Peterhead Smith Quay Extension

Environmental Assessment

Peterhead Port Authority (PPA)

Date: 24 November 2025

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Abbreviations

Term	Definition
AUD INJ	Auditory Injury
CD	Chart Datum
CEMP	Construction Environmental Management Plan
EA	Environmental Appraisal
EIA	Environmental Impact Assessment
EPS	European Protected Species
HF	High Frequency
HGV	Heavy Goods Vehicle
HRA	Habitat Regulations Appraisal
GEN	General Planning Principles
IEMA	Institute of Environmental Monitoring and Assessment
INTOG	Innovation and Targeted Oil & Gas
JNCC	Joint Nature Conservation Committee
LF	Low Frequency
MD-LOT	Marine Directorate – Licencing Operations Team
MHWS	Mean High Water Spring
MMO	Marine Mammal Observer
MPA	Marine Protected Area
MU	Management Units
MZ	Mitigation Zone
NMFS	National Marine Fisheries Service
NPF	National Planning Framework
ODEX	Overburden Drilling EXcentric
PAHs	Polycyclic Aromatic Hydrocarbons
PMF	Priority Marine Feature
PPA	Peterhead Port Authority
PW	Phocid Pinnipeds
RIAA	Report to Inform Appropriate Assessment
RMS	Root Mean Square
ROV	Remote Operated Vehicle
SAC	Special Area of Conservation
SEL	Shift Sound Exposure
SEPA	Scottish Environmental Protection Agency
SNMP	Scottish National Marine Plan
SPA	Special Protection Area
SPL	Sound Pressure Level
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
SMWWC	Scottish Marine Wildlife Watching Code
TNT	Trinitrotoluene
TTS	Temporary Threshold Shift
VHF	Very High Frequency
WCA	Wildlife and Countryside Act

1. Introduction

1.1.1 This Environmental Appraisal (EA) has been prepared to support construction and dredging Marine Licence applications for the Peterhead Port Authority (PPA) proposal to extend Smith Quay, situated within Peterhead Port (the Project). Figure 1.1 illustrates the location of the quay within Peterhead Port.

1.1.2 The extension to Smith Quay seeks to increase the capacity of the port, including to increase offshore renewable energy capabilities and future oil and gas decommissioning. Further detail on the need for the development, consideration of alternatives and construction plans is provided in Section 2.

1.1.3 Marine licences for the construction of the Project located below mean high water springs (MHWS) and associated capital dredging and disposal are sought under the Marine (Scotland) Act 2010. This EA supports the applications as required by the Marine Works (Environmental Impact Assessment (EIA) (Scotland) Regulations 2017.

Figure 1.1 Smith Quay location within Peterhead Port.

1.2. Objective

1.2.1 The objective of this EA is to:

- Explain the project need and alternatives considered;
- Provide a description of the Project including features of the works incorporated to avoid, prevent or reduce significant adverse effects on the environment;
- Understand the environmental baseline for the proposed development area;
- Identify the potential direct, indirect, and cumulative effects on the environment associated with the development;
- Assess the significance of the potential impacts on the environment;

- Identify appropriate measures/mitigation to avoid, prevent or reduce adverse impacts and to maximise benefits; and
- Provide an appropriate level of detail to inform the Marine Licence decision making process.

1.3. EIA Screening and Scoping

1.3.1 An EIA screening request was sent to the Marine Directorate – Licencing Operations Team (MD-LOT) to determine if a full EIA was required for this work. The Scottish Ministers concluded that the project is not an EIA project under the 2017 MW Regulations.

1.3.2 Within the Screening Report, a scoping exercise was undertaken to determine the relevant pressures associated with the Project which have potential to impact the identified receptors. This process and the statutory responses are detailed in Section 4.

2. Project Description

2.1. Background

2.1.1 This section outlines the main elements of the development, and the activities required for construction and operation of the proposed extension.

2.1.2 The existing Smith Quay came into service in October 2010 and has a width of 40 m, an adjacent working area of 16,000 m^2, and a water depth of 10 m below chart datum (CD). By October 2010, 100,000 m^3 of rock and soft materials were dredged and suitable material was combined with imported material to construct 9,000 m^2 of reclamation behind the quay 1. An additional 32,000 m^2 of reclaimed land was added to the west of Smith Quay in 2018 coming from the harbour deepening project.

