

REPORT

Holyhead Port Expansion Environmental Statement

Non-Technical Summary

Client: Stena Line Ports Limited

Reference: I&BPB6108R040F0.1

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Date: 17 June 2019



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Acronyms

Acronym	Acronym description
AL	Cefas Action Level
bCD	below Chart Datum
CIA	Cumulative Impact Assessment
dBA	Decibel - level of sound in air perceived by the human ear
EIA	Environmental Impact Assessment
EPUK	Environmental Protection UK
ES	Environmental Statement
HRA	Habitats Regulations Assessment
HRO	Harbour Revision Order
IAQM	Institute of Air Quality Management
MMO	Marine Management Organisation
MWR	Marine Works Regulations
NRW	Natural Resources Wales
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
Ro-Ro	Roll on-Roll off
SAC	Special Area of Conservation
SSC	Suspended sediment concentrations
TSHD	Trailer Suction Hopper Dredger
UK	United Kingdom
WFD	Water Framework Directive

1 Introduction

1.1 Purpose of Document

This document represents the 'Non-Technical Summary' (NTS) of the Environmental Statement (ES) for the proposed scheme, providing an overview, in non-technical language, of the main findings of the ES. It is important to note that this NTS does not, and is not intended to, convey all of the information relating to the proposed scheme and its potential effects on the environment. By necessity, the text provided herein is a summary of the detailed assessments discussed in the ES.

1.2 Background

Holyhead Port is located on Holy Island (Ynys Gybi) on the western side of the Isle of Anglesey, North Wales. The port is privately owned by Stena Line and forms the principal link for surface transport from north Wales and central and northern England to Ireland.

Holyhead Port is the second busiest roll-on / roll-off ('Ro-Ro') ferry port in the UK, responsible for direct employment of 25% of the local workforce and providing indirect employment elsewhere on Anglesey, though it is currently operating near full capacity. The port also supports a flourishing cruise industry, with an increase in cruise ship passenger numbers predicted. The ships currently dock at the former Anglesey Aluminium jetty (now called the Orthios jetty); however, sometime in the near future this jetty may be required for ships supporting the biomass project. As such, a new deep-water cruise berth is required.

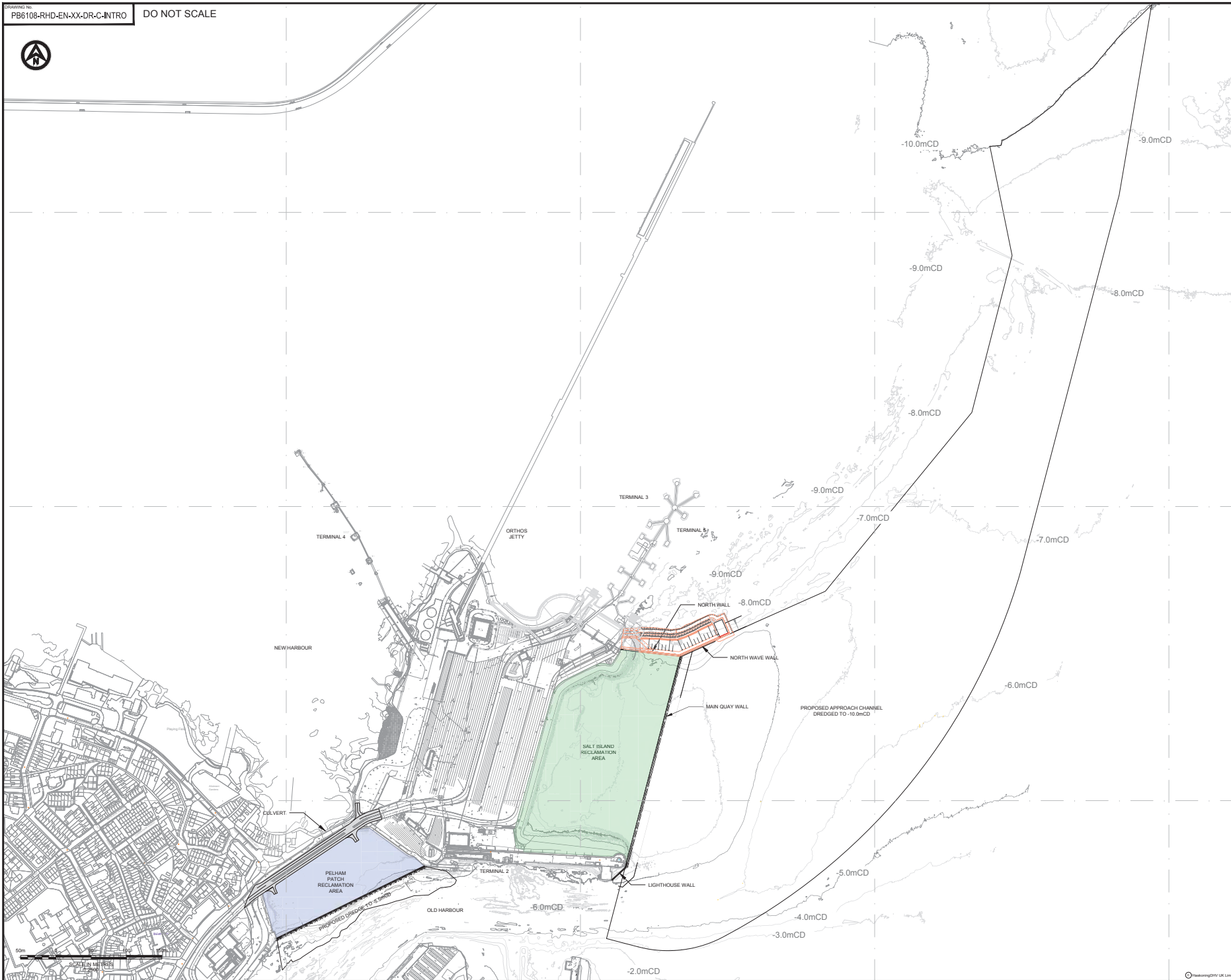
Stena Line Ports Ltd ('Stena Line') is proposing to expand Holyhead Port through the reclamation of two areas (known as the Salt Island Expansion and Pelham Patch Development) to provide new berths and associated landside areas for port-related use, and to develop a new approach channel to 10m below Chart Datum (bCD) (**Figure 1.1**) (henceforth referred to as the proposed scheme).

The proposed scheme requires approval through two key pieces of legislation, namely:

- The Harbours Act 1964, as amended; and,
- The Marine and Coastal Access Act 2011, as amended.

1.3 Consenting Strategy

The proposed scheme for which consent is being sought comprises all elements as set out in **Chapter 4** of this NTS and which therefore were assessed within the ES; however, there is a scenario whereby the Pelham Patch Development may not go ahead. As such, the ES also considers a scheme that comprises the Salt Island Expansion and approach channel capital dredge only. In order to achieve this, the scheme that would result in the 'worst-case' scenario was assessed.



