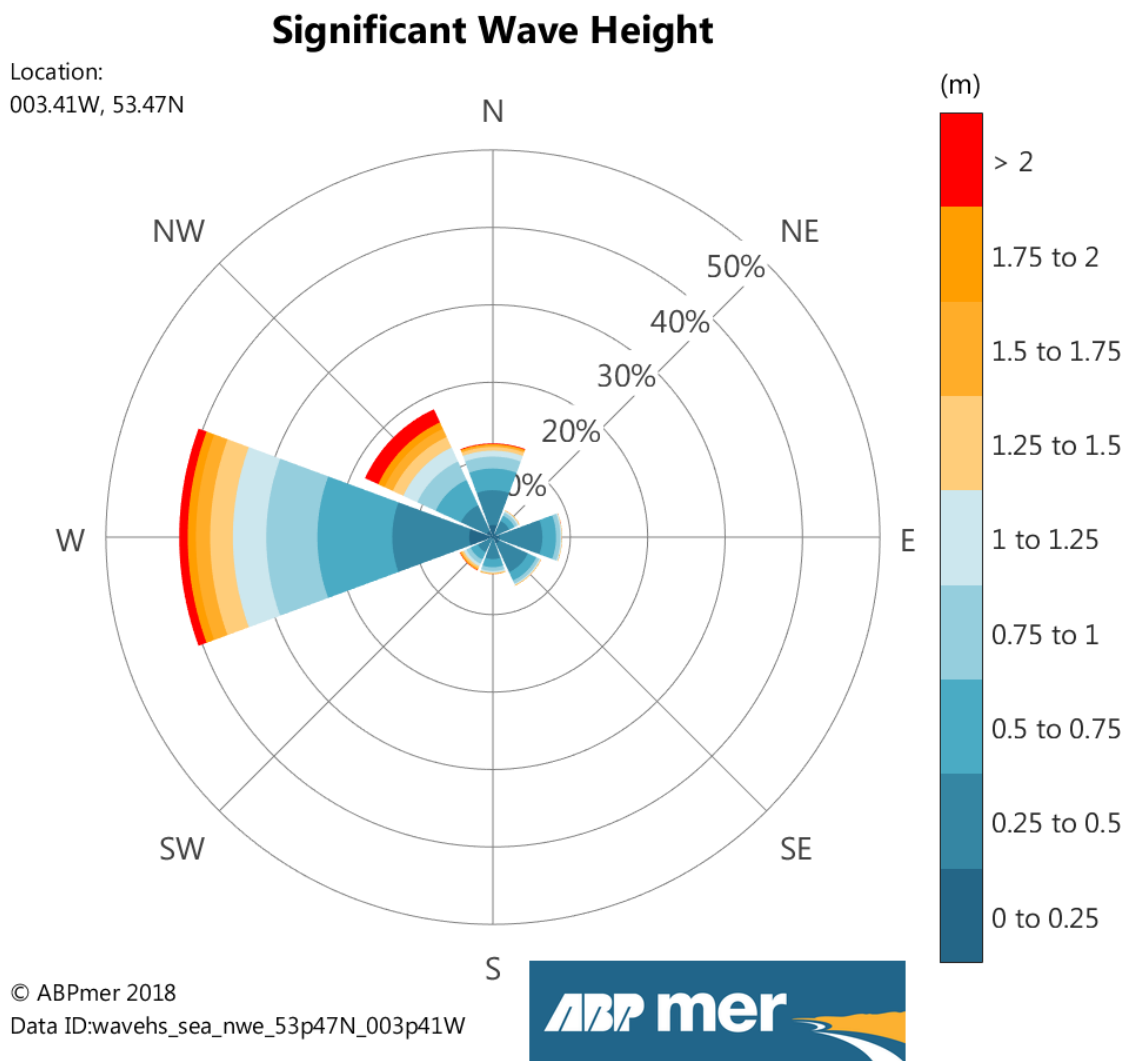
Regional model data from the UK Marine Renewables Atlas (ABPmer, 2008) is provided across the study area in Figure 4. As noted above, largest flows are present across the western extent of Liverpool Bay, reducing in magnitude with proximity to the North Wales and northwest England coastlines. Peak spring flows at the Area 393 site are typically between 0.5 and 0.75 m/s. Figure 4 also provides the general magnitude and extent of the spring tidal axis. The main tidal axis is generally rectilinear and orientated in an east/west direction. The magnitude of the tidal ellipse across the Licence Area (the maximum distance a parcel of water is expected to travel across a full spring tide) is around 7.7 km.



**Figure 4** Peak spring flow speeds and tidal excursion distance around Area 393

**Waves and winds**

The wave regime in Liverpool Bay is dominated by locally generated wind-waves across the wider region, with some influence of longer-period swell waves coming from the south at St. Georges Channel and from the north at the North Channel. An example wave rose for a location in southern Liverpool Bay is shown in Figure 5, based on 40-years of modelled hindcast data (ABPmer, 2018). The wave rose shows that across the sub-region, the dominant wave direction is coming from the west sector, with locally generated wind waves also approaching from the northwest, along the Irish Sea.



Source: ABPmer (2018) - SEASTATES

**Figure 5** Long-term average wave rose of significant wave heights in southern Liverpool Bay

**Sediment regime**

The following sections summarise the baseline characteristics of the local and regional sediment regime, accounting for sediment transport under both bedload and suspended load.

### Bedload

Bedload transport pathways in Liverpool Bay are in a net easterly direction, driving coarser-grained material into the Bay, and turning south-east towards the Dee and Mersey Estuaries (Kenyon and Cooper, 2005). This net easterly movement of bedload is the result of both the tidal asymmetry (i.e. flood dominance) and the prevailing west to east wave direction. Strong wave activity can promote significant reworking and dispersion of sand and mud deposits in Liverpool Bay. Wave activity can have a particularly important role to play under neap tide conditions, where net sand movement under tidal forcing alone is zero and undisturbed fine particle accumulation occurs. Therefore, when neap tidal processes are combined with wave activity, the general pattern of sediment transport and accumulation may be significantly altered as waves enhance the sediment transport rate. During spring tidal conditions, tidal forcing is sufficient for sediment transport to occur with wave activity providing a higher concentration of sediment to be transported, thus enhancing the general patterns of sediment transport (Thomas, 2002).

The North Wirral coastline is largely affected by the tidal and wave regime within Liverpool Bay. However, the presence of offshore banks provides a high degree of protection against the waves generated in the Bay. Sediment to the Wirral frontage is largely supplied from offshore, where transport is directed towards the North Wales coastline (Figure 6).

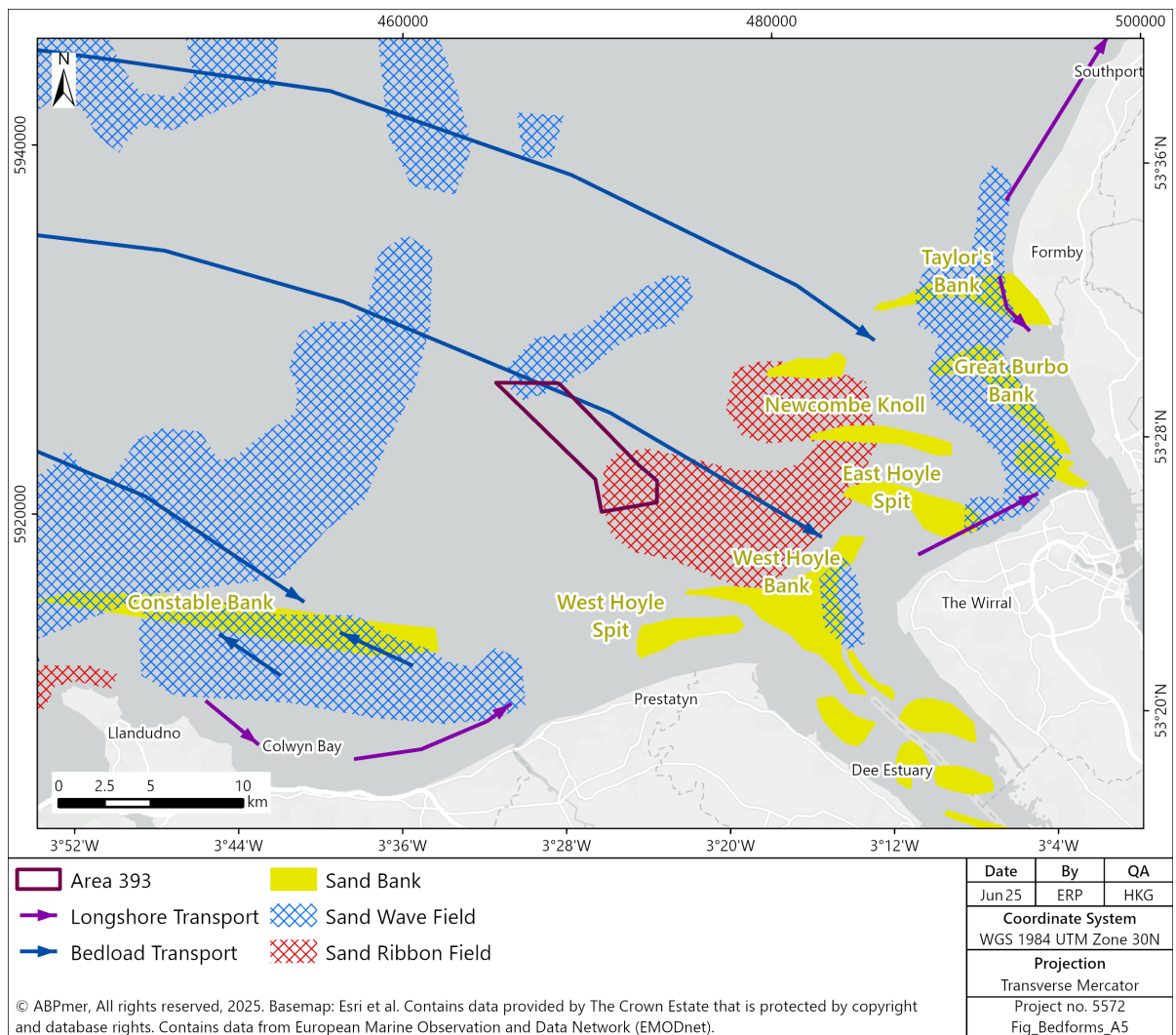


Figure 6 Regional bedform features and sand transport pathways around Area 393

The Dee Estuary largely acts as a sink for muds, silts and sands supplied as littoral drift from the North Wales coast. There is, however, some evidence of wave-induced current transport of sediment across the mouth via West Hoyle and East Hoyle sand bank. Littoral drift from the Wirral coastline does not continue across the mouth of the Mersey Estuary due to the complicated interaction of waves and strong tidal currents. Instead, the Mersey Estuary acts a sink for material lost from the Wirral frontage via easterly transport (Halcrow, 2010).

Along the Sefton Coast, a distinct divide in long-shore drift occurs at Formby Point where there is a change in the coastal orientation. To the south of Formby Point, net drift is directed south-east along the foreshore towards the mouth of the Mersey Estuary. To the north of Formby Point, drift is directed northwards towards the Ribble Estuary, which acts as a sand sink (ABPmer, 2002). The large-scale patterns of accretion and erosion on the Sefton Coast have been, and remain, heavily influenced by the creation of the Mersey Estuary training walls.

Modelling results from the Cell 11 Tidal and Sediment Study (CETaSS), undertaken as part of the North West England Shoreline Management Plan (SMP2) (Halcrow, 2010), suggest the sediment transport pathways through the wider region proceed in an east south-east direction. The model results provide an integrated yearly sediment transport rate for sand under both tidal and wave conditions within Liverpool Bay, which suggests that sediment transport rates increase towards the east. Transport rates across the wider region were estimated at between 30,000 and 500,000 m<sup>3</sup>/year, with the variation driven by changes in bathymetry, an increase in sediment availability towards the nearshore sandbanks and the variation in regional hydrodynamic processes.

### Suspended sediment

Suspended sediment transport pathways are controlled by tidal flows, with the net sediment movement dictated by the tidal residual. As seen with bedload transport, the transport of suspended sediment within Liverpool Bay is also in a net easterly direction.

Suspended sediment concentrations (SSC) are generally not uniform with depth but are typically lowest at the surface and increase towards the bed, where suspended sediments merge with the bedload sediments. The amount of suspended sediment does not adjust immediately to a change in flow strength, but a settling 'lag' exists in which suspended sediment takes time to adjust to changes in flow conditions (i.e. when flow is suddenly reduced, there is a period of time before settling occurs).

Available observations from the Moderate Resolution Imaging Spectroradiometer (MODIS) satellite database provide a comprehensive series of monthly/seasonal turbidity maps for surface waters (Dolphin *et al.*, 2011). As previously mentioned, although SSC measured at the surface are typically much lower than those experienced at the bed, they help to indicate the likely SSC profile with depth (i.e. SSC within the water column will vary between those measured at the surface and those near the bed). Based on the MODIS satellite data, surface SSC during winter months is typically in the range 15 to 30 mg/l, whilst during summer months, SSC are usually no greater than about 10 mg/l.

Additional data collected by Cefas from the Liverpool Bay Coastal Observatory SmartBuoy (situated within Liverpool Bay at a depth of 22 m) for the period 2003 to 2010, suggests that the mean winter (September-March (to include the equinoxes)) and summer (April-August) SSC for this eight-year period was circa 9 mg/l and 5 mg/l respectively. Surface values provided by the MODIS database at the SmartBuoy deployment location, indicate similar mean winter and summer SSC values of around 9 mg/l and 2 mg/l respectively.

A more detailed baseline description will be presented in the ES.

### 5.2.3 Possible environmental effects

Dredging within Area 393 has the potential to affect physical processes through a range of pathways. The following sections identify which likely environmental effects, with respect to physical processes, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in') and those which will not be assessed further (i.e. considered not likely to be significant and therefore 'scoped out').

#### Scoped in

Dredging within Area 393 has the potential to affect physical processes through the following impact pathways:

- Potential changes to the tidal regime;
- Potential changes to the wave regime;
- Potential changes to the sediment transport;
- Increased SSC and potential sedimentation over the extent of the dredge plume;
- Potential effects on bedforms across the wider study area; and
- Consideration of impact pathways in conjunction with climate change effects.

Marine aggregate extraction has the potential to indirectly change marine hydrodynamic processes, including currents and waves. The most important factors that drive these changes are the total volume of material removed and the water depths where aggregate extraction takes place.

#### Scoped out

Acknowledgment is given to the conclusions of the previous ES (ERM, 2012) and the studies that supported the assessment conclusions e.g. Hilbre Swash CIS (HR Wallingford, 2011). The ES for Area 393 suggested that the physical effects from dredging in the Licence Area were likely to be confined to the area and its immediate surroundings. Consequently, the following impact pathways are proposed to be scoped out of the EIA:

- **Potential reduction in beach volume from 'draw-down' of material into the dredged areas:** The previous ES (ERM, 2012) concluded that the potential for beach drawdown as a result of the proposed dredging activities in Area 393 was considered insignificant because Area 393 is located in deeper water (10-20 m) and located too far offshore (>12 km) to disrupt nearshore sediment transport processes. This was further confirmed by modelling 'worst case' hydrodynamic conditions which indicated no overlap/interaction of effects with the coastline (HR Wallingford, 2011). Consequently, beach draw-down is not considered a realistic impact pathway and is scoped out of the EIA for this project;
- **Potential effects on the coastline due to changes in wave height and tidal currents:** Given the distance of Area 393 from the coast (>12 km), the potential to impact this pathway is considered highly unlikely. Based on information presented in the previous ES (ERM, 2012) and supporting studies (HR Wallingford (2011), these concluded that the potential impact on the coast from changes in wave height and/or tidal currents was insignificant. Given the above, this impact pathway is scoped out of the EIA for this project; and
- **Potential effects on the coastline due to changes in sediment transport pathways:** Given the distance of Area 393 from the coast (>12 km), the potential to impact this pathway is considered highly unlikely. Based on information presented in the previous ES (ERM, 2012) and supporting studies (HR Wallingford (2011), these concluded that the potential impact of interrupted sediment supply to the coast as a result of aggregate extraction from Area 393 was insignificant. Given the above, this impact pathway is scoped out of the EIA for this project.