2.2. Summary of the Proposed Development

2.2.1 PPA propose an up to 85 m extension to the western end of the existing 120 m long Smith Quay (Figure 2.1). The works planned for this extension compromise:

- Demolition of the concrete deck of an existing berthing dolphin, with the dolphin's supporting tubular steel piles cut-off at bed level and removed;
- Partial demolition of a concrete wing wall at the west end of the existing quay;
- Removal and re-use of revetment rock armour adjacent to the west end of the existing quay;
- Quay extension comprising a concrete deck supported on tubular steel piles;
- Rock revetment beneath the quay extension;
- New mooring dolphin comprising a concrete deck supported on tubular steel piles;
- New/repurposed steel access bridge spanning between quay extension and new dolphin;
- Deck furniture;
- Area of reclamation; and
- Capital dredging to enlarge the existing berth pocket.

[1] Peterhead Port Authority: https://www.peterheadport.co.uk/areas/smith-embankment [Accessed April 2025]

2.2.2 Table 2-1 provides information on the maximum design scenario for key project design parameters.

Table 2-1 Key project design parameters

Parameters	Maximum Design Scenario
Quay dimensions	Up to 85 m long and 25.25 m wide. Most likely scenario is 83.25 m long.
Piles	A more traditional multi-piled quay, up to 84, typically 1.1m diameter piles (up to 85 No. piles assessed in the Environmental Appraisal, based on 1.1 m (1.067 m) diameter piles in noise modelling). Most likely scenario is 68 No. Quay, 4 No. Dolphin permanent piles.
Dolphin use & Position	A Mooring Dolphin positioned up to ~30 m from west of Quay, and set back from the berthing line.
Dredging extents	Total dredge volume under 25,000 m^3. Apart from the existing dredge pocket, which has silted up, further dredging may be required under the new dolphin and quay to remove structurally unsuitable material. The ground survey indicated a lower rock head, resulting in a decreased requirement for pre-treatment, including use of Cardox (described as blasting in noise modelling report, but note that this is a non-explosive method).
Reclamation Area	Up to 3,500 m^2.
Eastern Revetment	As shown on the updated drawing (Figure 2.1) oriented slightly to the west as it runs landward.
Overall site area	Maximum extent indicated by the red line (Figure 2.1). Up to 1.3 hectares, including underwater dredge slopes and with a percentage of the total area reclaimed over already developed ground on the existing revetment above MHWS.

2.2.3 These works are detailed in Section 2.4. The circa 67 week construction programme with an anticipated construction start date of March 2026, and completion in August 2027 is further detailed in Section 2.6. The final schedule is subject to receipt of necessary approvals.

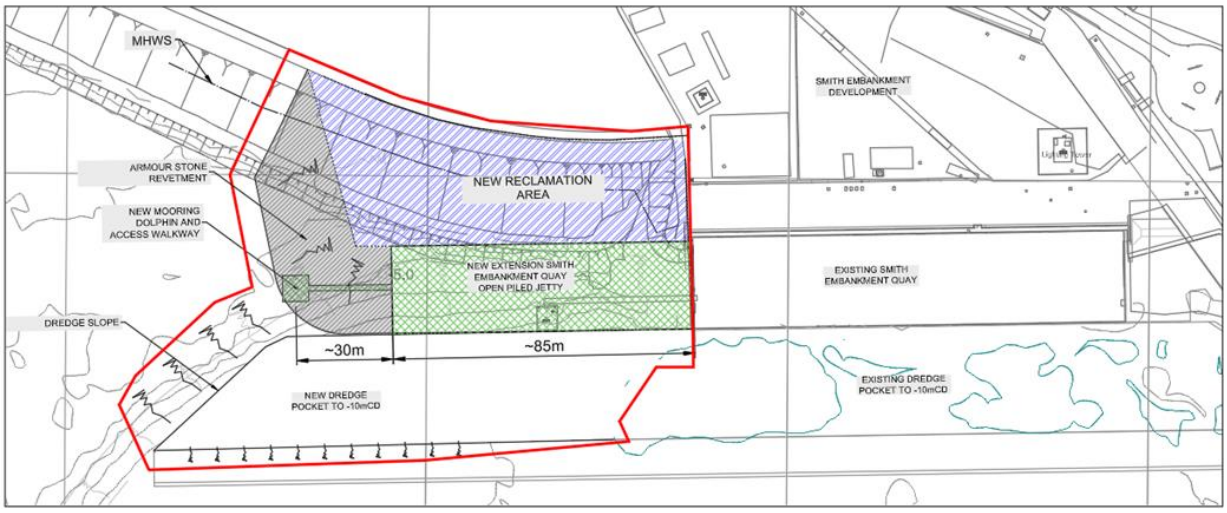

Figure 2.1 Proposed extension of Smith Quay.