NOTES
1. ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE
2. ALL LEVELS IN METERS CHART DATUM (mCD). CHART DATUM AT HOLYHEAD TAKEN AS 3.05m BELOW ORDNANCE DATUM
3. COORDINATE SYSTEM IS OSGB-GPS-2002



SITE LOCATION PLAN
SCALE 1:25000

P1.0	14.11.18	EIA INFORMATION	DD	AD	TD
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT



PROJECT HOLYHEAD PORT
EXPANSION EIA

TITLE
Figure 1.1
EXTENT OF DEVELOPMENT
WORKS



DRAWN	DD	CHECKED	AD	APPROVED	TD
DATE	27.11.18	SCALE	N.T.S.	REF.	
DRAWING NO	PB6108-RHD-EN-XX-DR-C-INTRO	SUITABILITY	S2	REVISION	P1.0

2 The Environmental Impact Assessment (EIA) Process

2.1 What is EIA?

In accordance with European and UK law, certain projects must be the subject of a particular process of environmental assessment due to their size, nature and the likelihood that they will have significant effects upon the environment. This assessment process is known as EIA.

EIA provides a valuable opportunity to avoid and reduce potential environmental impacts through design refinement. Environmental constraints and issues were identified through consultation, extensive environmental surveys and technical assessments. The information gathered has informed decision-making throughout the design process, providing opportunities to address potentially significant impacts where practicable, for example by refinement of the proposed scheme design or by the incorporation of measures to avoid or reduce potential adverse impacts.

2.2 Requirement for EIA

An EIA screening and scoping request was made in April 2017 under the requirements of the MWRs to Natural Resources Wales (NRW) and the HWRs to the Marine Management Organisation (MMO). At the same time Stena Line submitted notification of its intent to apply for a Harbour Revision Order (HRO) under Section 14 of the Harbours Act 1964 (as amended by the Harbour Works (EIA) Regulations 1999) to the MMO. As the scoping request was made before the 16th of May 2017, the EIA has been produced in accordance with the EIA Directive (2011/92/EU).

As of the 1st April 2018, under the Wales Act 2017, the Welsh Government (WG) took over responsibility from the Department for Transport and the MMO for port development policy for devolved harbours wholly in Wales. As such the HRO application will be submitted to WG.

Due to the size and nature of the proposed scheme, an EIA is required under the following EIA Regulations:

- The Marine Works (EIA) Regulations 2007, as amended (MWRs); and,
- The Harbour Works (EIA) Regulations 1999 (HWRs).

2.3 Scope of the EIA

The following topics were required to be considered ('scoped in') by the EIA as having the potential to be significantly affected:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Designated Sites • Coastal Processes • Marine Water and Sediment Quality • Marine and Coastal Ecology • Fish and Shellfish Resource • Marine Mammals • Commercial Fisheries • Ornithology • | <ul style="list-style-type: none"> • Commercial and Recreational Navigation • Traffic and Transport • Noise and Vibration • Air Quality • Archaeology and Cultural Heritage • Visual Setting • Coastal Defence and Flood Risk • Tourism and Recreation • Socio-economics |
|--|---|

The characteristics of the existing (baseline) environment for each topic have been defined, and the potential environmental impacts of the proposed scheme identified and assessed through the following methods and activities:

- Desk based reviews, interpretation and assessment of existing data;
- Site surveys; and,
- Consultation.

The following surveys and investigations have been undertaken to characterise the baseline environment and predict environmental effects:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Hydrodynamic, sediment dispersion and wave modelling • Turbidity monitoring • Geophysical survey • Hydrographic survey • Sediment quality survey • Marine intertidal and subtidal surveys | <ul style="list-style-type: none"> • Underwater noise modelling • Baseline noise survey and modelling • Air quality modelling • Archaeological Desk Based Assessment • Visual assessment • Traffic survey • Socio-economic impact assessment |
|--|---|

2.4 Consultation

Consultation has been ongoing throughout the EIA process including the WG, NRW, the Isle of Anglesey County Council, Cadw, Gwynedd Archaeological Planning Service, the Royal Commission on the Ancient and Historical Monuments of Wales and the RSPB. In addition, public consultation has been undertaken at key stages of the process. Public exhibitions were held at Holyhead Town Hall in August 2018 and March 2019.

2.5 Impact Assessment

Impact assessment is a fundamental element of the EIA process and the results of this process are presented in the ES. Impacts are positive or negative and result either directly or indirectly from activities associated with the proposed scheme. Each potential impact is assessed for its

likely significance, based on a number of factors including the sensitivity and environmental or economic value of the receptors being considered, the magnitude of the impacts and the risk of such impacts occurring.

In addition to the determination of potential impacts from the proposed scheme, an assessment of the potential for cumulative effects has been undertaken, which considers the impacts from the proposed works with potential impacts from other proposed projects in the wider vicinity.

2.6 Mitigation

Mitigation measures have been proposed, where available and practical, in those cases where adverse impacts have been identified. It is important to note that the mitigation measures applied should be proportionate to the scale of the impact predicted. Appropriate mitigation measures have been discussed and agreed, where possible, with the relevant regulatory authorities and stakeholders.

Whilst mitigation for minor or negligible impacts may not be specifically defined as a matter of course, industry standard or 'embedded' mitigation often applies in these cases. It is also recognised that minor and negligible impacts could become significant when considered cumulatively with other pressures on a receptor and, in this event, mitigation may be required.

2.7 Residual impacts

Where further mitigation measures are identified, the significance of the residual environmental impact (i.e. the post-mitigation impact) is assessed.

2.8 Reporting

The findings of the EIA are presented in the ES. In addition to adhering to the requirements of the EIA Directive, the ES also meets the requirements of:

- the Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC)
- the Water Framework Directive (2000/60/EC)

This NTS presents a summary of the ES, including key aspects of the proposed scheme and the associated beneficial and adverse impacts considered to be of particular importance. Further details about the likely significant impacts of the proposed scheme can be found within the full text of the ES. The ES documents have been subdivided into three volumes:

1. NTS;
2. ES Main Report; and,
3. Technical Appendices (Volume I and II) – Specialist Technical Reports.

3 Need for the Proposed Scheme

Whilst the volume of passengers, car units and coaches has remained relatively stable over recent years, the volume of freight has continued to grow, reaching its highest level ever in 2017 and as a result the port is nearing full capacity, as illustrated in **Figure 3.1**. Surrounded by the town of Holyhead, there is no space available in which the Port can expand to meet current and future demands.

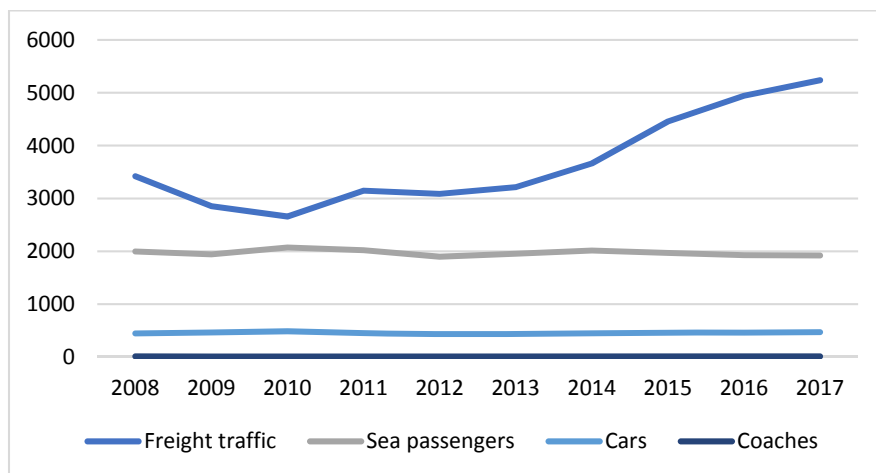


Figure 3.1 Development of port traffic at Holyhead Port 2008 - 2017 (freight traffic in '000s of tonnes)

The Port supports a flourishing cruise industry, which contributes more than £2.4m to the Welsh economy over the year. The ships currently dock at the Orthios jetty; however, sometime in the near future this jetty may be required for ships supporting the biomass project. An agreement is currently in place for Orthios to accommodate cruise calls up to 2018, with a variation in the lease to allow calls up to 2020. Beyond this there is a risk that without the proposed scheme, Holyhead and North Wales will lose the cruise industry business entirely. As such, a new deep-water cruise berth is vitally important.