## 5.2.4 Further work required for EIA

The following key elements of work will be required as part of the EIA:

- A detailed review of physical processes at Area 393, and the surrounding region, based on existing available information;
- A review of relevant Area 393-specific baseline data and reports, including ongoing annual monitoring surveys and reporting, and studies undertaken in support of the previous marine licence applications;
- A review of existing relevant modelling studies and geophysical surveys, notably those used to support the previous ES (ERM, 2012; HR Wallingford, 2011); and
- Assessment of the identified impact pathways, to be carried out based on consideration of the proposed activities, set against the context of available monitoring data and pre-existing studies on the impacts of aggregate extraction across the study area.

It is not considered necessary to undertake a new dedicated CIS for this licence application. Instead, the previous ES and its supporting studies (e.g. ERM, 2012; HR Wallingford, 2011), will be drawn upon, as this considered the full removal of the entire resource at Area 393, as well as in-combination assessment of surrounding aggregate extraction areas in the region.

## 5.3 Water and sediment quality

This section sets out the proposed scope of the ES chapter that will report the findings of the water and sediment quality assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.3.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on water and sediment quality will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation, and guidance, including:

- MCAA;
- The Conservation of Habitats Regulations 2017;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- The Nitrate Pollution Prevention Regulations 2015 (as amended);
- The Urban Wastewater Treatment (England and Wales) Regulations 1994 (as amended);
- Shellfish Water Protected Areas (England and Wales) Directions 2016;
- UK MPS (HM Government, 2011);
- WNMP (Welsh Government, 2019);
- Environment (Wales) Act 2016;
- Well-being of Future Generation (Wales) Act 2015;
- Relevant local policy;
- Bathing Water Regulations 2013 (as amended); and
- UK Marine Strategy.

### 5.3.2 Description of the existing environment

The European Water Framework Directive (WFD) established a framework for the management and protection of Europe's water resources. As previously discussed in Section 3.4.2, this was implemented in Wales through the Water Environment (WFD) (England and Wales) Regulations 2017, known as the Water Framework Regulations. NRW publishes River Basin Management Plans (RBMPs), which set out

measures through which compliance with WFD objectives will be achieved. Area 393 is located outside of the Western Wales RBMP and the North West River Basin District RBMP, with the nearest WFD water body, 'North Wales coastal', being approximately 3 km away. This water body is heavily modified and has achieved Moderate Ecological Status. The water body has also achieved a moderate chemical status, resulting in a moderate overall water body status. Given Area 393 is located well outside 1 nautical mile of the coast, it is not considered necessary to conduct a WFD compliance assessment.

With regard to sediment quality, the most recent (2023) report by OSPAR suggests that, since 2010, sediment contaminant concentrations generally have continued to decrease in the majority of areas assessed. Polybrominated diphenyl ethers (PBDE) concentrations in sediments and biota within the Irish Sea are below the Federal Environmental Quality Guidelines and have shown a decrease in concentrations in recent years (Viñas *et al.*, 2022). Additionally, the previous ES (ERM, 2012) concluded that contaminants are not generally associated with Area 393.

A detailed analysis of available reports and data will be presented in the ES (more detail in Section 5.3.4).

### 5.3.3 Possible environmental effects

Dredging within Area 393 has the potential to affect water and sediment quality through a range of pathways. The following sections identify which likely environmental effects, with respect to water and sediment quality, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in') and those which will not be assessed further (i.e. considered not likely to be significant and therefore 'scoped out').

#### Scoped in

Dredging within Area 393 has the potential to affect water and sediment quality through the following impact pathways:

- Potential changes to SSC; and
- Potential changes to dissolved oxygen concentrations as a result of changes to SSC.

#### Scoped out

The following impact pathways are proposed to be scoped out of the EIA:

- **Changes to chemical water quality as a result of potential sediment-bound contaminants being released during dredging operations:** As described in Section 5.3.2, the sediments in Area 393 are considered to be free of contaminants due to being typically coarse in nature as well as their distance from any sources of contamination, such as licensed disposal sites. Therefore, there is not considered to be a pathway to effect for release of sediment-bound contaminants;
- **Redistribution of sediment-bound contaminants during dredging operations:** As above, there is not considered to be a pathway to effect for redistribution of sediment-bound contaminants; and
- **Changes to levels of contaminants in water (including accidental spillages) during dredging operations:** The proposed dredging operations will not directly introduce contaminants to the marine environment and the potential risk of spillages will be minimised and mitigated through the application of environmental good practice management measures.

Impacts related to vessel movement and risks of water quality impacts from accidents and incidents will be considered as part of the navigation impact assessment.

### 5.3.4 Further work required for EIA

The following key elements of work will be required as part of the EIA:

- A review of water and sediment quality conditions at Area 393, based on existing available information of the marine environment. This will include:
  - Existing area specific sediment data (e.g. vibrocore and grab sampling data);
  - Monitoring reports and other data from Area 393;
  - Previous and current CISOs, dredging plume studies and ES for Area 393; and
  - Available third-party reports and Area/regional specific sediment data (e.g. Cefas buoy data).
- Assessment of the identified pathways for water and sediment quality impacts.

A separate WFD compliance assessment will not need to be produced, as Area 393 is located outside 1 nautical mile of the coast.

## 5.4 Nature conservation and marine ecology

This section sets out the proposed scope of the ES chapter that will report the findings of the nature conservation and marine ecology assessment, with regards to potential effects as a result of the proposed aggregate dredging. Specifically, this includes consideration of potential effects on benthic habitats and species (including non-native species), fish and shellfish, and marine mammals. This section also considers marine and coastal ornithology.

### 5.4.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on nature conservation and marine ecology receptors will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation, and guidance, including:

- MCAA;
- The Wildlife and Countryside Act 1981, as amended;
- The Countryside and Rights of Way Act 2000;
- The Conservation of Habitats Regulations 2017;
- The Water Framework Regulations 2017;
- UK MPS (HM Government, 2011);
- WNMP (Welsh Government, 2019);
- Environment (Wales) Act 2016;
- Well-being of Future Generations (Wales) Act 2015;
- UK Biodiversity Action Plan, superseded by the UK Post-2010 Biodiversity Framework (JNCC, 2019);
- UK Marine Strategy; and
- Relevant local policy.

### 5.4.2 Description of the existing environment

#### Nature conservation sites

The following nature conservation sites (with marine components) are located within 20 km from Area 393 (also see Figure 7):

- Liverpool Bay SPA (overlaps Area 393);
- The Dee Estuary SPA and Ramsar (8.9 km south east from Area 393);

- The Dee Estuary SAC (10.6 km south east from Area 393);
- Mersey Narrows and North Wirral Foreshore SPA and Ramsar (12.4 km south east from Area 393);
- Ribble and Alt Estuaries SPA and Ramsar (18.9 km east from Area 393); and
- Sefton Coast SAC (18.9 km east from Area 393).

Further detail on these surrounding nature conservation sites, including conservation objectives and supporting habitats, can be found in Table 11 below.

The following sites of special scientific interest (SSSIs) are located within 20 km from Area 393 (also see Figure 7):

- Dee Estuary SSSI (10.6 km south east from Area 393);
- Dee Cliffs SSSI (18.3 km south east from Area 393);
- Red Rocks SSSI (14.1 km south east from Area 393);
- Meols Meadows SSSI (17.1 km south east from Area 393);
- Sefton Coast SSSI (18.9 km east from Area 393);
- North Wirral Foreshore SSSI (12.4 km south east from Area 393); and
- Thurstaston Common SSSI (18.5 km south east from Area 393).

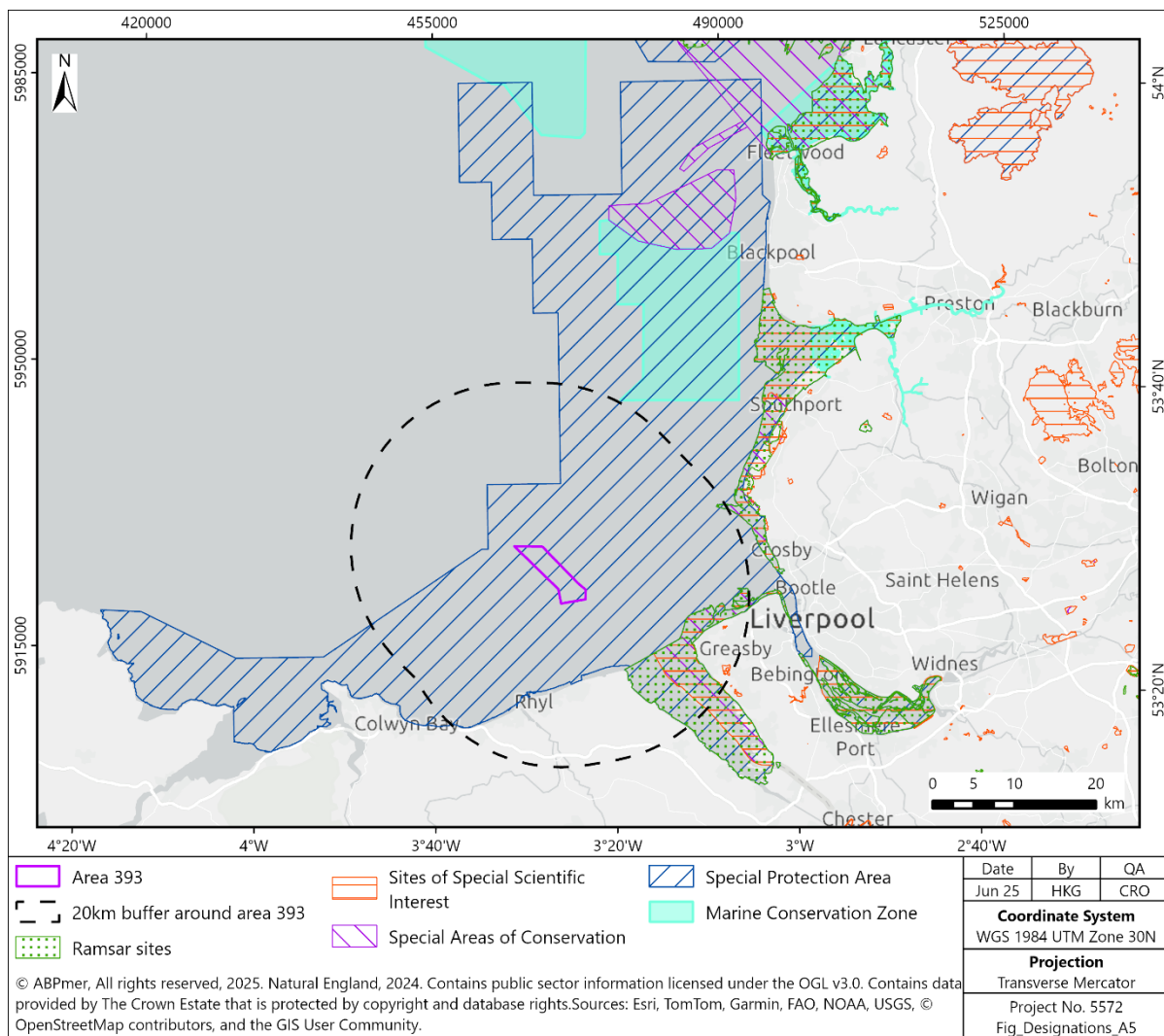


Figure 7. Nature conservation sites in the vicinity of Area 393

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The Liverpool Bay SPA covers an area of 2,528 km<sup>2</sup> and overlaps Area 393. The SPA is designated for the protection of Red-throated Diver (*Gavia stellata*), Common Scoter (*Melanitta nigra*), and Little Gull (*Hydrocoloeus minutus*) during the non-breeding season, as well as a waterbird assemblage, and foraging areas for Little Tern (*Sternula albifrons*) and Common Tern (*Sterna hirundo*) breeding within coastal SPAs (JNCC, 2022).

Many designated sites exist along the coast, some of which contain seabird breeding colonies. Those sites whose mobile features could be impacted by dredging in Area 393 will be noted and assessed in the EIA (and HRA). For seabirds, the mean maximum foraging ranges (+ 1 Standard Deviation (SD)), as reported by Woodward *et al.* (2019) will be applied in the scoping of nearby coastal sites.

Habitats and species of nature conservation interest may also be present in/around Area 393. For example, many marine habitats are classed as habitats or species of principal importance for the conservation of biodiversity in Wales under the Environment (Wales) Act (2016); this includes blue mussel beds and subtidal sands and gravels. Many marine species are furthermore afforded protection under various Acts and Regulations (see Section 3) or are listed as being of principal importance in Wales. The presence of such habitats and species, and impacts upon these, will also be highlighted and assessed in the ES, in the respective marine ecology sections.