Project Need

2.2.1 The objective of the Project is to facilitate sustainable economic growth by serving several diverse sectors on the east coast of Scotland.

2.2.2 Smith Quay is used by many industries, such as the pelagic fishing sector, renewable energy, oil and gas decommissioning, subsea construction and maintenance industry, and ship repair facilities. The proposed extension will provide vital additional berthing capacity and deck space with adjacent laydown area for this busy port, enhancing the area economically and further supporting the decommissioning of oil and gas, as well as supporting increased renewable energy routes.

2.2.3 The port is geographically well positioned to provide vessel support through its qualified personnel, pilotage, radar and radio monitoring, weather forecasts and berth requests, with a large 16,000 m^2 working area and 32,000 m^2 of reclaimed land to the immediate west, a total of 67,000 m^2 will be available including the 5,000 m^2 reclaimed as part of the extension. The port has built up skills over the last five decades in the energy sector which will support offshore wind, hydrogen and carbon captures, and has previously accommodated floating cranes with a maximum lifting capacity of 5,000 t and barges that transported turbine foundations.

2.2.4 The Proposed development will substantially increase the deck capacity of the Smith Quay from 3 T/m^2 to 10 T/m^2, and extent to accommodate vessels of up to 200 m in length. Increasing the deck capacity is well aligned to supporting major maritime project opportunities and increases in vessel size; for example, 25 GW of offshore renewables expected to be developed in Scotland over the next decade through Scotwind (Crown Estate Scotland, 2023) and the Sectoral Marine Plan for Offshore Wind for Innovation and Targeted

Oil and Gas (INTOG) (Scottish Government, 2022) and over 470 offshore installations that may require decommissioning over the next 20 years (PPA, n.d.).

2.2.5 The project is further discussed with regards to Scottish National Marine Plan (SNMP) in Section 3.

2.3. Consideration of Alternatives

2.3.1 A number of alternatives were considered detailed below.

No Action

2.3.2 Option 1 is for no construction activity to occur and for Smith Quay to remain as it is. As discussed in Section 3.0, there is a strong need for the extension and the proposed works are in line with the requirements of SNMP, increasing capabilities in renewable energy, oil and gas decommissioning, and other industries and thus improving the economic value and growth of the port. Therefore, no action is not a viable option for this project.

Different Construction Programme

2.3.3 The construction schedule for the Project has undergone several revisions since its inception. The current programme is significantly shorter than the original plan; originally the programme was due to be carried out over 117 weeks, whereas now the programme is to be carried out over 67 weeks, due to changes in methodologies and construction sequencing. This change reduces the potential impacts discussed in Section 2.4.

Alternative New Quay

2.3.4 Alternative locations were explored by PPA, which included a new quay being constructed elsewhere within the port. These options were discounted due to their significant cost both monetarily and in terms of operations as they would significantly impact operational activity within the port. In addition, a new quay would cause significantly more environmental impact than an extension of an existing quay, both in the marine environment and on land. A new quay would involve demolition of large areas on land and habitat loss and disturbance in the marine environment to facilitate a 200 m quay, resulting in environmental damage and extensive costs. As such, this option was not seen as a viable alternative.

Current Scenario

2.3.5 The current scenario has been deemed the best option based on cost, operational constraints, and assessment of the environmental impact, as outlined in this EA.

2.4. Project Components

Dredging Operations

2.4.1 The dredging sequence and methodology outlined below may be subject to further development.

2.4.2 The first activity to be undertaken on site will be dredging to -10 m CD, to form an enlarged dredged pocket, including the dredging of the rock trench for toe of the new revetment (Figure 2.2). Both the rock trench and dredge pocket are anticipated to be completed using a backhoe dredger, plough dredging may be necessary on completion. If necessary, pre-

treatment using underwater hydraulic attachment and/or Cardox rock breaking may be applied.

2.4.3 Sea disposal of dredge arisings at a licenced site is anticipated (application will be completed separately). The rock trench is required to be dredged prior to the pile installation, to eliminate the risk of pile damage from dredging the trench.