There is also a rapidly increasing marine renewable energy industry forming in the Irish Sea and around Anglesey, comprising tidal turbines and offshore wind. Currently there is very limited space and facilities that can support this industry. The proposed scheme would enable Holyhead Port, and the wider community, to promote investment and development of the renewable energy sector in the Irish Sea and to support investors and their supply chains to secure long-term economic growth for the area.

In summary, the proposed scheme will:

- safeguard the nationally important cruise industry;
- contribute significantly to the economy and well-being of Holyhead, Anglesey and Wales;
- support the marine renewable energy sector and Wylfa Newydd; and,
- future-proof the port's facilities in anticipation of the, currently unknown, requirements resulting from the UK leaving the European Union.

4 The Holyhead Port Expansion Project

4.1 Overview

The proposed scheme comprises the reclamation of two intertidal/subtidal areas (the Salt Island Expansion and the Pelham Patch Development) and the dredging of an approach channel to 10m bCD (see **Figure 1.1**). Approximately 9ha of new quay storage and handling space would be created together with two berths: a 370m deep-water berth and a 280m berth. The reclamations would take approximately 24 months to complete, commencing in Spring 2020. It has been assumed that noisy construction works would take place 7am-7pm, Mondays to Fridays, and from 8am to 12pm on Saturdays, with a total duration of driven piling of 3hrs and 10.5hrs of drill piling per day. Dredging and all other construction works would take place 24hrs, seven days a week.

The Salt Island Expansion is proposed to serve as a new multi-purpose use area, including intermodal freight, Ro-Ro and Lo-Lo freight traffic, heavy and abnormal loads, as well as a new berth for cruise ships. This area would comprise:

1. The reclamation of an area extending from the north- and south-east corners of Salt Island, forming approximately 65,750m² of new port land and requiring approximately 720,000m³ of fill material. Fill material would comprise approximately 520,000m³ of dredged arisings and approximately 200,000m³ would be imported;
2. A 370m long berth, referred to as the Main Quay Wall;
3. A 30m wall around the Lighthouse on Admiralty Pier ('the Lighthouse Wall');
4. A 100m wall that forms the northern extent of the reclaimed area, referred to as the North Wall;
5. A 90m long wall extending from the north-eastern extent of the reclaimed area to shelter vessels at berth, referred to as the North Wave Wall;
6. A reinforced concrete heavy lift pad; and,
7. Two hi-bay workshops, each with an associated office building.

The Pelham Patch Development is proposed to serve as a new multi-purpose berth and set-down area, as well as a potential security and customs facility. This area would comprise:

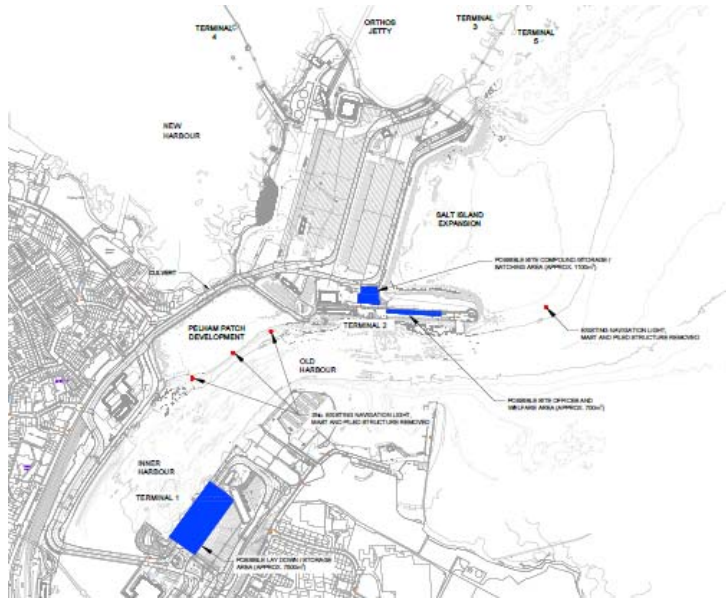
1. The reclamation of an area between Marine Yard and Salt Island, forming approximately 24,250m² of new port land and requiring approximately 163,500m³ of fill material. Fill material would comprise approximately 120,000m³ of dredged arisings and 43,500m³ would be imported;
2. The construction of a 280m quay wall;
3. Blocking up the culvert running under Salt Island Bridge;
4. Re-alignment of the service road, which links Salt Island to Holy Island, away from residential and commercial properties; and,
5. Replacement of the existing perimeter fencing with a more open design to reduce the enclosed character of the area and improve views across the Old Harbour.

4.2 Description of the Construction Phase

4.2.1 Enabling works

The proposed scheme would require the removal of four navigational structures, one located to the east of Admiralty Pier, and three located adjacent to the Pelham Patch Development site.

It is anticipated that there would be two site compounds, one located on the south side of Salt Island and the other near Terminal 1, in the old harbour (as shown on the right). The site compound on Salt Island would be located within an area currently used as a car park and set-down area for Port Control at the south-east corner of Salt Island and an area of the existing quay wall along Admiralty Pier. The second site compound would provide a storage cabin and used for the delivery and storage of the piles. It is proposed that a concrete batching plant and rock crushing equipment would be set up on the Salt Island compound.



The vast majority of equipment and materials would be delivered by sea, at with Terminal 1 or 2. An allowance has been made for imported fill and aggregate to be delivered by road.

4.2.2 Quay wall construction

Combi-wall (preferred option)

It is anticipated that the quay walls would be constructed using steel tubular piles with sheet piles in between. The majority of the installation would be done by drilling; however, the piles will need to be driven through the soft surface soils (soft and stiff clays) to the hard substrate beneath. It has been estimated that approximately 10.5 hours of drilling and three hours of driven piling would be carried out per day.

It is estimated that piling would take up to nine months (35 weeks to complete the Salt Island Expansion walls and 16 weeks for Pelham Patch Development) to complete, at an installation rate of one tubular and three sheet piles per day assuming a 12-hour working day (7am to 7pm) and working six days a week.

When the construction of the walls is complete, rock armouring would be placed to the north of the Salt Island Expansion area, consisting of concrete Tetrapods or rock.