**Table 11. Marine Protected Areas within 20 km of Area 393 – characteristics and conservation**

| Name              | General Site Characteristics   | Qualifying Interest Features   | Conservation Objectives   |
|-------------------|--|--|---|
| Liverpool Bay SPA | English and Welsh territorial waters in and offshore UK waters.  | <ul style="list-style-type: none"> <li>▪ Non-breeding Red-throated Diver (<i>Gavia stellata</i>);</li> <li>▪ Non-breeding Common Scoter (<i>Melanitta nigra</i>);</li> <li>▪ Non-breeding Little Gull (<i>Hydrocoloeus minutus</i>);</li> <li>▪ Breeding Common Tern (<i>Sterna hirundo</i>);</li> <li>▪ Breeding Little Tern (<i>Sternula albifrons</i>); and</li> <li>▪ Non-breeding waterbird assemblage.</li> </ul>  | <p>Ensure that 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;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of the habitats of the qualifying features;</li> <li>▪ The structure and function of the habitats of the qualifying features;</li> <li>▪ The supporting processes on which the habitats of the qualifying features rely;</li> <li>▪ The population of each of the qualifying features, and;</li> <li>▪ The distribution of the qualifying features within the site.</li> </ul> |
| Dee Estuary SPA   | The estuary is a large, funnel shaped, sheltered estuary that supports extensive areas of intertidal sandflats, mudflats, and saltmarsh. | <ul style="list-style-type: none"> <li>▪ A048 <i>Tadorna tadorna</i>; Common Shelduck (Non-breeding);</li> <li>▪ A052 <i>Anas crecca</i>; Eurasian Teal (Non-breeding);</li> <li>▪ A054 <i>Anas acuta</i>; Northern Pintail (Non-breeding);</li> <li>▪ A130 <i>Haematopus ostralegus</i>; Eurasian Oystercatcher (Non-breeding);</li> <li>▪ A141 <i>Pluvialis squatarola</i>; Grey Plover (Non-breeding);</li> <li>▪ A143 <i>Calidris canutus</i>; Red Knot (Non-breeding);</li> <li>▪ A149 <i>Calidris alpina alpina</i>; Dunlin (Non-breeding);</li> <li>▪ A156 <i>Limosa limosa islandica</i>; Black-tailed Godwit (Non-breeding);</li> <li>▪ A157 <i>Limosa lapponica</i>; Bar-tailed Godwit (Non-breeding);</li> <li>▪ A160 <i>Numenius arquata</i>; Eurasian Curlew (Non-breeding);</li> </ul> | <p>Ensure that 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;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of the habitats of the qualifying features;</li> <li>▪ The structure and function of the habitats of the qualifying features;</li> <li>▪ The supporting processes on which the habitats of the qualifying features rely;</li> <li>▪ The population of each of the qualifying features, and;</li> <li>▪ The distribution of the qualifying features within the site.</li> </ul> |

| Name               | General Site Characteristics   | Qualifying Interest Features  | Conservation Objectives  |
|--------------------|--|---|--|
|                    |  | <ul style="list-style-type: none"> <li>▪ A162 <i>Tringa totanus</i>; Common Redshank (Non-breeding);</li> <li>▪ A191 <i>Sterna sandvicensis</i>; Sandwich Tern (Non-breeding);</li> <li>▪ A193 <i>Sterna hirundo</i>; Common Tern (Breeding);</li> <li>▪ A195 <i>Sterna albifrons</i>; Little Tern (Breeding) ;</li> <li>▪ Waterbird assemblage</li> </ul>  |  |
| Dee Estuary SAC    | The estuary is a large, funnel shaped, sheltered estuary that supports extensive areas of intertidal sandflats, mudflats, and saltmarsh. | <ul style="list-style-type: none"> <li>▪ H1130. Estuaries;</li> <li>▪ H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats;</li> <li>▪ H1210. Annual vegetation of drift lines;</li> <li>▪ H1230. Vegetated sea cliffs of the Atlantic and Baltic coasts; Vegetated sea cliffs;</li> <li>▪ H1310. Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand;</li> <li>▪ H1330. Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>); Atlantic salt meadows;</li> <li>▪ H2110. Embryonic shifting dunes; Shifting dunes;</li> <li>▪ H2120. Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"); Shifting dunes with marram;</li> <li>▪ H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland*;</li> <li>▪ H2190. Humid dune slacks;</li> <li>▪ S1095. <i>Petromyzon marinus</i>; Sea lamprey;</li> <li>▪ S1099. <i>Lampetra fluviatilis</i>; River lamprey;</li> <li>▪ S1395. <i>Petalophyllum ralfsii</i>; Petalwort</li> </ul> | <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>▪ The structure and function (including typical species) of qualifying natural habitats</li> <li>▪ The structure and function of the habitats of qualifying species</li> <li>▪ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>▪ The populations of qualifying species, and,</li> <li>▪ The distribution of qualifying species within the site.</li> </ul> |
| Dee Estuary Ramsar | The estuary is an accreting system and the extent of saltmarsh continues to expand, whilst also  | <ul style="list-style-type: none"> <li>▪ Criterion 1 - natural or near-natural wetland: Estuaries, Mudflats and sandflats not covered by seawater at low tide, Annual vegetation of drift lines, Vegetated sea cliffs of the Atlantic</li> </ul>  | For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High-Level Conservation Objectives. As the provisions on the   |

| Name  | General Site Characteristics  | Qualifying Interest Features  | Conservation Objectives  |
|---|---|---|--|
|   | <p>supporting extensive areas of intertidal sand and mudflats. Where land-claim has not occurred, the saltmarshes grade into transitional brackish and freshwater swamp vegetation, on the upper shore. The site includes the three sandstone islands of Hilbre with their important cliff vegetation and maritime heathland/grassland. T</p> | <p>and Baltic coasts, <i>Salicornia</i> and other annuals colonising mud and sand, Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>), Embryonic shifting dunes, Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"), Fixed dunes with herbaceous vegetation ("grey dunes"), Humid dune slacks.</p> <ul style="list-style-type: none"> <li>▪ Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl.</li> <li>▪ Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance: Redshank, Shelduck, Oystercatcher, Curlew, Teal, Pintail, Grey Plover, Red Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Ruddy Turnstone.</li> </ul> | <p>Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.</p> <p>See the conservation objectives for Ramsar interest features covered by overlapping the Dee Estuary SAC and Dee Estuary SPA.</p>  |
| <p>Mersey Narrows and North Wirral Foreshore SPA</p>    | <p>The site comprises large areas of saltmarsh and extensive intertidal sand and mud flats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, along a rural and industrial stretch of coast.</p>   | <ul style="list-style-type: none"> <li>▪ A157. <i>Limosa lapponica</i>; Bar-tailed Godwit (non-breeding)</li> <li>▪ A177. <i>Hydrocoloeus minutus</i>; Little Gull (non-breeding)</li> <li>▪ A143. <i>Calidris canutus islandica</i>; Knot (non-breeding)</li> <li>▪ A193. <i>Sterna hirundo</i>; Common Tern (non-breeding)</li> <li>▪ A193. <i>Sterna hirundo</i>; Common Tern (breeding)</li> <li>▪ Waterbird assemblage</li> </ul>  | <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>▪ The structure and function (including typical species) of qualifying natural habitats</li> <li>▪ The structure and function of the habitats of qualifying species</li> <li>▪ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>▪ The populations of qualifying species, and,</li> <li>▪ The distribution of qualifying species within the site.</li> </ul> |
| <p>Mersey Narrows and North Wirral Foreshore Ramsar</p> | <p>The site comprises large areas of saltmarsh and extensive intertidal sand and</p>  | <ul style="list-style-type: none"> <li>▪ Criterion 4 – Plant and/or animal species at critical stages of their life cycles: Little gulls, Common terns.</li> </ul>  | <p>For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High-</p>   |

| Name                         | General Site Characteristics  | Qualifying Interest Features   | Conservation Objectives  |
|------------------------------|---|--|--|
|                              | mud flats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, along a rural and industrial stretch of coast.  | <ul style="list-style-type: none"> <li>▪ Criterion 5 – Bird Assemblages of International Importance: waterbirds.</li> <li>▪ Criterion 6 - Bird Species/Populations Occurring at Levels of International Importance: Knot, Bar-tailed godwits.</li> </ul>   | <p>Level Conservation Objectives. As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.</p> <p>See the conservation objectives for Ramsar interest features covered by overlapping the Mersey Narrows and North Wirral Foreshore SPA.</p>  |
| Ribble and Alt Estuaries SPA | A large area including two estuaries which form part of the chain of west coast sites which fringe the Irish Sea. The site is formed by 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. | <ul style="list-style-type: none"> <li>▪ A037 <i>Cygnus columbianus bewickii</i>; Bewick's Swan (Non-breeding)</li> <li>▪ A038 <i>Cygnus cygnus</i>; Whooper Swan (Non-breeding)</li> <li>▪ A040 <i>Anser brachyrhynchus</i>; Pink-footed Goose (Non-breeding)</li> <li>▪ A048 <i>Tadorna tadorna</i>; Common Shelduck (Non-breeding)</li> <li>▪ A050 <i>Anas penelope</i>; Eurasian Wigeon (Non-breeding)</li> <li>▪ A052 <i>Anas crecca</i>; Eurasian Teal (Non-breeding)</li> <li>▪ A054 <i>Anas acuta</i>; Northern Pintail (Non-breeding)</li> <li>▪ A130 <i>Haematopus ostralegus</i>; Eurasian Oystercatcher (Non-breeding)</li> <li>▪ A137 <i>Charadrius hiaticula</i>; Ringed Plover (Non-breeding)</li> <li>▪ A140 <i>Pluvialis apricaria</i>; European Golden Plover (Non-breeding)</li> <li>▪ A141 <i>Pluvialis squatarola</i>; Grey Plover (Non-breeding)</li> <li>▪ A143 <i>Calidris canutus</i>; Red Knot (Non-breeding)</li> <li>▪ A144 <i>Calidris alba</i>; Sanderling (Non-breeding)</li> </ul> | <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;</p> <ul style="list-style-type: none"> <li>▪ The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>▪ The structure and function (including typical species) of qualifying natural habitats</li> <li>▪ The structure and function of the habitats of qualifying species</li> <li>▪ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>▪ The populations of qualifying species, and,</li> <li>▪ The distribution of qualifying species within the site.</li> </ul> |

| Name                            | General Site Characteristics  | Qualifying Interest Features   | Conservation Objectives   |
|---------------------------------|---|--|---|
|                                 |   | <ul style="list-style-type: none"> <li>▪ A149 <i>Calidris alpina alpina</i>; Dunlin (Non-breeding)</li> <li>▪ A151 <i>Philomachus pugnax</i>; Ruff (Breeding)</li> <li>▪ A156 <i>Limosa limosa islandica</i>; Black-tailed Godwit (Non-breeding)</li> <li>▪ A157 <i>Limosa lapponica</i>; Bar-tailed Godwit (Non-breeding)</li> <li>▪ A162 <i>Tringa totanus</i>; Common Redshank (Non-breeding)</li> <li>▪ A183 <i>Larus fuscus</i>; Lesser Black-backed gull (Breeding)</li> <li>▪ A193 <i>Sterna hirundo</i>; Common Tern (Breeding)</li> <li>▪ Waterbird assemblage</li> <li>▪ Seabird assemblage</li> </ul>                               |   |
| Ribble and Alt Estuaries Ramsar | A large area including two estuaries which form part of the chain of west coast sites which fringe the Irish Sea. The site is formed by 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. | <ul style="list-style-type: none"> <li>▪ Criterion 2 - Vulnerable, endangered, or critically endangered species: Natterjack toads (<i>Bufo calamita</i>)</li> <li>▪ Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl.</li> <li>▪ Criterion 6 - Bird Species/Populations Occurring at Levels of International Importance: Lesser Black-backed Gull, Ringed Plover, Grey Plover, Red Knot, Sanderling, Dunlin, Black-tailed Godwit, Common Redshank, Lesser Black-backed Gull, Tundra Swan, Whooper Swan, Pink-footed Goose, Common Shelduck, Wigeon, Teal, Pintail, Oystercatcher, Bar-tailed Godwit.</li> </ul> | <p>For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High-Level Conservation Objectives. As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.</p> <p>See the conservation objectives for Ramsar interest features covered by overlapping the Ribble and Alt Estuaries SPA.</p> |
| Sefton Coast SAC                | The Sefton Coast in north-west England displays both rapid erosion and active shifting dunes, home to a number of qualifying habitats and species.  | <ul style="list-style-type: none"> <li>▪ H2110. Embryonic shifting dunes</li> <li>▪ H2120. Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"); Shifting dunes with marram</li> <li>▪ H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland*</li> </ul>   | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;   |

| Name  | General Site Characteristics | Qualifying Interest Features   | Conservation Objectives   |
|---|------------------------------|--|---|
|   |                              | <ul style="list-style-type: none"> <li>▪ H2150. Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>); Coastal dune heathland*</li> <li>▪ H2170. Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>); Dunes with creeping willow</li> <li>▪ H2190. Humid dune slacks</li> <li>▪ S1166. <i>Triturus cristatus</i>; Great crested newt</li> <li>▪ S1395. <i>Petalophyllum ralfsii</i>; Petalwort</li> </ul> | <ul style="list-style-type: none"> <li>▪ The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>▪ The structure and function (including typical species) of qualifying natural habitats</li> <li>▪ The structure and function of the habitats of qualifying species</li> <li>▪ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>▪ The populations of qualifying species, and,</li> <li>▪ The distribution of qualifying species within the site.</li> </ul> |
| <ul style="list-style-type: none"> <li>▪ * denotes a priority natural habitat or species</li> </ul> |                              |  |   |

(Natural England, 2018a; 2018b; 2019a; 2019b; 2019c; 2019d; JNCC, 1995; 2005; 2013)

## Benthic ecology

### Area 393

A benthic survey was undertaken by The Centre for Marine and Coastal Studies (CMACS) in 2011 with the aim of characterising the benthic fauna at Area 393. The survey identified 7,448 individuals represented from 283 unique taxa from grab samples. Faunal abundance varied across the survey area, with a moderately populated central zone, while sparser populations were observed toward the southeast and inshore areas near the Dee Estuary, where the seabed was shallower and sandier. Taxonomic richness also showed spatial variability across the survey area, with higher richness concentrated in the central region characterized by mixed sediments. A general trend of increasing richness was observed from the southeast to the northwest, while inshore areas exhibited notably low levels of taxonomic richness (ERM, 2012).

Annelids, crustaceans, and molluscs were the most common faunal groups, making up 78 % of all recorded taxa. Other groups were much less diverse. Annelids were the most numerically abundant faunal group, accounting for nearly two-thirds of all organisms found. The most frequently encountered taxa were the polychaete *Spiophanes bombyx* and Nemertea. Other characterising species included the burrowing cnidarian *Cerianthus lloydii*, and the brittlestar, *Amphiura filiformis*.

Additionally, the survey identified two main biotopes namely SS.SCS.CCS.MedLumVen, *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel (coded as A5.142 under the EUNIS classification system); and SS.SCS.ICS.MoeVen, *Moerella* spp. with venerid bivalves in infralittoral gravelly sand (EUNIS A5.133).

### Benthic (RSMP) monitoring

Insights into the benthic communities present at Area 393 can be derived from the RSMP monitoring (Ocean Ecology, 2022); see Figure 8.

The 2022 RSMP survey identified a total of 127 taxa and 654 individuals in the 9 macrobenthic sampling stations in the vicinity of Area 393 (Figure 8). Of the 127 taxa, 54 % belonged to Annelida, 17 % to Mollusca, 16 % to Crustacea; 3 % to Echinodermata; and the remaining 9 % belonged to Miscellaneous taxonomic groups (Ocean Ecology, 2022). Common species identified included the bristle worm *Scalibregma inflatum* and *Spiophanes bombyx*, the trumpet worm *Lagis koreni* and the white catworm *Nephtys cirrosa*.

### Non-native species

In general, non-native species find their way into UK coastal waters by a variety of means; however, the most significant mode is via shipping by attachment to hulls or in ballast water. The high levels of commercial shipping within Liverpool Bay and the Dee Estuary have contributed to the spread of non-native species across the region. Three non-native species were recorded within the 2022 RSMP survey, the barnacle *Austrominius modestus*, the Atlantic jack-knife clam *Ensis leei* and the polychaete *Goniadella gracilis* (Ocean Ecology, 2022).

A more detailed identification of invasive non-native species (INNS) and species non-native to UK waters will be presented in the ES, drawing on OneBenthic's None-Native Tool, amongst others (see also Section 5.4.4).