Caisson wall (alternative methodology)

An alternative approach to construction is the use of caissons to form the quay walls. These would be fabricated offsite and delivered by sea. Before the caissons can be sunk into place, a dredge

pocket would be required to form a level, stable base. The caissons would be positioned one at a time and sunk into place by pouring imported granular fill into the top of the caisson.

Rock revetment (alternative methodology)

An alternative approach to the construction of the Salt Island Expansion North Wall is a rock revetment, armoured with Tetrapods or rock.

4.2.3 Reclamation works

Reclamation would commence at the same time as the installation of the quay walls. Within the Salt Island Expansion area, the existing rock armouring (present on the north, west and south quay walls) would be removed as the reclamation progresses. Approximately 420m³ of the rock would be re-used to rock-armour the blocked-up culvert to the west of Pelham Patch (see below). The rest of this material would be broken down, as required, into smaller pieces, by peckering and then rock breaking, to be used within the reclamation.

Imported fill (comprising sand and gravel) would be used to form the base within the reclamation area directly behind the quay wall, upon which dredged material (consisting of soft clay, firm clay and gravel) would be placed. The physical properties of the dredged material would be improved using cement using land-based plant. Once the reclaimed area has been filled to 4m aCD, band drains would be installed to aid with dewatering the dredged material. An anchor wall would then be installed, using sheet piles through the fill, approximately 30m behind the quay wall. Horizontal tie-rods between the anchor wall and the quay wall would be installed at 5m aCD using land-based plant.

The filling of the reclamation area would continue using both imported and dredged material and surcharged using imported fill. A capping beam would be fitted and then quay furniture, consisting of bollards, fenders and safety ladders would be fitted as required.

Within the Salt Island Expansion area, a Heavy Lift Pad, approximately 2,250m², would be installed adjacent to the quay wall following completion of the reclamation works, by piling through the reclaimed area.

4.2.4 Fuel pipeline

In order to provide refuelling services to vessels and barges visiting the new berth, a fuel pipeline would be installed to connect the existing fuel tanks located adjacent to Terminal 4 to the new Main Quay Wall. This facility will be installed at the same time as the surface water drainage and the electrical connection points.

4.2.5 Installation of scour protection

Approximately 9,275m³ of firm clay would be removed and replaced with the same volume of rock or a combination of rock and concrete mattresses to provide scour protection along the Main Quay Wall.

4.2.6 Blocking of the existing culvert

For the reclamation of the Pelham Patch Development, the culvert which runs underneath the

service road would be blocked. It is anticipated that this will be undertaken by the installation of a concrete and would be sealed using grout and rock armouring would then be placed to match the existing rock armouring either side of the culvert.

4.2.7 Road realignment

Once reclamation is complete, the existing service road to Salt Island would be realigned away from the residential and commercial areas along Victoria Road.

4.2.8 Dredging requirements and methods

Dredging requirements

An approach channel of approximately 500,000m² is proposed. The target dredge depth for the channel is 10m bCD and the estimated maximum volume of dredged material arising from this area is approximately 1.9Mm³. Existing sea bed levels in the proposed approach channel vary between approximately 3 and 8m bCD. Therefore, the maximum depth of dredging is anticipated to be approximately 7m.

Following the installation of the quay wall at Pelham Patch there will be a requirement to remove hard soils at the face of the newly installed wall to 5.5m bCD. Some dredging within the reclamation areas may also be required to remove material that does not provide suitable bearing for the reclamation works.

Dredging methods

A trailing suction hopper dredger (TSHD) is proposed to dredge the softer soils. It is capable of transporting the dredged soils to the reclamation area and discharging using a floating pipeline or rainbow (spraying) method to provide fill material behind the quay wall. Dredged soils that are not required for reclamation would be transported to the offshore disposal site and discharged instantaneously through doors in the hull of the TSHD.

A backhoe dredger is proposed to dredge the rock and firm soils which cannot be dredged using the TSHD. The backhoe dredger would be supported by a suitable barge and tug vessel. Where dredging of hard soils and rock is required to achieve the required dredge depth, it may be necessary for the backhoe dredger to utilise a rock breaker or ripper to fracture the rock prior to dredging. Material dredged would be loaded into the barge for transportation to the reclamation areas, if suitable for use as fill material, or to the offshore disposal site.

4.2.9 Disposal requirements

Following the re-use of dredged material within the reclamation areas, the remaining dredged material would be disposed of offshore, at a licenced disposal site (Holyhead North). Up to 1.6Mm³ of material would be disposed of at this site, depending on the construction approach adopted by the preferred contractor.

4.2.10 Programme

It is expected that the proposed scheme would take approximately 24 months to complete, commencing in Spring 2020. The anticipated durations for the various construction activities is provided below.

Construction Activity	Duration (weeks)
Enabling works	6
Piling (Salt Island Expansion)	35
Piling (Pelham Patch Development)	16
Dredging (TSHD)	19
Dredging (backhoe)	8
Reclamation (Salt Island Expansion)	98
Reclamation (Pelham Patch Development)	55
Road realignment and blocking of culvert	23

4.2.11 General measures to manage environmental risks

As with any construction project, there is the potential for spillages or leakages of oils, fuels or construction materials which would directly or indirectly impact upon the marine environment. The potential also exists for the spillage or leakage of fuels or oils used during the operational phase. The risk of this occurring will be managed through the implementation of best practice measures during construction through the production of a Construction Environmental Management Plan (CEMP) and using the Port's existing pollution prevention plans during operation.

Furthermore, Holyhead Port has an Oil Spill Contingency Plan that will be adhered to. As sufficient measures are in place to respond to a pollution event during the construction and operation of the proposed scheme, the risk of a significant effect is considered to be low.

4.2.12 Alternative options considered

A range of alternative options to the proposed scheme were considered, including alternative cruise berth locations, incorporation of an additional reclamation area and a do-nothing scenario. None of these options were considered feasible in terms of achieving the required economic objectives or minimising environmental effects, which led to the identification of the preferred option. Where more than one methodology has been proposed for a specific activity (for example installation of the new quay walls), the EIA considers the environmental worst-case scenario.

4.3 Description of the operational phase

4.3.1 Salt Island Expansion – New multi-purpose and cruise berth

The new Salt Island Expansion area would be finished with blockwork paving and gravel covering 20,250m² and 43,250m² of the reclaimed area, respectively. The area would have two functions:

1. Providing a new deep-water multi-purpose berth for deep-draft vessels; and,
2. Providing a berth for cruise vessels that currently use the Orthios Jetty.

It is proposed that the Salt Island Expansion site would be used 24 hours a day, seven days a week to accommodate cruise ships and dry bulk vessel movements, as required. Salt Island is currently operational 24 hours a day, seven days a week as both Irish Ferries and Stena Line Ports run throughout the year, with Christmas Day the only exception. An artist's impression of how the Salt Island Expansion would look with and without a cruise vessel berthed alongside is presented in **Figure 4.1**.