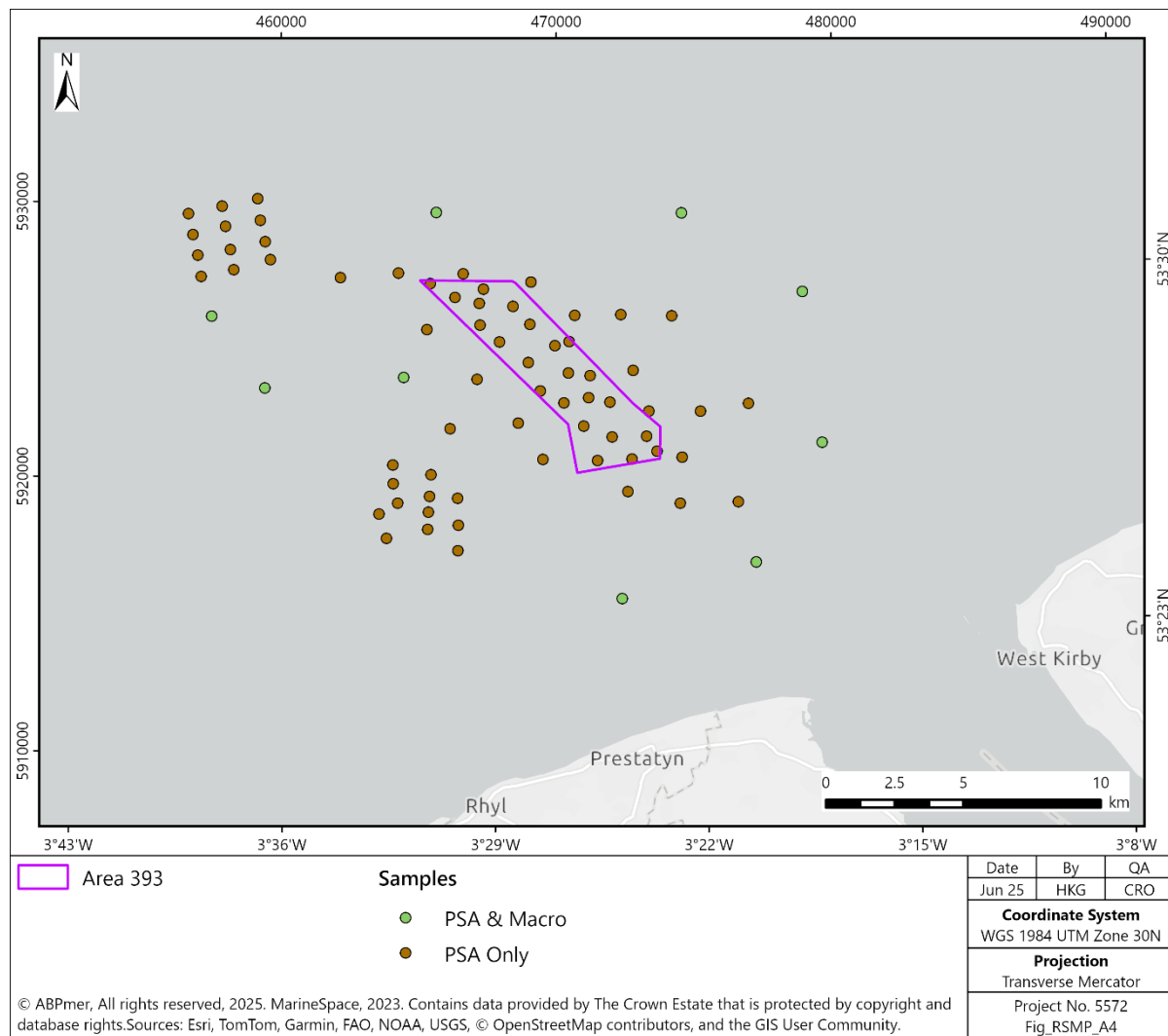


Figure 8. Map showing location of benthic ecology sampling stations around Area 393 (2022)

### Fish and Shellfish

There is a diverse array of bottom-dwelling, pelagic fish and shellfish in Liverpool Bay. This includes commercially important demersal species, such as sandeel, whiting *Merlangius merlangus*, lemon sole *Microstomus kitt*, ling *Molva molva*, plaice *Pleuronectes platessa*, cod *Gadus morhua* and European hake *Merluccius merluccius* (ABPmer, 2023; RPS, 2024). In addition, a range of pelagic species, such as herring *Clupea harengus*, mackerel *Scomber scombrus*, sprat *Sprattus sprattus* and European sea bass *Dicentrarchus labrax* are also found in Liverpool Bay (ABPmer, 2022; 2023; RPS, 2024).

Commonly occurring elasmobranch species in the region include, small-spotted catshark *Scyliorhinus canicular*, tope shark *Galeorhinus galeus*, thornback ray *Raja clavata* and starry smooth-hounds *Mustelus asterias* (ABPmer, 2022; RPS, 2024).

Diadromous species such as Atlantic salmon *Salmo salar*, European eel *Anguilla anguilla*, sea trout *Salmo trutta*, river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus* and allis shad *Alosa alosa* are known to migrate through Liverpool Bay to nearby rivers, including the River Dee and River Mersey (ABPmer, 2023; RPS, 2024).

A number of commercially important shellfish species are also present in the region, including, European lobster *Homarus gammarus*, edible crab *Cancer pagurus*, common whelk *Buccinum undatum*, brown shrimp *Crangon crangon* and langoustines *Nephrops* (ABPmer, 2022; 2023; RPS, 2024).

Sandeel, herring, cod, mackerel, plaice, sole and whiting spawning and nursery grounds have been identified within Liverpool Bay, as well as Ling, Anglerfish, Thornback Ray and Spotted Ray nursery grounds (Coull *et al.*, 1998, Ellis *et al.*, 2012).

A more detailed review of fish and shellfish species likely to be present in and around Area 393 (including for spawning and as a nursery area) will be presented in the ES, and their nature conservation interest clarified (see also Section 5.4.4).

### Marine mammals and turtles

The most commonly recorded marine mammals recorded in Liverpool Bay are grey seals *Halichoerus grypus*, as well as the cetaceans, harbour porpoise *Phocoena phocoena* and bottlenose dolphin *Tursiops truncatus*. Other species are recorded more rarely (Baines and Evans, 2012; Gilles *et al.*, 2023; Sea Watch Foundation 2025, Heinänen and Skov, 2015; ABPmer, 2023).

Harbour porpoise *Phocoena Phocoena* is regularly present year round within Liverpool Bay (Heinänen and Skov, 2015; DECC, 2016, ABPmer, 2023). In recent years, bottlenose dolphins have also been sighted increasingly in Liverpool Bay and off the coast of mainland North-east Wales, in both winter and summer with a relatively large proportion of these having been positively matched to the Cardigan Bay catalogue (Lohrengel *et al.*, 2018; ABPmer, 2022).

Grey seal *Halichoerus grypus* is regularly recorded in Liverpool Bay foraging. On the eastern (English) side of the Dee Estuary a large grey seal 'haul out' of 300 to 800 individuals can be found on the West Hoyle sandbank adjacent to Hilbre Island (CCW and Natural England, 2010; Baines and Evans, 2012; Westcott and Stringell, 2004). However, grey seals do not breed at this site as it is used solely for moulting and during feeding trips (Baines and Evans, 2012). Specific tagging studies of seals from the West Hoyle Bank colony has shown foraging to occur almost exclusively within the Liverpool Bay and Irish Sea area (Baines and Evans, 2012; Carter *et al.*, 2020). This is reflected in high predicted at-sea densities of grey seals in Liverpool Bay (Carter *et al.*, 2020). Grey seal occurrence in the vicinity of Area 393 appears to peak in the winter (RWE Npower, 2008).

The leatherback turtle is recorded very rarely in the Liverpool Bay region (DECC, 2016; BEIS, 2022).

A detailed analysis of available surveys and other data will be presented in the ES; see Section 5.4.4 for more detail.

### Ornithology

This baseline review will focus on those species that forage wholly or mainly in the marine environment (both offshore and coastal), through either diving or feeding on the water surface. In the UK, these species consist of seabirds (petrels, shearwaters, cormorants, skuas, gulls, terns and auks), divers, grebes, seaducks and diving ducks. Other species of waterbird have not been included as no significant impact pathway has been identified for these species.

Liverpool Bay is known to support important populations of seabirds and other diving birds. This includes wintering populations of Common Scoter, Red-throated Diver, Cormorants, Red-breasted Merganser and Little Gull (HiDef Aerial Surveying Ltd, 2023; Kaiser, 2002; Natural England, 2010; Schwemmer *et al.*, 2019; Waggitt *et al.*, 2020; Bradbury *et al.* 2014). Aerial survey data collected between

2015 and 2020 were used to predict density and abundance estimates in Liverpool Bay. Common Scoters were the most abundant species recorded with a peak population estimate of over 200,000 birds (HiDef Aerial Surveying Ltd, 2023). The study also predicted peak population estimates of over 3,000 Cormorants, 2,000 Red-throated Diver, 280 Little Gull and 150 Red-breasted Merganser. Other species commonly recorded in the surveys included Herring Gull, Common Gull, Great Crested Grebe, Guillemots and Kittiwakes (HiDef Aerial Surveying Ltd, 2023).

The coastal waters near Area 393 support valuable feeding, breeding and roosting grounds for a number of resident and migratory birds. Terns breed in the region with Little Tern nesting at the Gronant dune system near Prestatyn and Common Terns nest at Shotton Steelworks (Deeside).

The Dee Estuary is one of the most important estuaries in Britain for its wintering populations of waterbirds and supports large numbers of diving birds including Common Scoter, Cormorant and gulls (Calbrade *et al*, 2025).

The importance of the region for birds is reflected in the designation of several SPAs, such as Liverpool Bay SPA which overlaps Area 393. As noted previously, this SPA was designated to protect breeding Common and Little Terns as well as Red-throated Diver, Common Scoter and Little Gull (see Table 11).

A detailed analysis of available surveys and other data will be presented in the ES; see Section 5.4.4 for more detail.

### 5.4.3 Possible environmental effects

Dredging within Area 393 has the potential to affect marine ecological receptors through a number of key pathways. These are identified for each receptor group below. The potential impacts upon designated nature conservation interest features will be assessed in the appropriate receptor group sections. The following sections identify which likely environmental effects, with respect to marine ecological receptors, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in') and those which will not be assessed further (i.e. considered not likely to be significant and therefore 'scoped out').

#### Scoped in

##### Benthic ecology

Dredging has the potential to affect benthic species and habitats through the following impact pathways:

- Potential impacts on benthic species and habitats receptors from seabed removal (species and habitat loss);
- Potential impacts due to the suspended sediment plume (increased SSC);
- Potential impacts due to fine sand dispersion (including bedform) and deposition;
- Potential impacts due to bathymetric changes (including sediment flux) following dredging;
- Potential disturbance due to underwater noise and vibration; and
- Potential impacts through the introduction of non-native species.

### Fish and shellfish

Dredging has the potential to affect fish and shellfish through the following impact pathways:

- Potential impacts of seabed removal (habitat loss) on spawning, nursery and overwintering grounds;
- Potential impacts due to changes in water and sediment quality (due to fine sediment plume and fine sand dispersion);
- Direct loss of prey for bottom feeding species as a result of dredging operations; and
- Potential impacts due to underwater noise and vibration.

### Marine mammals

Dredging has the potential to affect marine mammals through the following impact pathways:

- Potential impacts to marine mammals due to the removal of seabed (habitat loss);
- Potential impacts from reduced water clarity (increased SSC) due to the suspended sediment plume; and
- Potential disturbance due to the underwater noise and vibration.

### Ornithology

Dredging has the potential to affect ornithology through the following impact pathways:

- Potential indirect effects on seabirds and other marine feeding birds as a result of seabed removal (including prey availability);
- Potential impacts on the foraging of seabirds and other marine feeding birds due to suspended sediment plumes (increased SSC); and
- Potential impact of disturbance generated by vessel presence on seabirds and other marine feeding birds (including visual, airborne noise and vibration).

Waterbirds (i.e. waders and wildfowl) that are restricted to utilising intertidal habitats, or shallow inshore habitats near the coast, will not be affected by dredging at Area 393, as they do not feed in, or roost over the deeper offshore waters in Area 393.

### Scoped out

The following impact pathways are proposed to be scoped out of the EIA:

#### Marine mammals and turtles

- **Potential impacts on turtles:** While leatherback turtles (the only turtle species that undertakes deliberate, seasonal migratory movement to UK waters) are recorded in UK and Irish Sea waters, sightings in the Liverpool Bay region are very rare (DECC, 2016, BEIS, 2022). Therefore, potential impacts on this receptor have been scoped out of the assessment; and
- **Potential collision risk to marine mammals due to vessel movements:** Vessels involved in dredging operations will mainly be stationary, operating within the boundary of the ADZ or travelling at low speeds to and from Area 393 (typically around 3-5 knots) making the risk of collision with marine mammals very low. Furthermore, through regular exposure to high vessel movements, marine mammals utilising the area around Area 393 will routinely need to avoid collision and are also expected to be habituated to high levels of disturbance stimuli. On this basis, this pathway has been scoped out of further assessment.

#### 5.4.4 Further work required for EIA

The following key elements of work will be required as part of the EIA:

- Review of available sources of information (see Table 12 for more detail on the proposed main sources of information for the individual sub-topics, and Section 2.1.1 for previous and ongoing surveys); and
- Assessment of the effects of dredging on the identified impact pathways for each of the receptor groups (see Section 5.4.3), based on available data and consideration of the proposed activities.

The following data sources will be consulted / interpreted:

- Relevant GIS data from the regulators to confirm designated site boundaries and associated features; and
- Conservation advice for relevant European sites produced under Regulation 37 of the Habitats Regulations.

No new dedicated marine ecology characterisation surveys have been proposed for the EIA phase for Area 393. Hilbre Swash RSMP style surveys were undertaken in 2014, 2017 and more recently in 2022, with site specific particle size grab samples and regional (context site) macro benthic grab samples collected in all years.

Macrobenthic samples within Area 393 were last collected during the 2014/15 RSMP surveys; focussing on the PIZ and SIZ, as well as nearby reference and context sites. It is considered that sufficient data is available for baseline characterisation for EIA purposes, given the extensive site specific monitoring surveys which have been undertaken over the years. These include offshore bathymetric and geophysical monitoring, vibrocore and grab sampling surveys (see Table 2).

It should also be noted that consideration of biosecurity is now standard practice during operations at marine aggregate production licence areas through the use of the Biosecurity Plan Template and Guidance Document (BMAPA and ABPmer, 2018) and the invasive species reporting protocol.

Table 12. Proposed main sources for marine ecology / conservation receptor chapters.

| Marine Ecology Topic                            | Proposed Main Sources of Information   |
|---|--|
| Nature conservation sites and species           | <p>Relevant GIS site data; Natural England’s designated sites view website; detailed information on features, conservation objectives and distances*.</p> <p>* See Table 11 for detail on the nearest MPAs, including their supporting habitats and conservation objectives.</p>   |
| Marine ecology - benthic habitats and species   | <p>Area 393-specific benthic data and reports (e.g. APEM, 2014; Ocean Ecology, 2022; MarineSpace, 2023); RSMP / Cefas’ OneBenthic Tools*; European Marine Observation and Data Network (EMODnet); EUSeaMap data; National Biodiversity Network (NBN) gateway.</p> <p>*Detailed analysis of available macro benthic grab data to be undertaken (notably the 2014/15 baseline data, also 2017 and 2022 for context sites), and results presented with regard to: biotopes and their diversity, function, abundance, extent, species richness, representativeness, rarity and sensitivity. Species and habitats of conservation importance will be highlighted, and INNS / non-native species identified.</p> |
| Marine ecology - Fish and shellfish ecology     | <p>Cefas nursery and spawning grounds, and essential fish habitats, reports and data layers; Fish Atlas of the Celtic Sea, North Sea, and Baltic Sea data; Recent baseline fish survey data for offshore windfarms and potential tidal lagoon projects in the region (where publicly available); 2024 herring and sandeel methodology update and 2025 ERM Herring/Sandeel heat mapping update.</p>   |
| Marine ecology - Marine and coastal ornithology | <p>Seabird Monitoring Programme Online Database; European Seabirds at Sea Database, seabird foraging range information; Birdlife International seabird database; British Trust for Ornithology (BTO) Bird Atlas data; Liverpool Bay aerial survey data for Red-throated Diver and other key species; JNCC gull population and distribution data.</p>   |
| Marine ecology - Marine mammals and turtles     | <p>Atlas of Marine Mammals of Wales; Small Cetacean Abundance in the European Atlantic and North Sea programmes IV, Special Committee on Seals Annual Report; Cardigan Bay bottlenose dolphin population and distribution data; Marine mammal survey and acoustic data for offshore windfarms and potential tidal lagoon projects in the region (where publicly available); seal telemetry studies; JNCC reports highlighting areas of high density for harbour porpoise; Joint Cetacean Protocol data; Sea Watch Foundation sightings data; Offshore Energy SEA 4 Environmental Baseline.</p>   |

## 5.5 Commercial and recreational fisheries

This section sets out the proposed scope of the ES chapter that will report the findings of the fisheries assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.5.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on fisheries receptors will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation and guidance, including:

- MCAA;
- The Water Framework Regulations 2017;
- UK MPS (HM Government, 2011);
- UK Fisheries Act 2020;
- UK Marine Strategy;
- WNMP (Welsh Government, 2019); and
- Relevant local policy.