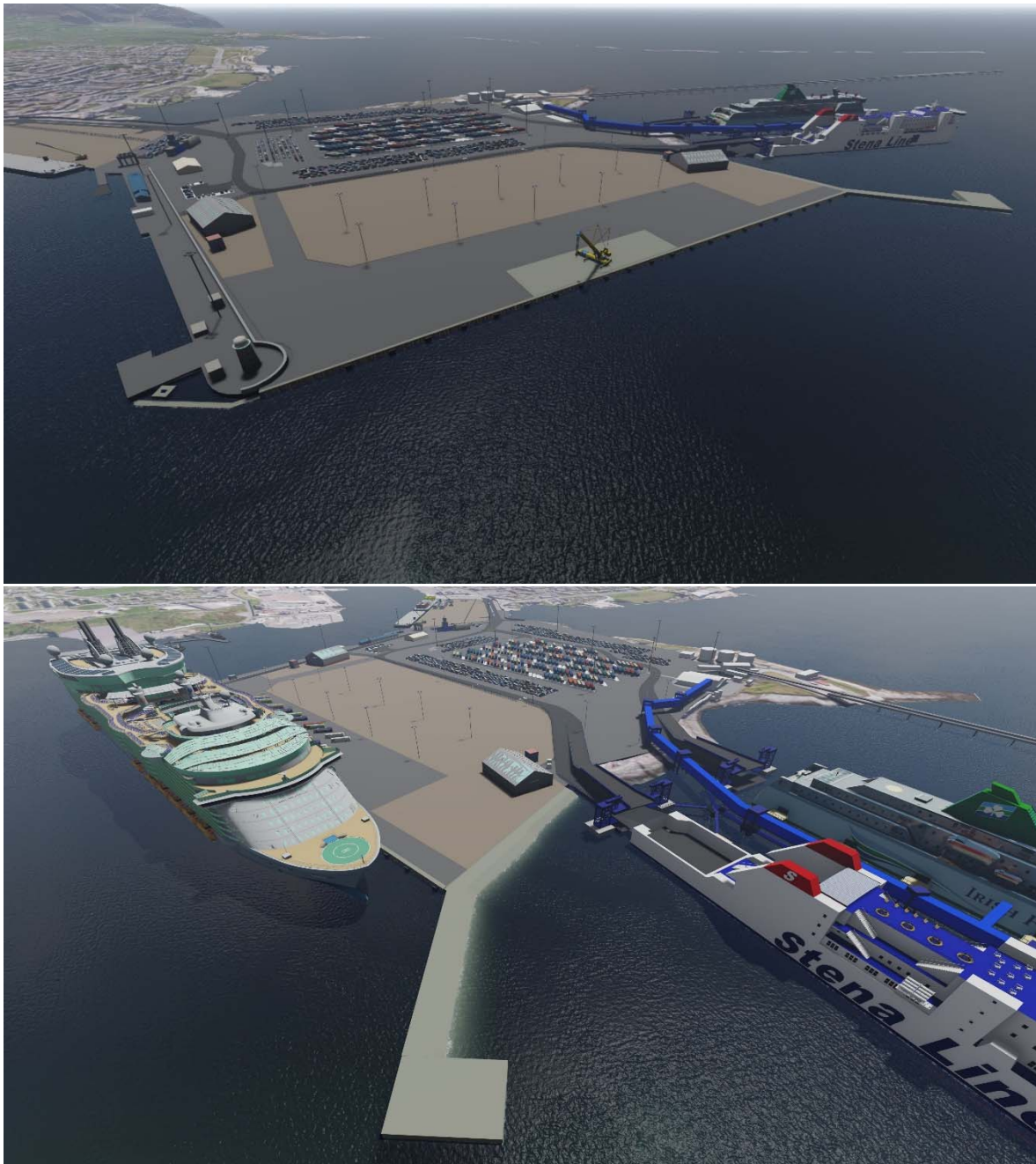


Figure 4.1 3D representation of the proposed Salt Island Expansion

4.3.2 Pelham Patch Development – New multi-purpose berth

The Pelham Patch Development area would be finished with gravel, providing 22,575m² of storage area. The realigned service road to Salt Island would be connected to the area by two road spurs. Operationally this area would be used as a multi-purpose berth, providing additional berthing for dry bulk vessels and barges, and onshore storage for, for example, containers and pallets. The existing fencing line would not change; however, the fencing would be replaced to allow enhanced views of the port and its operations. The Pelham Patch Development area would be operational 24 hours a day, seven days a week, and no lighting is proposed on the reclaimed area. An artist's impression of how the Pelham Patch Development would look is presented in **Figure 4.2**.



Figure 4.2 3D representation of Pelham Patch

4.3.3 Maintenance dredge requirements

The volume and frequency of maintenance dredging is difficult to predict; however, water quality monitoring has shown that levels of suspended sediment within the water are low and as such, the rate of suspended sediment deposition across the proposed approach channel is considered to also be low. Also, current flow across the seabed of the proposed approach channel is very low, suggesting that the movement of sediment across the seabed is also low. Given this the requirement for maintenance dredging in the proposed approach channel is anticipated to be low.

5 Summary of Predicted Environmental Impacts

5.1 Coastal processes

The proposed land reclamations and approach channel dredge have the potential to affect coastal processes (tidal currents and waves) and the seabed morphology. These have been assessed using a suite of numerical models, including:

- developing a wave model to investigate potential impacts on wave conditions and associated flood risk along the coastline inside the Harbour caused by the new development;
- 2D hydrodynamic model for the Harbour, used to study impacts on the hydrodynamics; and,
- a local 3D hydrodynamic model used to simulate dispersion and deposition of suspended sediment plumes arising from the proposed dredging.

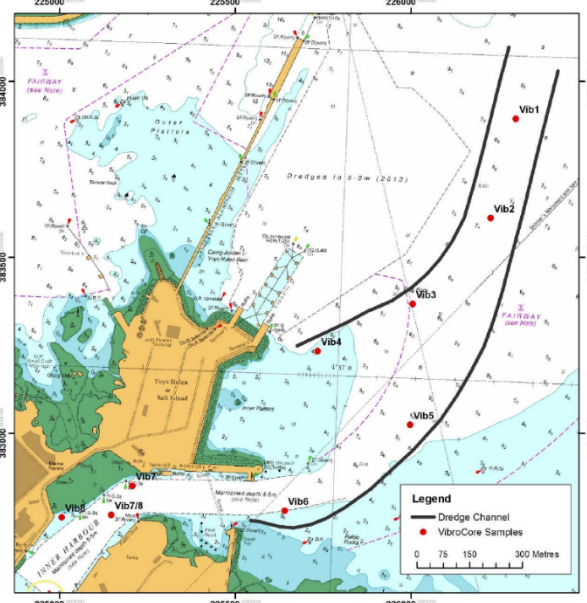
During construction, a **negligible** impact to coastal processes was identified as a result of potential changes in seabed level as a result of dredging the approach channel. Furthermore, there would be **no impact** to the sea-bed level as a result of disposal of dredge arisings at the licenced disposal site, Holyhead North.

During the operation of the proposed scheme, changes to the wave regime due to the presence of the deepened approach channel and reclaimed areas were considered to be a **negligible** close to the proposed scheme and **no impact** further away. The presence on the reclamation areas and the deepened approach channel was predicted to have no impact on the tidal current regime. Changes to sediment transport and erosion/accretion patterns were predicted to be **low** close to the proposed scheme and **no impact** further away.

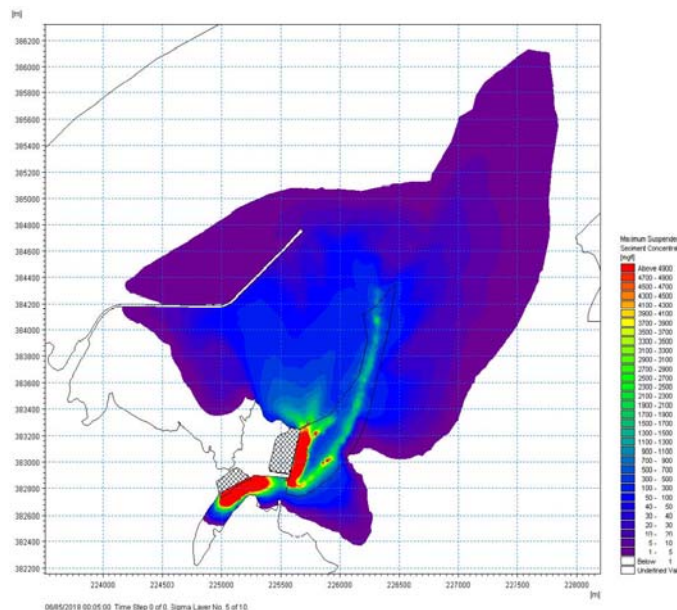
5.2 Marine water and sediment quality

To inform this assessment sediment samples were collected from the proposed approach channel area and adjacent to the proposed Pelham Patch Development area for chemical analysis.

The majority of samples were found to contain levels of contaminants below Cefas Action Level 1 (AL1), which would have no significant impacts to the marine environment. Of the contaminants which were above AL1, the levels recorded were only marginally above. As such, the dredged material is considered suitable for offshore disposal.

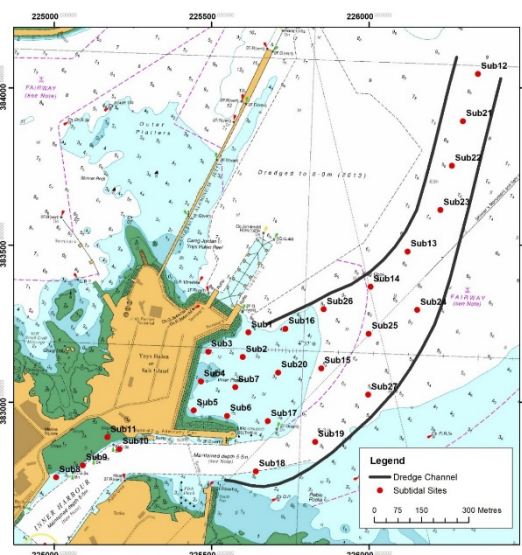


Potential impacts to water quality, through increased suspended sediment concentrations (SSC), as a result of dredging and land reclamation activities were assessed as being of **minor adverse** significance due to the localised extend of the affected area (as shown on the right), the rapid rate of dispersion and the non-continuous nature of the dredging activities allowing SSC levels to dissipate to within background levels (2.5hrs) between activities. Potential impacts to water quality at the disposal site through increases of SSC were also considered to be of **minor adverse** significance due to the open nature of the water and the reversibility of the impact.



Operational activities were assessed to have a **negligible** impact on water quality within Holyhead Bay as any impacts from increased shipping movements would be highly localised, short-term and temporary.

5.3 Marine and coastal ecology



To inform this assessment intertidal and subtidal surveys were undertaken (see left). The results of these surveys showed that the intertidal and subtidal habitats present are typical of those commonly found around the Anglesey and North West Wales coastline.

Although considered to be of high magnitude, the loss of intertidal and subtidal habitats within the reclamation areas and the footprint of the approach channel was determined to be of **minor adverse** significance due to the relatively common occurrence of the habitats throughout the coastline of Anglesey and North Wales.

Smothering of sea bed habitats by sediment suspended during dredging and reclamation activities was predicted to occur over the short to medium-term, with highest levels of deposition predicted to occur within the dredge change and adjacent to the proposed reclamation areas. Outside of the dredge footprint, levels of sediment deposition are predicted to decrease rapidly to less than 5mm. This level was not considered to be significant. As such an impact of **negligible** significance was predicted.

An invasive non-native species survey was also undertaken to determine the presence of carpet

sea squirt (*Didemnum vexillum*) on structures within and around the footprint of the proposed scheme. No carpet sea squirt were recorded during this survey. Given this, and adherence to Stena Line's biosecurity plan, a **negligible** impact on the spread of the invasive carpet sea squirt was predicted.

At the disposal site, the smothering of sea bed habitats by the deposition of dredged material was assessed as being of **minor adverse** significance, given the expected ability of the species present to recover over the short to medium term. Given the low levels of contamination recorded in the material to be disposed of, this was assessed as having a **negligible** impact on the habitats and species present at the disposal site.

Potential operational impacts of the proposed scheme from maintenance dredging, changes in coastal processes, changes in exposure of intertidal areas, seabed disturbance at the new berths, artificial lighting and the spread of the carpet sea squirt were all assessed as having a **negligible** impact on marine and coastal ecology.

5.4 Fish and shellfish resources

Information on fish and shellfish resources was gathered through a desk-based study of the area and the assessment was informed by underwater noise modelling undertaken on the proposed piling and dredging activities.

Potential impacts from underwater noise were assessed as being of **minor adverse** significance for fish species with a swim bladder (hearing specialists), and **negligible** for species without a swim bladder (hearing non-specialists). The application of a soft start piling procedure was considered to reduce the impact on hearing sensitive fish to **negligible**.

Potential impacts due to increased SSC during the dredging and reclamation activities were assessed as being of **negligible** significance due to the short time predicted for these levels to dissipate to within background levels (2.5hrs). Smothering of nursery or spawning grounds, or shellfish beds during dredging was also predicted to be **negligible**, as the impact has a limited range, being confined to within Holyhead Bay. Impacts on sea bass were assessed as **negligible** and impacts on sand eel through increases in SSC and smothering were predicted to be of **minor adverse** significance and impacts from underwater noise were predicted to be **negligible**.

The construction activities also have the potential to affect prey availability, through changes to water quality and habitat loss. It is expected that most adult finfish species would have the capacity to feed in unaffected areas and therefore a **negligible** impact was predicted for adult fish, with a **minor adverse** impact predicted for shellfish and juvenile fish, as they are less mobile or have a more restricted diet.

At the disposal site, potential impacts due to increased SSC and smothering of the seabed were assessed to be of **minor adverse** significance as although the impact is short-term and temporary the area affected includes spawning and nursery areas for fish.

Potential impacts arising from operation through changes to the maintenance dredging activities and changes to hydrodynamic and sedimentary regimes were assessed as **negligible**.