The UK Fisheries Act 2020 and the Joint Fisheries Statement (2022) set out obligations for Defra and the Welsh Government to develop Fishery Management Plans (FMPs). The first of these was published in 2023, including joint FMPs for bass and king scallop in English and Welsh waters. Shared stock FMPs, including two Irish Sea plans and two Celtic Sea plans for both pelagic and demersal stocks, are currently being developed. The Welsh crab and lobster FMP is expected to be published in 2026, and a cockle FMP for Welsh waters in 2028.

### 5.5.2 Description of the existing environment

The North East Irish Sea supports a diverse and profitable fishery, with pelagic species like mackerel, herring, and sprat, and demersal species such as bass, dogfish, skates and rays (ERM, 2012; MMO, 2020). The region also hosts various commercial fish species, supporting a number of UK and international fishing fleets (ERM, 2012). Landings data have been obtained from the MMO for ICES rectangle 35E6, in which Area 393 is located. In 2023, 646 tonnes of fish and shellfish were landed from ICES rectangle 35E6, with a value of £1,086,970. Of this, 638 tonnes were shellfish and 9 tonnes were demersal fish (MMO, 2023).

At a local scale, potting for whelks, lobster, and prawns provides the majority of income to fishermen within and surrounding Area 393. The Queen scallop fishery is also particularly significant in Liverpool Bay, comprising a large proportion of overall UK landings of Queen scallop. Table 13 shows the species landed in 2023 from ICES rectangle 35E6 (MMO, 2023). Many vessels use a variety of techniques and gear throughout the year to take advantage of the seasonal availability of different species. Most inshore fishing vessels are less than 10 m in length, with more robust and larger vessels fishing further offshore. The majority of fishing within the wider region takes place within the six nautical mile limit (ERM Ltd, 2012).

Sightings data will be requested from the MMO for the EIA to determine the level of fishing pressure and seasonality of fishing activity in the area. The Wales Marine Planning tool indicates that between 2012 and 2022, there was scallop fishing activity overlapping the aggregate Licence Area<sup>5</sup>.

<sup>5</sup> [Wales Marine Planning Portal](https://lle.gov.wales/apps/marineportal/) (source: <https://lle.gov.wales/apps/marineportal/>)

Table 13. Value of landings by species in 2023 from ICES rectangle 35E6 (MMO, 2023)

| Species   | Value (to the nearest £) |
|---|--------------------------|
| Whelks  | £736,429                 |
| Lobsters  | £163,388                 |
| Common prawns                                     | £75,535                  |
| Scallops  | £46,007                  |
| Bass  | £35,374                  |
| Queen scallops                                    | £14,595                  |
| Thornback ray                                     | £6,674                   |
| Crabs ( <i>Cancer pagarus</i> (C.P). Mixed Sexes) | £5,179                   |
| Sole  | £2,592                   |
| Plaice  | £352                     |
| Cod   | £305                     |
| Flounder or flukes                                | £220                     |
| Mullet - other                                    | £213                     |
| Crabs - velvet (swim)                             | £46                      |
| Mackerel  | £40                      |
| Pollack   | £21                      |

Recreational fishing in the area is popular due to the varying coastal conditions and variety of species. There are a number of angling charter boats, both boat and shore-based angling clubs, angling shops, as well as thousands of individuals not affiliated with a club located in the area. Regional sea fishing social media groups have in excess of 12,000 members, which reflect the importance of the sport<sup>6</sup>. Sea angling charters tend to target Liverpool Bay in the summer months when weather conditions are better, with boats targeting the Mersey Estuary during the winter. Much of Liverpool Bay is commercially fished and wreck sites can be particularly important for recreational anglers as these are not targeted by commercial fishing vessels.

In general, fishing activity within the ICES rectangles is highest February to October and is reduced in December and January.

Since 2000, there has been a cod recovery programme implemented over a large area of the Irish Sea that includes the study area. This programme aims to reduce exploitation of cod spawning stock which ICES considered to be on the verge of collapse within the Irish Sea (ICES, 2025).

The closest shellfish protected area is the Dee (East) Shellfish Water Protected Area which lies 10.8 km from Area 393. This is home to an Marine Stewardship Council (MSC) certified sustainable cockle fishery.

<sup>6</sup> [Recreational Sea Angling - IFCA North West](#)

### 5.5.3 Possible environmental effects

Dredging within Area 393 has the potential to affect commercial and recreational fisheries through a range of pathways. The following sections identify which likely environmental effects, with respect to commercial and recreational fisheries, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in'). At this stage, there are no potential pathways proposed to be 'scoped out'.

#### Scoped in

Dredging within Area 393 has the potential to affect commercial and recreational fisheries through the following impact pathways:

- Potential disruption of fisheries activities due to vessel movements;
- Potential for fishing gear damage; and
- Potential impacts to fishing activities due to potential changes to fish stocks and distribution.

Details of the indirect impacts on commercial and recreational fisheries in relation to fish and shellfish ecology including impacts on critical habitats such as spawning, nursery and overwintering grounds are covered in Fish and Shellfish Ecology (Section 5.4.3). Reference should also be made to Benthic Ecology (Section 5.4.3).

### 5.5.4 Further work required for EIA

The following key elements of work will be required as part of the EIA:

- Detailed review of existing available information and data (see below the available data sources to be used);
- Consultation with local commercial fishermen and recreational angling clubs or operators, as well as relevant staff at the Welsh Government and North Western Inshore Fisheries and Conservation Authority (NWIFCA); and
- Assessment of the effects of dredging on the identified impact pathways.

The following information sources are to be consulted:

- Commercial data:
  - MMO catch data by International Council for the Exploration of the Sea (ICES) rectangle (35E6);
  - MMO vessel registry;
  - Welsh Government data;
  - NWIFCA data;
  - Vessel management system (VMS) and NRW/MMO surveillance data;
  - Fisheries Management Plans (FMP) evidence reviews;
  - ICES benchmark assessment for bass (2023/24); and
  - Consultation with fishermen, Welsh Government and NRW.
- Recreational data:
  - Angling Trust;
  - UK Government Sea Angling in the UK report (2019); and
  - North Western IFCA's recreational data.

## 5.6 Commercial and recreational navigation

This section sets out the proposed scope of the ES chapter that will report the findings of the commercial and recreational navigation assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.6.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on commercial and recreational navigation will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation and guidance, including:

- UK MPS (HM Government, 2011);
- WNMP (Welsh Government, 2019);
- The Port Marine and Facilities Safety Code (DfT, 2025);
- A Guide to Good Practice on Port and Marine Facilities (MCA, 2025); and
- International Maritime Organization (IMO) Revised Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule making process (IMO, 2018).

### 5.6.2 Description of the existing environment

Area 393 is located in Welsh Waters in Liverpool Bay, approximately 12 km north of Rhyl. The northern part of Area 393 lies within the jurisdiction of the Port of Liverpool Statutory Harbour Authority (SHA) area. Mersey Docks and Harbour Company (MDHC) are the Competent Harbour Authority.

The main navigational features in the vicinity of Area 393 are the International Maritime Organisation (IMO) adopted Liverpool Bay Traffic Separation Scheme (TSS), Round 1 and 2 offshore wind farms, oil and gas industry infrastructure and marine cables. The TSS lies approximately 4 km to the north of the Licence Area and is designed to separate vessels heading into and out of the Port of Liverpool. Vessels heading towards the Port travel eastwards to the south of the TSS closest to the existing Licence Area. There is a designated anchorage area which overlaps with the Area 393 boundary to the east<sup>7</sup>.

Within Liverpool Bay, commercial vessel activity continues year-round and relates to a range of sectors. A large amount of vessel traffic is related to offshore wind with Crew Transfer Vessels (CTVs) operating for the Gwynt y Môr, North Hoyle and Rhyl Flats and Burbo Bank Offshore Wind Farms (ABPmer, 2021). The Douglas Oil Field is located 3 NM northwest of the dredging area. The IMO-adopted area to be avoided around the field should only be entered by authorised vessels to access the Douglas Oil Field. Western High Voltage Direct Current cable route (National Grid and Scottish Power) lies around 5 km north of Area 393. There are also active marine disposal sites including Mostyn Deep (11 km south east of Area 393), and Site Z (10 km north east of Area 393).

The main shipping flows are generally east to west to and from ports in Liverpool/Mersey via the Queens Channel. Most of this traffic keeps to the north of the Licence Area. There is also traffic to the south associated with the Port of Mostyn which is currently mostly wind farm related.

The North Wales coast is a relatively popular area for recreational sailing, supporting a number of designated sailing routes, marinas, slipways and harbours. There is only one route which passes through the Licence Area which is a light-use route from Anglesey/Bangor to a navigation point to the east of the Licence Area with vessels then entering the Queens Channel to the Mersey. Two medium-use routes pass to the north and south of the Licence Area. There are also several recreational diving sites in Liverpool Bay, although the proposed Licence Area is not considered to be important for recreational diving.

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<sup>7</sup> Wales Marine Planning Portal (source: <https://lle.gov.wales/apps/marineportal/>)

### 5.6.3 Possible environmental effects

Dredging within Area 393 has the potential to affect commercial and recreational navigation through a range of pathways. The following sections identify which likely environmental effects, with respect to commercial and recreational navigation, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in') and those which will not be assessed further (i.e. considered not likely to be significant and therefore 'scoped out').

#### Scoped in

Dredging within Area 393 has the potential to affect commercial and recreational navigation through the following impact pathways:

- Potential for vessel collision whilst working in the Licence Area;
- Potential for vessel collision whilst on transit to and from the Licence Area; and
- Displacement of vessels from Area 393 during the dredge activity.

The potential risks associated with encountering unexploded ordnance (UXO) will be considered specifically under Marine Archaeology and Cultural Heritage (see section 5.7).

#### Scoped out

The following impact pathways are proposed to be scoped out of the EIA:

- **Water quality impacts from pollutants resulting from accidents, incidents or spillages:** Potential risks associated with any vessel accidents, incidents or collisions will be minimised through existing compliance with the International Safety Management Code which became mandatory with the adoption of the International Convention for the Safety of Life at Sea (which entered into force in 1980).

### 5.6.4 Further work required for EIA

This section sets out the key elements of work which will be required as part of the EIA.

Key information on navigation within the study area will be collected from public domain datasets e.g. Department for Transport (DfT) shipping and port statistics and the most recently released EMODnet shipping density Automatic Information Systems (AIS) data which will identify the intensity of sea area usage. No analysis of transit tracks or individual vessel type information will be undertaken for this licence renewal.

Data will be requested from aggregate companies regarding the nature of vessel movements to, at and from other aggregate licence areas. Further relevant information sources include:

- EMODnet shipping density Automatic Information Systems (AIS) data (previously analysed datasets);
- Military practice and exercise (and other relevant) data layers;
- Data from various ports (and authorities);
- Data from DfT;
- Licensed marine disposal sites; and
- Royal Yachting Association (RYA) indicative cruising routes and sailing areas.

Consultation will also be carried out with the Maritime and Coastguard Agency (MCA), Chamber of Shipping, the RYA and Statutory Harbour Authorities that overlap and are adjacent to Area 393.

## 5.7 Marine archaeology and cultural heritage

This section sets out the proposed scope of the ES chapter that will report the findings of the marine archaeology and cultural heritage assessment, with regards to potential effects as a result of the proposed aggregate dredging. Wessex Archaeology has been commissioned to undertake the marine archaeology and cultural heritage assessments for the Area 393 EIA (and to prepare this section of the Scoping Report).

### 5.7.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on marine archaeology will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation, and guidance, including:

- Historic Environment (Wales) Act 2016;
- The Ancient Monuments and Archaeological Areas Act 1979;
- MCAA;
- The Merchant Shipping Act 1995;
- The Protection of Wrecks Act 1973;
- The Protection of Military Remains Act 1986;
- UK MPS 2011;
- Planning Policy Wales 2017;
- Future Wales – The National Plan 2040 (Welsh Government 2021);
- WNMP (Welsh Government 2019);
- Caring for Coastal Heritage (Cadw 1999);
- Conservation Principles of the Sustainable Management of the Historic Environment in Wales (Cadw 2011);
- Managing the Marine Historic Environment of Wales (Cadw 2020);
- British Marine Aggregate Producers Association (BMAPA) and The Crown Estate (TCE) ‘Good Practice Guidance: Extraction by Dredging of Aggregates from England’s Seabed’ (BMAPA and TCE, 2017);
- BMAPA and English Heritage ‘Marine Aggregate Dredging and the Historic Environment: Assessing, evaluating, mitigating, and monitoring the archaeological effects of marine aggregate dredging (BMAPA and English Heritage 2003);
- Marine Aggregate Industry (MAI) Protocol for the reporting of finds of archaeological interest (BMAPA *et al.*, 2005); and
- Relevant local policy.

### 5.7.2 Description of the existing environment

#### Previous work

The previous marine licence application was supported by an ES produced in 2012 (ERM, 2012), with a baseline from desk-based sources and archaeological assessment of geophysical survey datasets completed by Wessex Archaeology (2011). Area-specific palaeolandscape assessment through a geoarchaeological assessment of vibrocore logs and sub bottom profiler (SBP) datasets were completed as part of the 2011 works, and a wider regional assessment was completed covering the whole of Liverpool Bay as part of West Coast Palaeolandscapes Project (Fitch *et al.*, 2013). Results of these assessments have been synthesised in Figure 9.