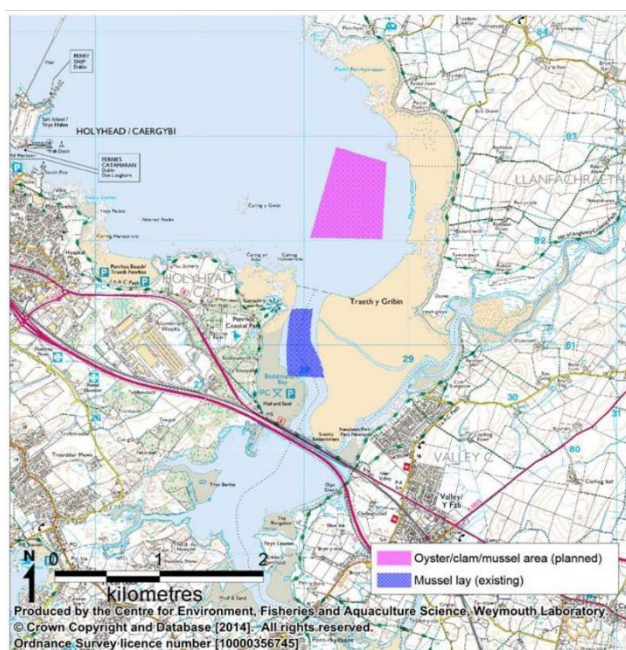
5.5 Marine mammals

An assessment of marine mammals has been undertaken using available information and underwater noise modelling. All potential impacts during construction (including vessel noise and noise generated during piling and dredging activities (alone and cumulatively), vessel collision risk and changes in prey availability) were assessed as having a **minor adverse** to **negligible** impact on marine mammals due to the small predicted impact ranges, and low population numbers predicted to be affected. Potential operational impacts were also assessed as being of **minor adverse** (collision risk to bottlenose dolphin) to **negligible** significance.

5.6 Commercial fisheries

The majority of potential impacts which could occur during the construction the proposed scheme (including disruption and displacement, and a reduction in fish/shellfish stocks) were assessed as being of **negligible** significance. A **minor adverse** impact was identified through the potential displacement of whelk fishing activity during construction at the disposal site. No impact was predicted to the classified bivalve harvesting area, approximately 2km to the east (see blue area on the figure of the left), as the effects of the proposed scheme are not predicted to extend this far.

Negligible impacts to commercial fisheries were identified during the operational phase as a result of displacement and effects on fish/shellfish stocks.



5.7 Ornithology

A desk study, undertaken to identify the bird species present, concluded that the area around the port itself is generally of low importance for birds, supporting only small numbers of a limited number of species throughout the year, with most species assessed as being of local importance. One species, black guillemot, is known to nest within the port area and is of regional importance and has therefore been scoped in for assessment along with the breeding bird assemblage.

Disturbance and displacement of black guillemot during construction was assessed as being of **moderate adverse** significance due to the potential loss of important nesting areas in the south wall (Admiralty Pier) of Salt Island. Mitigation through the installation of alternative nest boxes within the port was considered to reduce this impact to **minor adverse** significance.

All other potential impacts during the construction and operation of the proposed scheme to ornithology were assessed to be of **minor** or **negligible** significance.

5.8 Commercial and recreational navigation

Due to the services provided by Holyhead Port Control, which manages navigational safety within the Statutory Harbour Area, potential impacts to navigation during construction and operation of the proposed scheme were predicted to be of **minor adverse** significance. During the construction of the proposed scheme, Notice to Mariners would be issued to inform commercial and recreational mariners of when and what construction activities are taking place and what measures they should take to avoid them. This would reduce the significance of the potential impact to **negligible**.

5.9 Traffic and transport

A baseline traffic survey was undertaken to inform this assessment in accordance with national guidance. The most probable routes for traffic, for both movement of materials and personnel during the construction and operational phases of the proposed scheme include the A5, A55, A5154 and B4545 (see figure on the left).

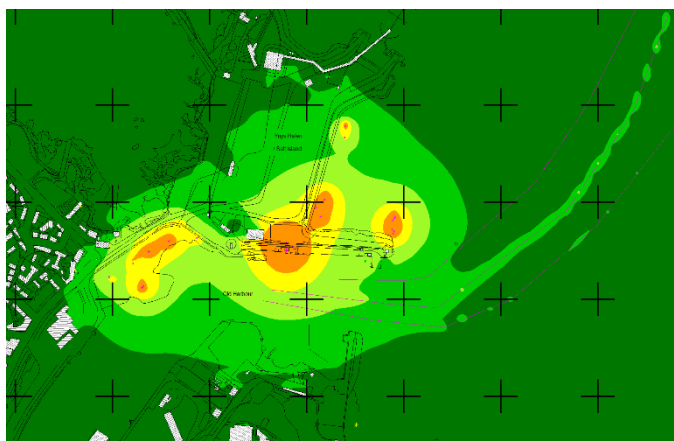
A total of 11 highway links within the traffic and transport study area were assessed for the effects of severance, pedestrian and cycle amenity, road safety and driver delay. The assessment concluded that the impact for all highway links was of **minor adverse** significance for both the construction and operational phases and was therefore not significant.



5.10 Noise and vibration

A baseline noise survey was undertaken at pre-identified noise sensitive receptors (NSR) to inform the assessment. Construction and operational activities have been modelled using approved software.

An impact of **moderate adverse** significance was predicted at NSR1 (residential premises on the corner of Prince of Wales Road and the A5154) during the daytime of Week 58 (a point in



the construction programme when majority of construction works at this area are ongoing simultaneously). All other impacts during construction and operation were assessed as being **negligible**.

With implementation of best practice measures, construction site noise levels can be expected to be reduced by 5 - 10 dBA. Applying a conservative reduction of 5dBA reduces the impact at NSR1 during the daytime element of Week 58 from **moderate adverse** to **negligible**.

5.11 Air quality

An assessment of the potential impacts on air quality within the Port and Holyhead Town arising from the construction and operation of the proposed scheme was undertaken in accordance with the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) guidance. This was supported by the collation of traffic data, meteorological data and dispersion modelling.

Following the application of best-practice dust minimisation and suppression techniques, all construction and operation air quality and odour impacts were assessed to be **not significant** for all human and ecological receptors.

5.12 Archaeology and cultural heritage

This assessment was informed by review of available information, supported by geophysical and geotechnical survey data. The assessment concluded potential impacts of **major/moderate adverse** significance could occur to known and potential heritage assets within the marine and intertidal zones. Mitigation including further archaeological investigation and monitoring during any pre-dredge clearance activities and the dredging campaign, including the implementation of a protocol for reporting finds of archaeological interest, is considered to reduce these impacts to **minor adverse** significance.

Direct impacts to onshore heritage assets (Admiralty Pier and Quay Wall) were assessed as being of **moderate adverse** and **minor adverse** significance (respectively). No mitigation was considered possible with respect to Admiralty Pier and the Quay Wall. For all other onshore assets, it was recommended that all landside construction works should be conducted in a controlled manner, with associated signage and temporary barriers where necessary to avoid any accidental damage or physical interactions occurring to other onshore heritage assets. This would avoid impacts to the remaining known terrestrial heritage assets.

No potential impacts on heritage assets were predicted though changes to coastal processes or to setting of heritage assets and the historic landscape and seascape character of the study area.