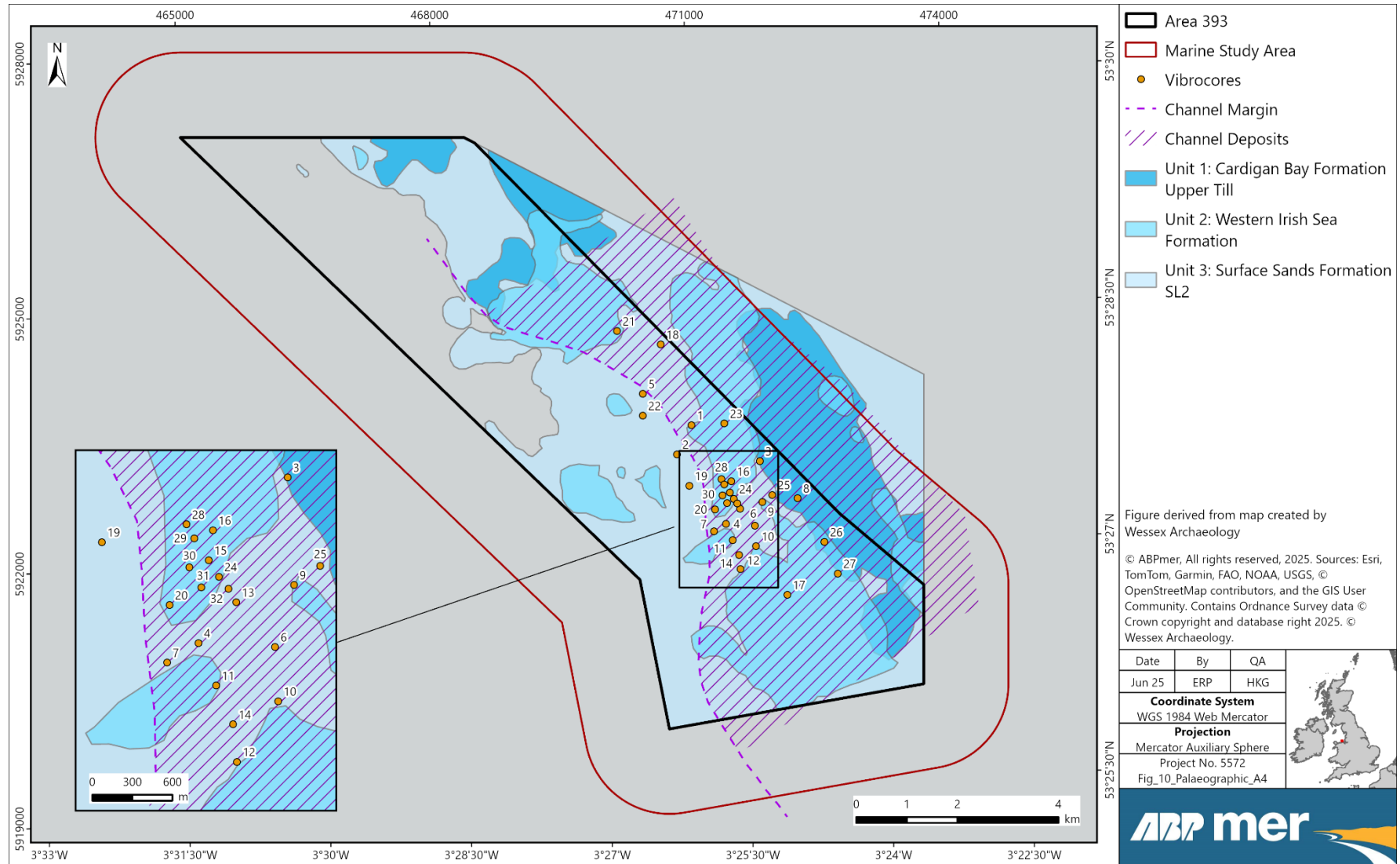


Figure 9 Palaeolandscapes assessment of the study area

Archaeological assessment of the monitoring geophysical surveys (2014, 2015, 2017, 2022) was completed throughout the extraction of aggregates by MarineSpace and MSDS (MarineSpace, 2014; 2016; 2018b; MSDS, 2019; 2023). These assessments investigated the potential maritime and aviation archaeology seabed features within Area 393 and a buffer zone defined by each report. Results of these assessments and an up-to-date data request have been synthesised in Figure 10.

Extensive marine archaeological work has been undertaken through the development of the various offshore wind farms along the North Welsh coast as well as those further north and east in English waters and within the marine aggregates extraction licence Area 457 to the north.

The historic seascape characterisation of Liverpool Bay was covered by a pilot project by Wessex Archaeology (Wessex Archaeology, 2006), and the North West Inshore and Offshore Marine Plans included historic seascape characterisation of the area by LUC (LUC, 2018).

### Existing environment

Marine archaeology receptors will be considered against the following four categories:

- Submerged prehistory: land surface with evidence of human activity, including now-submerged landscape features, artefacts, sites and find-spots that date from the earliest occupation;
- Maritime sites: vessel remains, wreckage and submerged vessel/cargo debris;
- Aviation sites: all military and civilian aircraft crash sites and related wreckage; and
- Historic Seascape Character

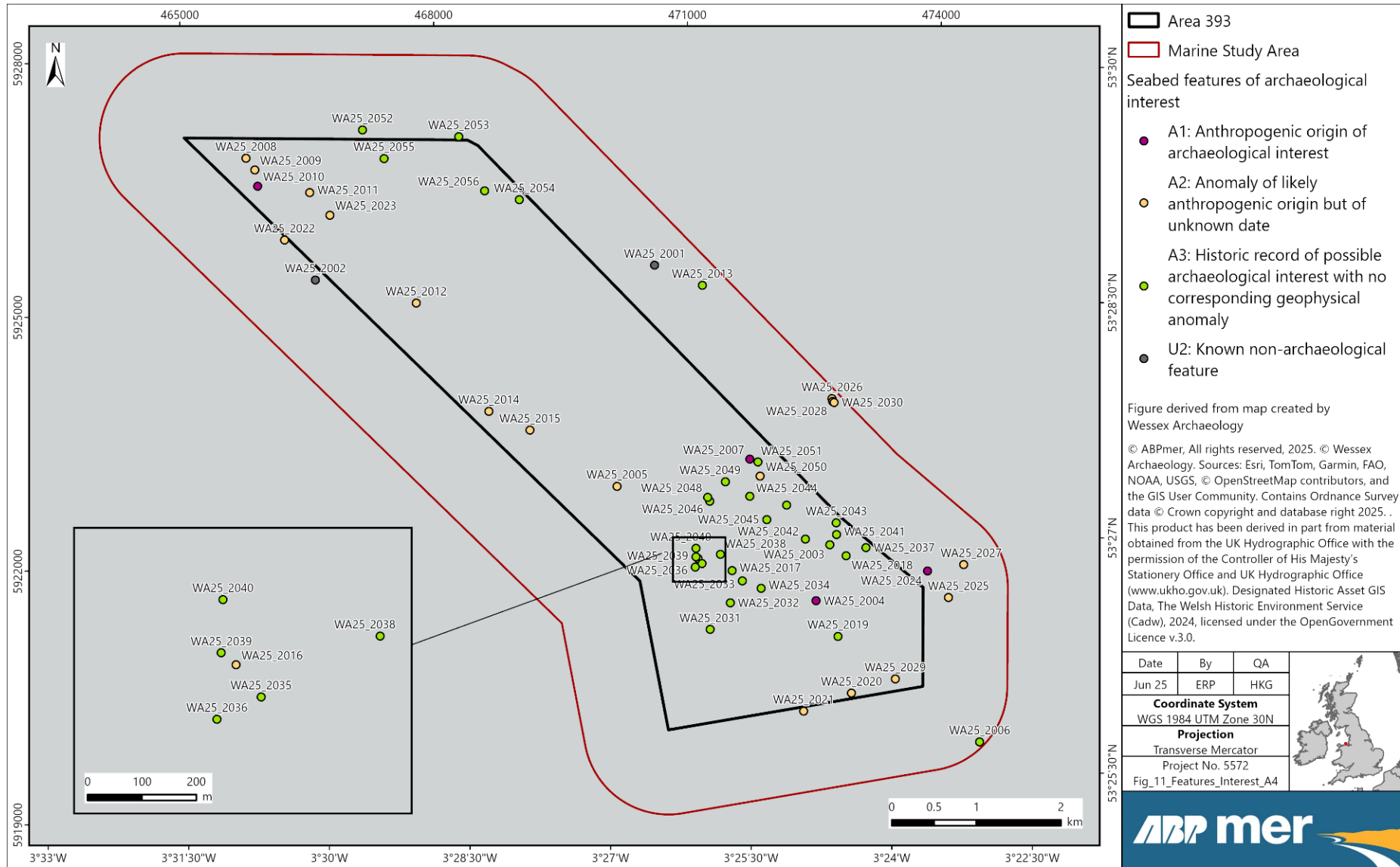


Figure 10. Site location of known archaeological features of interest in the vicinity of Area 393

## Submerged prehistory

There is varied potential for prehistoric archaeology within this area as a whole, as outlined in previous studies. The regional assessment (Fitch *et al.*, 2013) identified a braided palaeochannel, thought to be that of the palaeo-Dee, *circa* 15 miles to the east of the Study Area, while the geoarchaeological assessment of SBP and vibrocore datasets found that the overlying seabed sediments were of low geoarchaeological potential. These studies identified one palaeochannel below the overlying seabed sediments within the eastern half of the Licence Area, running north-west (Figure 9). The assessment also found that there were potential in-situ peat deposits within the Licence Area, with one vibrocore (31) containing a peat horizon 17 cm thick at 3 m below the seabed surface. Both of these features were considered of high potential for palaeolandscapes reconstruction data (Wessex Archaeology, 2011). These deposits were 2 -3 m below the seabed surface at the time of investigation (2011) and so had not been damaged up to that point, being covered by surface deposits of limited geoarchaeological potential. No further archaeological assessment of submerged prehistory has been completed since this assessment.

## Maritime and aviation sites

### Results from Assessment of Geophysical Survey Datasets combined with documentary sources data searches

The multiple geophysical assessments have covered both partial sections of the Licence Area (generally the active dredge areas in the north-east and south of the Licence Area for the 2014 – 2022 datasets) or the whole Licence Area plus some additional buffer (2011 dataset).

As a summary, a total of 41 anomalies and/or documentary records related to known or possible maritime archaeology have been identified within the Licence Area, and a further 15 within the wider Study Area. These combine the results of the UK Hydrographic Office (UKHO), National Monument Record of Wales (NMRW) and Heneb: Clwyd-Powys Archaeology (H:CPA) with the previous archaeological assessment results. The Licence Area total includes:

- One known wreck location, identified (Wessex Archaeology, 2011) as A1 (an anomaly of anthropogenic origin of archaeological interest), which was also present in the NMRW dataset;
- Two known wreck locations identified as being of High archaeological potential (MSDS, 2023), both of which were in the UKHO and NMRW datasets;
- 11 anomalies assessed (Wessex Archaeology, 2011) as A2 (Uncertain origin of possible archaeological interest), nine of which were also present within the NMRW dataset. One of these, 'WA25\_2005' interpreted as a possible ballast mount, was also present in the UKHO dataset;
- One anomaly assessed as being of Medium archaeological potential (MSDS, 2023) which had potential to be of archaeological origin;
- 26 anomalies assessed as being of Low archaeological potential (MSDS, 2023), which included modern pipes and likely geological material; and
- One documentary record with no matching geophysical anomaly, WA25\_2019, classified as an A3 by Wessex Archaeology (2011), described in the NMRW as the recorded position of the wreck of the *Albion*, a Mersey flat lost in April 1887 with a cargo of gravel.

The study area total includes:

- One known wreck location, identified (Wessex Archaeology, 2011) as A1, which was not present in any documentary source dataset;
- Seven anomalies assessed as A2 (Wessex Archaeology, 2011), two of which were also present within the NMRW dataset;

- Two anomalies assessed as being of Low archaeological potential (MSDS, 2023);
- Two documentary records record with no matching project specific geophysical anomaly, classified as an A3 by Wessex Archaeology (2011), one, WA25\_2006, listed in both the UKHO and NMRW datasets as a wreck, and the other, WA25\_2013, listed in the NMRW as the recorded position of the wreck of the *Bat* a Mersey flat lost in September 1893 with a cargo of granite chippings; and
- Two anomalies assessed (Wessex Archaeology, 2011) as being U2 (Known non-archaeological feature), both of which were modern dropped anchors which were also in the UKHO dataset.

The 2011 dataset identified a further 37 historic records of possible archaeological interest which were listed as fishermen's fasteners, largely within English Waters to the northwest of the Licence Area. Consultation with Historic England for previous Liverpool Bay projects identified that these fishermen's fasteners were particularly common within the historic records for Liverpool Bay due to the Southport fleet reporting them frequently, but their positioning was unreliable and they were not considered to be of significance. These A3 records are therefore not recommended for further study and have not been mapped within Figure 10, with the up-to-date data searches within documentary sources being more reliable for historic records of wrecks, obstructions and other features of archaeological potential.

The 2023 assessment of geophysical survey data summarised the material covered in the previous reports, which all covered the two active dredge areas rather than the whole Licence Area. It brought forward the two 50 m AEZs for the A1 probable wrecks from the 2011 results (WA25\_2010 and WA25\_2024), two further 50 m AEZs for anomalies rated as of high archaeological potential in the 2014 and 2016 MarineSpace reviews (WA25\_2004 and WA25\_2007) and a 25 m AEZ around a newly identified anomaly assessed as of medium archaeological potential in the 2023 dataset (WA25\_2050).

As the most recent geophysical survey dataset to be assessed (although it only covered the active dredge areas within Area 393 rather than the whole Licence Area), the MSDS (2023) assessment identified two anomalies assessed as high potential (both wrecks), one anomaly of medium potential and 28 of low potential, including a likely dredge pipe previously identified in the 2014, 2016 and 2018b reports by MarineSpace. The low potential anomalies included one tyre, three modern pipes (including the dredge pipe discussed above), two pieces of debris, 11 pieces of potential debris, one section of fishing gear, two sections of chain, cable or rope and eight anomalies that were assessed as likely to be geological (boulders etc.).

### Results from MAI Protocol

Two finds have been reported through the Marine Aggregate Industry (MAI) protocol for the area: a leg bone from a sheep or goat dating to the Roman – Medieval periods and a wooden block sheave, both of which were recovered in 2018 by the vessel *City of Cardiff*. The exact location of recovery for both finds is not known, and a position within the centre of the Licence Area has been assigned. As this is arbitrary these finds have not been mapped on Figure 10. No artefacts which might be demonstrative of exposed palaeolandscape features have been recovered through the MAI protocol.

### Maritime Archaeology Potential

There is potential for the discovery of undocumented shipwrecks and other maritime materials dating from as early as the Mesolithic (Wessex Archaeology, 2011) through to the modern period, with greater potential from the medieval period onward. The area of Hilbre Swash and the other sandbanks along the coast have long been noted as a navigational hazard for ships approaching or leaving the Mersey and Dee ports (Brownhill, 1928).

### Aviation Archaeology Potential

One record of an aircraft crash has been identified, to the north of Area 393 within the wider Study Area. This is the record for a Hawker Henley Mk I target tug aircraft that was recorded as ditching in the sea

after its engine cut out in 1940. This position is unconfirmed and aircraft crash records have generally poor accuracy, and so this has not been mapped. More generally the wider Liverpool Bay area, while not noted as an area of high potential for aircraft crashes due to its distance from the main areas of First World War and Second World War combat, does have *circa* 10 entries for aircraft crashes (Wessex Archaeology, 2008) and reports of *circa* 50 air/sea rescue missions during the Second World War (Air Ministry, 1952).

## Setting

Setting is defined as 'the surroundings in which a heritage asset is understood, experienced and appreciated... Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral' (Planning Policy Wales, 2017). Currently, there is no specific guidance regarding the assessment of setting for underwater archaeological and cultural heritage assets. However, Cadw's Setting of Heritage Assets in Wales provides general guidance, largely applicable to terrestrial sites, and notes that 'setting is important to the way in which historic assets are understood, appreciated and experienced, and contributes to their significance' (Cadw, 2017). With regards to significance for heritage policy, Planning Policy Wales notes that 'setting is not a historic asset in its own right but has value derived from how different elements may contribute to the significance of a historic asset' (Planning Policy Wales, 2017).

The setting of the known archaeological receptors within the Licence Area should be taken into consideration, and any potential impact on it assessed. It is not possible to ascertain the setting of currently unidentified marine heritage assets, where limited information is known, for example wrecks that have not been identified or characterised to determine their period of build, use or loss. Similarly, setting cannot be assessed for geophysical anomalies of archaeological potential or potential sites that have not yet been discovered.