During the operation of the proposed scheme a potential impact of **moderate/major adverse** significance has been predicted to Admiralty Pier and Lighthouse through permanent changes to their form and setting. Mitigation by design has been embedded into the proposed scheme, including lowering the ground level of the Salt Island Expansion site, lowering the lighthouse wall to a maximum height of 5m aCD, no supporting the seaward side of the pier and to ensure the retention of visible links between assets. However, it was still considered that this impact would

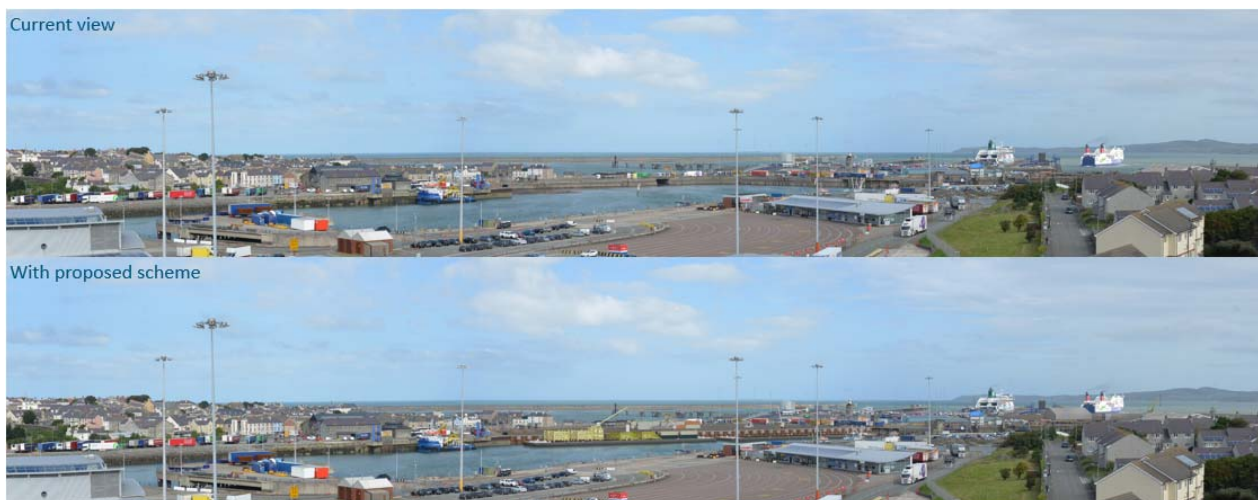
be of **moderate/major adverse** significance. Further consultation would be undertaken as part of the Listed Building Consent application for works associated with Admiralty Pier and Quay Wall, and the George IV arch for associated conditions to be agreed and incorporated into the final design.

5.13 Visual setting

The assessment focussed on the predicted visual effects of the proposed scheme, in accordance with guidance published by the Landscape Institute and the Institute of Environmental Management and Assessment. It was agreed that given the proposed scheme comprises the addition of port areas within an existing port that a full Landscape and Visual Impact Assessment was not required. Three viewpoints were selected to provide representative views of the proposed scheme from key sensitive areas. Photomontages of the proposed scheme from the three viewpoints can be seen below.



Viewpoint 1 - Before and after view of Proposed Holyhead Port Expansion, looking north west from the Isle of Anglesey Coastal Path, near properties at Peibio Close.



Viewpoint 2 - Before and after view of Proposed Holyhead Port Expansion, looking north from Skinner's Monument, near properties at Harbour View.



Viewpoint 3 - Before and after view of Proposed Holyhead Port Expansion, looking south east from properties at Fair View, near the Isle of Anglesey Coastal Path.

Potential impacts to the visual setting during construction of the proposed scheme were predicted to be of **moderate adverse** significance during peak working periods for residents of Fair View. No other significant visual effects were identified during the construction stages. Best practice construction site measures, including those proposed to manage noise and air quality impacts, were considered to reduce this impact to **minor adverse** significance.

Potential impacts to the visual setting during the operational phase on the designated landscape, the coastal path and residential areas, were predicted to be of **minor adverse** to **negligible** significance as the proposed scheme would visually integrate with the existing port features.

5.14 Coastal defence and flood risk

This chapter of the ES presents the Flood Consequence Assessment that has been produced in accordance with Technical Advice Note 15. Due to the location of the proposed scheme (i.e. away from watercourses but on the coastline) the key flood risk has been identified as coastal/tidal only. The assessment concluded that the proposed scheme would not increase flood risk within the area and the flood risk to the finished proposed scheme was considered to be low.

5.15 Tourism and recreation

The identified potential impacts to recreational mariners and tourism operators, recreational fishers and anglers, bird watchers, ramblers and walkers and the general local tourism-based economy. The assessment concluded that, in general, the proposed construction and operation of the proposed scheme would have **minor** to **negligible** adverse impacts on tourism and recreation; however, given the

5.16 Socio-economics

The assessment on socio-economics was undertaken based on available data and the findings of the assessments undertaken for other topics within the ES. Construction phase impacts were predicted to be largely **beneficial** through increased jobs and the influx of workers renting rooms and spending money locally however, it was also identified that there could be some **negative** impacts, mainly associated with the increased demand placed on housing and services from an

influx of contractors. The operational phase of the proposed scheme was expected to result in significant **beneficial** benefits to individuals and the local community from the investment, creation of jobs as well as economic benefits from cruise ships for local tourism businesses (coaches, guides, etc.), visitor attractions and service providers.

5.17 Cumulative Impact Assessment

A Cumulative Impact Assessment (CIA) was undertaken on other projects that could result in cumulative impacts with the proposed scheme. The other projects included in the CIA were:

• Holyhead Waterfront Regeneration • Holyhead Marina • Penrhos Leisure Village (Land and Lakes) • West Anglesey Demonstration Zone • Anglesey Eco Park and Biomass Energy Centre • Holyhead Truckstop Hotel	• Caergeiliog – Short-Term Operating Reserve • Wyfla Newydd Nuclear Power Plant • Holyhead Deep Tidal Array (Minesto) • A 5MW solar farm on Anglesey • Coleg Menai Llangefni • M-Sparc
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The CIA concluded that there would be no cumulative impacts arising from the proposed scheme and any of the identified projects.

5.18 Water Framework Directive Compliance Assessment

A Water Framework Directive (WFD) compliance assessment was carried out in line with NRW guidance for assessing activities and projects for compliance with the WFD (OGN72) and the Environment Agency's Clearing the Waters for All guidance.

The assessment concluded that the proposed construction and operational activities associated with the proposed scheme would **not cause a deterioration** within the Holyhead Bay coastal waterbody or other interconnected water bodies. As a result, the scheme was considered to be compliant with WFD requirements.

5.19 Shadow Habitats Regulations Assessment

A Habitats Regulations Assessment (HRA) was undertaken to assess the potential impacts of the proposed scheme on European and Ramsar sites. Likely significant effects (LSE) were concluded for six European sites, specifically relating to their marine mammal interest features, and therefore were taken forward to Appropriate Assessment, to be carried out by the Competent Authority. These sites are the North Anglesey Marine/Gogledd Mon Forol Special Area of Conservation (SAC), West Wales Marine/Gorwellin Cymru Forol SAC, Bristol Channel Approaches/Dynesfeydd Mor Hafren SAC, Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC, Cardigan Bay/Bae Ceredigion SAC and Pembrokeshire Marine/Sir Benfro Forol SAC.

The information provided to support an Appropriate Assessment concluded that for all European sites, there would be **no adverse effect on site integrity** arising from the proposed scheme either alone or in-combination with other plans or projects.



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