## Historic Seascape Character

In accordance with the European Landscape Convention, 'landscape' can be defined as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors' (Council of Europe 2000, Article 1). The term 'seascape' can be defined as a subset of 'landscape', and has 'an area of sea, coastline, and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and / or human factors' (ibid.).

Seascape assessment reflects the holistic approach to landscape of the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments and cover the offshore environment to beyond the territorial limit (12 NM). Historic Seascape Characterisation (HSC) assessment is the identification and interpretation of the historic dimension of the present day coastal and marine environment (LUC, 2018).

The baseline summary for character of the historic seascape within the marine study area was assessed using the results of Land Use Consultants' (LUC) Historic Seascape Characterisation (HSC) for the North West Inshore and Offshore Marine Plans (2018), alongside the results of Wessex Archaeology's pilot project on the HSC of Liverpool Bay (Wessex Archaeology, 2006). This information has been collated alongside the seven other existing HSC implementation projects (undertaken between 2008 and 2015) into a single national database. The method assesses and defines areas with HSC types that promote an understanding of historic trends and processes, to inform the sustainable management of change over time. This is achieved by addressing the multi-level character of the sea, by splitting the marine zone into five tiered levels: the coastal area, the sea surface, the water column, the sea floor, and the subsea floor. The characterisation is GIS based, enabling key characteristics to be identified.

When the HSC was undertaken in 2018, it characterised the study area as having the following elements:

- Fishing – comprising bottom trawling and demersal trawling, based on data from historic charts, documentary sources, Cefas, regional IFCA's, and JNCC;
- Navigation – comprising navigation routes and hazards, primarily derived from modern and historic charts; and
- Industry – in the form of aggregate extraction based on modern and historic charts.

It should also be noted that one of the case studies undertaken for the project sought to demonstrate the roles of HSC in informing the marine aggregates dredging licensing process (Oxford Archaeology 2011; 43). This case study explained the necessity for aggregate extraction, then actively encouraged by the UK Government.

### 5.7.3 Possible environmental effects

Dredging within Area 393 has the potential to affect marine archaeology through a range of pathways. The following sections identify which likely environmental effects, with respect to marine archaeology, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in').

At this stage, there are no potential pathways proposed to be 'scoped out'. While the potential for previously unknown *in situ* maritime and aviation archaeology may be reduced within the area already dredged due to the removal of material, there is still some potential for previously covered sites to become uncovered and identified within a previously dredged area.

#### Scoped in

Dredging within Area 393 has the potential to affect marine archaeology through the following impact pathways:

- Potential for direct damage to the marine archaeological resource (through action of the draghead) – the action of the draghead on and beneath the seabed may cause direct damage/destruction/dispersal to marine archaeological receptors in these locations. Dredging activities may also change the seabed bathymetry which can subsequently impact the sediment transport regimes around archaeological sites, disturbing relationships between archaeological artefacts and their contexts, and potentially exposing such material to increased erosion or corrosion;
- Potential for indirect damage to the marine archaeological resource through the following:
  - Overspill and screening – re-deposition of sediments following settling of sediment plumes caused during the overspill and screening processes may contribute to the preservation of marine archaeological receptors by increasing the layer of sediment that covers and protects the receptors; and
  - Changes in sedimentation/erosion – changes to currents can cause changes to sedimentation and erosion regimes. Erosion can lead to degradation of exposed receptors, while sedimentation can increase the layer of sediment that covers and protects the receptors.

An additional consideration when assessing the presence of First World War and Second World War vessels and aircraft may be the potential for the presence of UXO remaining on board. A statement on this will be included in the ES.

### 5.7.4 Further work required for EIA

This section sets out the key elements of work which will be required as part of the EIA. The assessment will focus on the three main assessment themes: Submerged prehistory; Maritime archaeology; and Aviation archaeology. The key objectives of the study will be:

- To provide an overview on the historic environment in the study area based on existing archaeological records and secondary sources;
- To highlight known sites that may be impacted by the proposal with particular reference to located marine sites and recorded shipping losses;
- To summarise the potential for the presence of hitherto unknown sites that may be impacted by the proposal;
- To comment on the importance of known and potential sites;
- To set out the statutory, planning and policy context relating to the historic environment in the study area; and
- To assess the effects of dredging on the identified archaeological pathways.

An archaeological Desk Based Assessment and Gazetteer will also be produced and appended to the ES. The following data sources will be consulted / interpreted:

- Previous reports and analyses of the marine archaeology of the study area, including:
  - The 2012 ES (ERM, 2012) which included a desk-based assessment baseline and archaeological assessment of geophysical and geotechnical survey datasets by Wessex Archaeology (2011);
  - Archaeological assessment of 2014, 2016, 2018 and 2022 survey data (sidescan sonar and multibeam bathymetry) obtained for the dredge area and a buffer around it as part of the monitoring process for Area 393 (MarineSpace, 2014; 2016; 2018b, MSDS, 2019; 2023);
- Records held by the UK Hydrographic Office (UKHO), the NMRW and H:CPA;
- Records of shipping and aircraft casualties held by the NMRW; and
- Records of isolated finds from Area 393, including those reported through the BMAPA/MAI Protocol and relevant assessments, research, and secondary sources.

Repeated sidescan and multibeam bathymetry surveys of the active dredge areas of Area 393 have been undertaken as part of the regional geophysical monitoring programme from 2011 to 2023. A rapid summary of the results for the Licence Area and, where significant, the wider study area have been included within this scoping report, although where a later assessment has changed or removed an earlier anomaly, only the updated location has been included.

#### Standards statement

The methodology adopted reflects best practice in carrying out archaeological desk-based assessments, as set out by the Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-based Assessment (CIfA, 2014, updated 2020); Wessex Archaeology is a Registered Organisation of the CIfA, and fully endorses its Code of Conduct. Wider industry best-practice will also be followed, including the publication Marine Aggregate Dredging and the Historic Environment (BMAPA and English Heritage, 2003). The latter document aims to ensure the effective and practical consideration of the historic environment in the licensing of marine aggregate extraction and elaborates on the guidance provided in the Code of Practice for Seabed Developers produced by the Joint Nautical Archaeology Policy Committee (JNAPC, 2006).

## 5.8 Coast protection and flood defence

This section sets out the proposed scope of the ES chapter that will report the findings of the coastal protection and flood defence assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.8.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on flood risk receptors will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation and guidance, including:

- The Water Framework Regulations 2017;
- Flood and Water Management Act 2010;
- Great Ormes Head to Scotland Shoreline Management Plan (SMP) 22 (Coastal Group North West and North Wales, SMP unit 11A Llandudno to Southport (11A)) (Environment Agency, 2025);
- The National Strategy for Flood and Coastal Erosion Risk Management in Wales (Welsh Government, 2020); and
- Relevant local policy.

### 5.8.2 Description of the existing environment

Shoreline Management Plans (SMPs) are non-statutory documents intended to both inform and be supported by the statutory planning process. The intention of an SMP is to develop a broad coast defence strategy that is technically, economically and environmentally sustainable. The coastal management policies for Liverpool Coastline near Area 393 are detailed within the Llandudno to Southport SMP (North West North Wales Coastal Group, 2025). Management approaches vary along the coastline within this area. Barkby Beach to Point of Ayr (11A4.4) implements a 'Managed Realignment' plan and Royal Liverpool Golf Club to Hilbre Point (Stanley Road) (11A5.10) implements a 'No Active Intervention' plan, whilst Rhyl Golf Links to Barkby Beach (Prestatyn) (11A4.3), Rhyl Golf Links (11A4.2), Clwyd Estuary to Rhyl Golf Links (11A4.1) and Hilbre Island (11A5.11) all implement a 'Hold the Line' approach (Defra, 2025).

### 5.8.3 Possible environmental effects

Dredging within Area 393 has the potential to affect coast protection and flood defence through a range of pathways. The following sections identify which likely environmental effects, with respect to coast protection and flood defence, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in') and those which will not be assessed further (i.e., considered not likely to be significant and therefore 'scoped out').

#### Scoped in

Dredging within Area 393 has the potential to affect coast protection and flood defence through the following impact pathways:

- Potential for maintaining source of aggregate for coastal defences and beach nourishment.

It is feasible that the type of sediment extracted from Area 393 can be used for beach nourishment. Therefore, the potential impact pathway (benefit) for maintaining a source of aggregate for coastal defences and beach nourishment has been scoped in.

## Scoped out

The following impact pathways are proposed to be scoped out of the EIA:

- Potential for changes to wave height/exposure to affect coastal protection/flood defence.

A change in wave energy along a coastline over the long term could change the potential for increased coastal erosion, undermining coastal defence infrastructure (leading to increases in maintenance expenditure and/or a requirement for beach recharge schemes). Changes in wave heights and/or sediment transport pathways due to the cumulative effects of aggregate extraction from all licence areas in the region could impact the adjacent coastline. However, the previous CIS (HR Wallingford, 2011), concluded that dredging at Area 393 would not have a significant impact on wave or tidal flow conditions at the coast (see Section 5.2.3). Consequently, even with removal of the whole resource (which has not happened), there would be an insignificant impact on the coastline. Additionally, these studies concluded there would be no significant impacts on the coastline due to changes in sediment transport pathways (see Section 5.2.3). Finally, Area 393 is more than 10 km away from other production agreements areas or exploration and option areas in the region and therefore too far for cumulative impacts to conceivably occur (see Section 5.2.3). This pathway has therefore been scoped out of further assessment.

### 5.8.4 Further work required for EIA

To inform the EIA, the following will be undertaken:

- Consider information contained in previous Area 393 reports;
- Provide consideration of future climate change impacts in the region; and
- Assess the effects of dredging on the identified pathway.

The following data sources will be consulted:

- Llandudno to Southport SMP.

## 5.9 Infrastructure and other marine users

This section sets out the proposed scope of the ES chapter that will report the findings of the infrastructure and other marine users assessment, with regards to potential effects as a result of the proposed aggregate dredging.

### 5.9.1 Legislation, policy and guidance position

The potential effects of the proposed aggregate dredging on infrastructure and other marine users will be considered in the respective topic-specific ES chapter, which will cross-reference, as appropriate, relevant policy, legislation and guidance, including:

- WNMP (Welsh Government, 2019);
- UK MPS (HM Government, 2011);
- Great Ormes Head to Scotland Shoreline Management Plan (SMP) 22 (Coastal Group North West and North Wales, SMP unit 11A Llandudno to Southport (11A)) (Environment Agency, 2025); British Marine Aggregate Producers Association (BMAPA) 'Marine Aggregate Dredging and the Coastline: A Guidance Note' (BMAPA, 2013);
- BMAPA and TCE's 'Good Practice Guidance: Extraction by Dredging of Aggregates from England's Seabed' (BMAPA and TCE, 2017);
- Flood and Water Management Act 2010; and
- Relevant local policy.

## 5.9.2 Description of the existing environment

There are a range of interactions between human activities and marine assets within Liverpool Bay. As noted in Section 5.6, the region is busy with regard to navigation, both inshore of Area 393 with many ports harbours and marinas along the coastline, and offshore with windfarms, oil and gas, cables and pipelines and marine disposal sites.

There are four windfarm sites currently operating or under construction in the south of Liverpool Bay in the vicinity of the Licence Area: Gwynt y Môr (immediately west of Area 393); North Hoyle (immediately south); Rhyl Flats; and Burbo Bank.

There are several cables and pipelines which cross Liverpool Bay, including the Western High Voltage Direct Current cable route (National Grid and Scottish Power) lies around 5 km north of Area 393. There are also cables associated with each of the wind farm developments listed above.

Other infrastructure includes the Douglas Oil Field which is located 3 NM northwest of the dredging area. There are active marine disposal sites including Mostyn Deep (11 km south east of Area 393), and Site Z (10 km north east of Area 393). There is also another Aggregate Dredging Licenced Area 11 km north of Area 393 (Westminster Gravels Ltd).

The Port of Mostyn is the closest port to the Licence Area, approximately 14 km to the southeast on the Welsh shore of the Dee Estuary. There is a military area, the Altcar firing range, located at Hightown on the Merseyside coast north of Liverpool (ERM, 2012). The range is approximately 20 km from Area 393.

## 5.9.3 Possible environmental effects

Dredging within Area 393 has the potential to affect infrastructure and other marine users through a range of pathways. The following sections identify which likely environmental effects, with respect to infrastructure and other marine users, will be assessed in the EIA (i.e. considered likely significant and therefore 'scoped in'). At this stage, there are no potential pathways proposed to be 'scoped out'.

### Scoped in

Dredging at Area 393 has the potential to affect infrastructure and other users through the following impact pathway:

- Potential impacts of physical processes changes on marine and land-based infrastructure.

## 5.9.4 Further work required for EIA

The following key elements of work will be required as part of the EIA:

- The following information sources are to be considered to characterise the baseline (amongst others): Relevant data layers (e.g. cables, pipelines, renewables, dredging activity and lease areas); and
- Assessment of the effects of dredging on the identified pathway.

## 5.10 Cumulative/in-combination assessment

As noted in Section 4.2.6, a cumulative impact and in-combination assessment will also be undertaken, to consider the effects of the proposed marine aggregates dredging alongside those arising from other plans, projects, and activities. This will be presented in a separate ES chapter.

The assessment of these impacts will involve a desk-based review of relevant marine licence, planning and development consent applications within close proximity of the proposed activity. For each potentially relevant planned or recently consented development or activity, a brief description will be provided, and the potential for cumulative and/or in combination impacts reviewed. Those which are scoped in will then be included in the assessment.

For the in-combination element of the scoping, zones of influence as determined by mobile features of nearby/overlapping designated sites (i.e. seabirds and marine mammals) which could be impacted by dredging in Area 393 and other activities, developments and plans, will also be included. For the ornithology element, the mean maximum foraging ranges (+ 1 Standard Deviation (SD)), as reported by Woodward *et al.* (2019) will be applied in the scoping of overlap with relevant projects, plans or activities.

It is envisaged that the in-combination and/or cumulative impacts via the following pathways/activities will be considered:

- Ongoing and proposed aggregate extraction in other Areas;
- Ongoing commercial and recreational fishing;
- Ports, navigation and shipping;
- Ongoing recreation and tourism;
- Disposal sites;
- Offshore wind farms; and
- Relevant nearby pipelines and cables.

We would be grateful if the NRW MLT, its advisors and consulted government bodies could, as part of the consultation undertaken for this Scoping Report, highlight those plans, projects or activities which they consider to have particular potential for cumulative/in-combination effects with the proposed renewal of a dredging activity.

With regard to receptors, impacts on the following would be assessed for some of the above pathways/activities:

- Physical processes;
- Water and sediment quality;
- Nature conservation;
- Benthic ecology;
- Fish and shellfish;
- Marine and coastal ornithology;
- Commercial and recreational fisheries;
- Commercial shipping and recreational navigation;
- Marine archaeology and cultural heritage;
- Coastal protection and flood defence; and
- Infrastructure and other marine users.

A matrix table will be presented in the ES to highlight which pathways and receptors are to be assessed; thereafter, the assessment itself will be undertaken.

## 6 Summary

Following this Scoping Report, a number of environmental topics and impact pathways are proposed to be either 'scoped in' (i.e. require further assessment as part of the EIA) and/or 'scoped out' (i.e. do not require further assessment as part of the EIA). The findings for each topic and the potential impact pathways that are proposed to be scoped in and out of the EIA are summarised in Table 14.

The relevant environmental topic sections of the report in Section 5 provide further detail on the justification for, and approach to, the further assessment work that will be undertaken as part of the EIA.

Furthermore, potential cumulative effects of the proposed aggregate dredging alone and as a result of other plans, projects and ongoing activities will be assessed for each topic that has been scoped into the EIA (Section 4.2.6; 5.10). A note on transboundary impacts will also be included.

In addition to the EIA, which will be documented in the ES, a marine plan conformance assessment, an HRA and a consultation log will be provided as appendices to the ES.

**Table 14. Summary of ‘scoped in’ (orange) and ‘scoped out’ (green) topics and potential impact pathways, and summary of proposed further work.**

| Topic   | Potential Impact Pathways  | Scoped In/ Out of EIA | Proposed Further Work  |
|---|--|-----------------------|--|
| <b>Physical Processes (Section 5)</b>           | Potential changes to the tidal regime  | In                    | <ul style="list-style-type: none"> <li>▪ A review of physical processes at Area 393, and the surrounding region, based on existing available information, ongoing monitoring surveys and reporting;</li> <li>▪ A review and interpretation of existing Coastal Impact Studies (CISs) and associated plume modelling studies;</li> <li>▪ Assessment of the identified physical processes impact pathways; and</li> <li>▪ Assessment of potential cumulative effects.</li> </ul> <p>No dedicated CIS is to be undertaken, as sufficient modelling studies are available for the Area; see Section 5.2.4 for comprehensive justification.</p> |
|   | Potential changes to the wave regime   | In                    |  |
|   | Potential changes to the sediment transport  | In                    |  |
|   | Increased SSC and potential sedimentation over the extent of the dredge plume  | In                    |  |
|   | Potential effects on bedforms across the wider study area  | In                    |  |
|   | Consideration of impact pathways in conjunction with climate change effects  | In                    |  |
|   | Potential reduction in beach volume from ‘draw-down’ of material into the dredged areas  | Out                   |  |
|   | Potential effects on the coastline due to changes in wave height and tidal currents  | Out                   |  |
|   | Potential effects on the coastline due to changes in sediment transport pathways   | Out                   |  |
|   | Potential cumulative effects with ongoing dredging in other sites within the region  | Out                   |  |
| <b>Water and Sediment Quality (Section 5.3)</b> | Potential changes to SSC   | In                    | <ul style="list-style-type: none"> <li>▪ A review of water quality conditions at Area 393, based on existing available information and monitoring data; and</li> <li>▪ Assessment of the identified pathways for water quality.</li> </ul> <p>Impacts related to vessel movement and risks risk of water quality impacts from accidents and incidents</p>  |
|   | Potential changes to dissolved oxygen concentrations as a result of changes to SSC   | In                    |  |
|   | Changes to chemical water quality as a result of potential sediment-bound contaminants being released during dredging operations | Out                   |  |
|   | Redistribution of sediment-bound contaminants during dredging operations   | Out                   |  |

| Topic  | Potential Impact Pathways  | Scoped In/ Out of EIA | Proposed Further Work  |
|--|--|-----------------------|--|
|  | Changes to levels of contaminants in water (including accidental spillages) during dredging operations               | Out                   | will be considered as part of the navigation impact assessment.<br><br>A WFD assessment is not considered to be required.  |
| <b>Nature Conservation and Ecology (Section 5.4)</b> |  | In                    | <ul style="list-style-type: none"> <li>▪ Detailed review of existing available information; and</li> <li>▪ Assessment of the effects of dredging on the identified impact pathways for each of the receptor groups.</li> </ul> <p>No dedicated marine ecology surveys are proposed for this EIA as sufficient information is available for characterisation from previous surveys.</p> |
| <b>Benthic ecology</b>                               | Potential impacts on benthic species and habitats receptors from seabed removal (species and habitat loss)           | In                    |  |
|  | Potential impacts due to the suspended sediment plume (increased SSC)  | In                    |  |
|  | Potential impacts due to fine sand dispersion (including bedform) and deposition                                     | In                    |  |
|  | Potential impacts due to bathymetric changes (including sediment flux) following dredging                            | In                    |  |
|  | Potential disturbance due to underwater noise and vibration  | In                    |  |
|  | Potential impacts through the introduction of non-native species   | In                    |  |
| <b>Fish and shellfish</b>                            | Potential impacts of seabed removal (habitat loss) on spawning, nursery and overwintering grounds                    | In                    |  |
|  | Potential impacts due to changes in water and sediment quality (due to fine sediment plume and fine sand dispersion) | In                    |  |
|  | Potential impacts due to underwater noise and vibration  | In                    |  |
| <b>Marine mammals and turtles</b>                    | Potential impacts to marine mammals due to the removal of seabed (habitat loss)                                      | In                    |  |
|  | Potential impacts from reduced water clarity (increased SSC) due to the suspended sediment plume                     | In                    |  |

| Topic  | Potential Impact Pathways  | Scoped In/ Out of EIA | Proposed Further Work  |
|--|--|-----------------------|--|
|  | Potential disturbance due to the underwater noise and vibration  | In                    |  |
|  | Potential impacts on turtles   | Out                   |  |
|  | Potential collision risk due to vessel movements   | Out                   |  |
| Ornithology  | Potential indirect effects on coastal waterbirds and seabirds as a result of seabed removal (including prey availability)                    | In                    |  |
|  | Potential impacts on the foraging of seabirds due to suspended sediment plumes (increased SSC)   | In                    |  |
|  | Potential impact of disturbance generated by vessel presence on waterbirds and marine birds (including visual, airborne noise and vibration) | In                    |  |
| Commercial and Recreational Fisheries (Section 5.5)    | Potential disruption of fisheries activities due to vessel movements   | In                    | <ul style="list-style-type: none"> <li>Review of available information and data,</li> <li>Consultation with fishermen and relevant organisations / regulators to determine the level and intensity of commercial and recreational fishing activity within and around Area 393; and</li> <li>Assessment on the effects of dredging on the identified fisheries pathways.</li> </ul>                   |
|  | Potential for fishing gear damage  | In                    |  |
|  | Potential impacts to fishing activities due to potential changes to fish stocks and distribution   | In                    |  |
| Commercial and Recreational Navigation (Section 5.6)   | Potential for vessel collision whilst working in the Licence Area  | In                    | <ul style="list-style-type: none"> <li>Key information on navigation and marine transport within the study area will be collected through consultation with local stakeholders and analysis of relevant statistics / data (excluding analysis of Automatic Identification System (AIS) data); and</li> <li>Assessment on the effects of dredging on the identified navigational pathways.</li> </ul> |
|  | Potential for vessel collision whilst on transit to and from the Area  | In                    |  |
|  | Displacement of vessels from Area 393 during the dredge activity   | In                    |  |
|  | Water quality impacts from pollutants resulting from accidents, incidents or spillages   | Out                   |  |
| Marine archaeology and Cultural Heritage (Section 5.7) | Potential for direct damage to the marine archaeological resource (through action of the draghead)   | In                    | <ul style="list-style-type: none"> <li>To provide an overview on the historic environment in the study area based on existing archaeological records and secondary sources;</li> </ul>   |

| Topic  | Potential Impact Pathways  | Scoped In/ Out of EIA | Proposed Further Work   |
|--|--|-----------------------|---|
|  | Potential for indirect damage to the marine archaeological resource (through changes to re-deposition of sediment/ changes in sedimentation/erosion) | In                    | <ul style="list-style-type: none"> <li>To highlight known sites that may be impacted by the proposal with particular reference to located marine sites and recorded shipping losses;</li> <li>To summarise the potential for the presence of hitherto unknown sites that may be impacted by the proposal;</li> <li>To comment on the importance of known and potential sites;</li> <li>To set out the statutory, planning and policy context relating to the historic environment in the study area; and</li> <li>To assess the effects of dredging on the identified archaeological pathways.</li> </ul> |
| <b>Coast Protection and Flood Defence (Section 5.8)</b>    | Potential for maintaining source of aggregate for coastal defences and beach nourishment   | In                    | <ul style="list-style-type: none"> <li>A review of the baseline conditions;</li> <li>Consider information contained in previous Area 393 reports;</li> <li>Provide consideration of future climate change impacts in the region; and</li> <li>Assess the effects of dredging on the identified pathway.</li> </ul>  |
|  | Potential for changes to wave height/exposure to affect coastal protection/flood defence   | Out                   |   |
| <b>Infrastructure and Other Marine Users (Section 5.9)</b> | Potential impacts of physical processes changes on marine and land-based infrastructure  | In                    | <ul style="list-style-type: none"> <li>A review of the baseline conditions; and</li> <li>Assessment of the effects of dredging on the identified pathway.</li> </ul>  |
| <b>Cumulative/ in-combination (Sections 4.2.6; 5.10)</b>   | Potential effects of the proposed marine aggregates dredging licence renewal alongside those arising from other plans, projects, and activities      | In                    | The potential cumulative/in-combination effects of dredging in Area 393 and other known activities, plans or projects in the area will be considered.   |
| <b>Airborne Noise and Vibration</b>                        | Airborne noise and vibration effects as a result dredging operations   | Out                   | No further work is required.  |
| <b>Air Quality</b>   | Changes in air quality and greenhouse gas emissions as a result dredging operations  | Out                   | No further work is required.  |

| Topic                         | Potential Impact Pathways   | Scoped In/ Out of EIA | Proposed Further Work        |
|-------------------------------|---|-----------------------|------------------------------|
| Human Health                  | Effects on human health as a result dredging operations                 | Out                   | No further work is required. |
| Landscape/Seascape and Visual | Landscape and visual effects during as a result dredging operations     | Out                   | No further work is required. |
| Light                         | Potential lighting effects as a result dredging operations              | Out                   | No further work is required. |
| Terrestrial Ecology           | Effects on terrestrial ecology features as a result dredging operations | Out                   | No further work is required. |

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## 8 Abbreviations/Acronyms

|          |   |
|----------|---|
| AA       | Appropriate Assessment                                      |
| ADZ      | Active Dredge Zone  |
| AEOI     | Adverse Effect on Integrity                                 |
| AEZ      | Archaeological Exclusion Zone                               |
| AGG      | Aggregates (policies of the Marine Plan)                    |
| AIS      | Automatic Information System                                |
| BMAPA    | British Marine Aggregate Producers Association              |
| BTO      | British Trust for Ornithology                               |
| CCW      | Countryside Council for Wales                               |
| CD       | Chart Datum   |
| Cefas    | Centre for Environment, Fisheries and Aquaculture Science   |
| CFBD     | Coastal Flood Boundary Conditions                           |
| CIEEM    | Chartered Institute of Ecology and Environmental Management |
| CifA     | Chartered Institute for Archaeologists                      |
| CIS      | Coastal Impact Study  |
| DECC     | Department of Energy and Climate Change                     |
| Defra    | Department for Environment Food and Rural Affairs           |
| DfT      | Department for Transport                                    |
| EC       | European Commission   |
| EIA      | Environmental Impact Assessment                             |
| EMODnet  | European Marine Observation and Data Network                |
| EMS      | Electronic Monitoring System                                |
| ERM      | Environmental Resources Management Ltd                      |
| ES       | Environmental Statement                                     |
| EU       | European Union  |
| EUNIS    | European Nature Information System                          |
| EUSeaMap | Habitat map of physical habitats covering European waters   |
| FMP      | Fisheries Management Plans                                  |
| FSA      | Formal Safety Assessment                                    |
| GES      | Good Environmental Status                                   |
| GIS      | Geographic Information System                               |
| GPS      | Global Positioning System                                   |
| H:CPA    | Heneb: Clwyd-Powys Archaeology                              |
| HAT      | Highest Astronomic Tide                                     |
| HM       | His Majesty's   |
| HMSO     | His Majesty's Stationery Office                             |
| HRA      | Habitats Regulations Assessment                             |
| HSC      | Historic Seascape Characterisation                          |
| ICES     | International Council for the Exploration of the Sea        |
| IEMA     | Institute of Environmental Management and Assessment        |
| IFCA     | Inshore Fisheries and Conservation Authority                |
| IMO      | International Maritime Organization                         |
| INNS     | Invasive Non-Native Species                                 |
| JNAPC    | Joint Nautical Archaeology Policy Committee                 |
| JNCC     | Joint Nature Conservation Committee                         |
| LAT      | Lowest Astronomic Tide                                      |
| LSE      | Likely Significant Effect                                   |
| LUC      | Land Use Consultants  |

|            |  |
|------------|--|
| MAI        | Marine Aggregate Industry  |
| MCA        | Maritime and Coastguard Agency   |
| MCAA       | Marine and Coastal Access Act  |
| mCD        | Metres Chart Datum   |
| MCZ        | Marine Conservation Zone   |
| MHWN       | Mean High Water Neap   |
| MHWS       | Mean High Water Springs  |
| MLT        | Marine Licensing Team  |
| MLWN       | Mean Low Water Neap  |
| MLWS       | Mean Low Water Spring  |
| MMO        | Marine Management Organisation   |
| mODN       | Metres Ordnance Datum Newlyn   |
| MODIS      | Moderate Resolution Imaging Spectroradiometer  |
| MPA        | Marine Protected Area  |
| MPS        | Marine Policy Statement  |
| MSDS       | MSDS Marine  |
| MSFD       | Marine Strategy Framework Directive  |
| MSL        | Mean Sea Level   |
| MSS        | Mersey Sand Suppliers  |
| NBN        | National Biodiversity Network  |
| NERC       | The Natural Environment and Rural Communities  |
| nm         | Nautical Mile  |
| NMRW       | National Monument Record of Wales  |
| NRW        | National Resources Wales   |
| NWIFCA     | North Western Inshore Fisheries and Conservation Authority   |
| ODN        | Ordnance Datum Newlyn  |
| OneBenthic | Online benthic portal for grab, core and trawl data, maintained by Cefas                               |
| OSPAR      | Convention for the Protection of the Marine Environment of the North-East Atlantic                     |
| PBDE       | Polybrominated Diphenyl Ethers   |
| PIZ        | Primary Impact Zone  |
| PSA        | Particle Size Analysis   |
| Ramsar     | Wetlands of international importance, designated under The Convention on Wetlands (Ramsar, Iran, 1971) |
| RBMP       | River Basin Management Plan  |
| RCP        | Representative Concentration Pathway   |
| REA        | Regional Environmental Assessment  |
| RGMP       | Regional Geophysical Monitoring Programme  |
| RSMP       | Regional Seabed Monitoring Plan  |
| RYA        | Royal Yachting Association   |
| SAC        | Special Area of Conservation   |
| SBP        | Sub Bottom Profiler  |
| SD         | Standard Deviation   |
| SEA        | Strategic Environmental Assessment   |
| SI         | Statutory Instrument   |
| SIZ        | Secondary Impact Zone  |
| SMP        | Shoreline Management Plan  |
| SPA        | Special Protected Area   |
| SS         | Steam Ship   |
| SSC        | Suspended Sediment Concentrations  |
| SSSI       | Site of Special Scientific Interest  |
| TCE        | The Crown Estate   |
| TSHD       | Trailing Suction Hopper Dredger  |

|        |                                    |
|--------|------------------------------------|
| TSS    | Traffic Separation Scheme          |
| UK     | United Kingdom                     |
| UKCP18 | UK Climate Projections (2018)      |
| UKHO   | United Kingdom Hydrographic Office |
| UXO    | Unexploded Ordnance                |
| VMS    | Vessel Management System           |
| WFD    | Water Framework Directive          |
| WNMP   | Welsh National Marine Plan         |

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

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