Figure 2.2 Proposed backhoe dredging of rock trench, berthing pocket, and approach.

Site Clearance and Demolition

2.4.4 Demolition will include the removal of an existing berthing dolphin, footbridge and rock armour and the partial removal of the existing west wing wall.

2.4.5 Rock armour which requires to be removed, will be left in-situ for as long as possible to minimise the period of exposure of the un-armoured length of revetment to wave action. The rock armour removed will be set aside for re-use in the Works.

2.4.6 Following removal of sufficient rock armour adjacent to the west wing wall, the wing wall will be partly demolished down to a level necessary to avoid obstructing construction of the extension structure immediately adjacent to the wing wall, using combination of concrete coring equipment, wire saws and hydraulic breakers.

2.4.7 The existing steel footbridge will be removed in one piece by a land based crane. The existing berthing dolphin will be demolished in situ, using a combination of a barge mounted crane or long reach excavator with hydraulic breaker, supported by a shore based crane. The concrete deck will be broken into smaller sections and recovered to land for processing. Where concrete sections drop onto seabed, these will be recovered from the seabed and transferred to land for recycling or disposal.

Piling

Seaward Bearing Piles

2.4.8 There will be 72 No. permanent vertical steel tubular piles in total in the quay extension and new mooring dolphin. An indicative arrangement is shown in Figure 2.3. Some temporary piles

and structural steel bracing members may be necessary to support the initial pile installation works in the temporary condition and will be removed on completion of the works

2.4.9 All piles will require a combination of rock drilling and driving to achieve the required embedment depth and capacity. All piles will be filled with concrete.

2.4.10 To achieve the required deck load capacity of 10 tonnes/m^2, the piles will be up to 1100 mm in diameter and will be embedded into sockets up to 10 m long drilled in rock and then concreted.

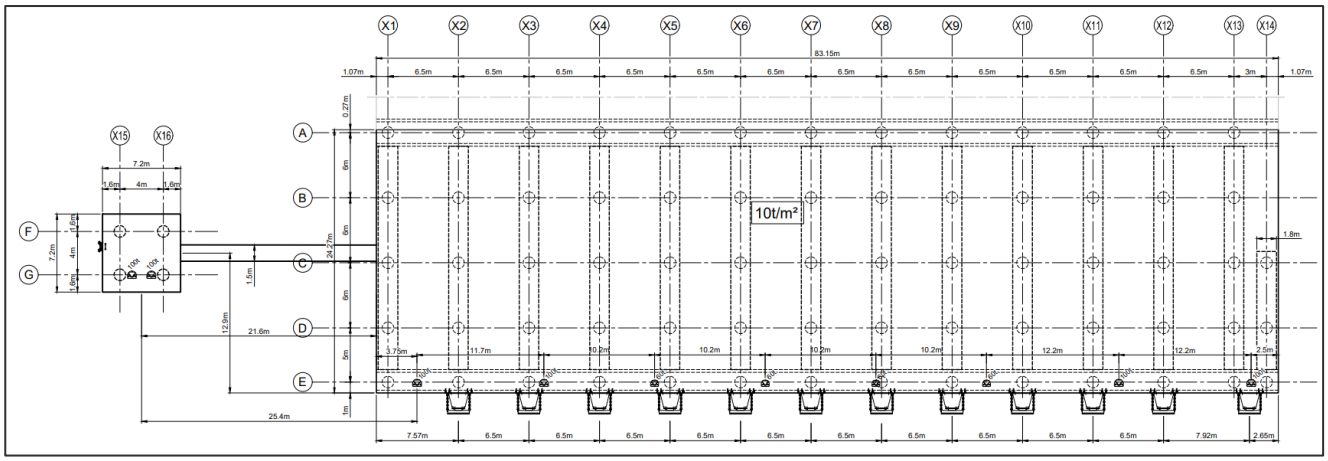

Figure 2.3 Smith Quay General Arrangement showing proposed pile layout.

2.4.11 The pile installation sequence and methodology outlined below will be subject to further development and is indicative at this stage.

2.4.12 The three seaward pile rows may be installed first, with the drilling rig located on the existing Smith Quay. Primary and underlayer rock armour will be removed in advance using a long-reach excavator working from the existing Smith Quay. A crawler crane will pitch the pile into the pile gate, the drilling rig will then place the tooling inside the tubular pile and advance the drill head to achieve the required rock socket depth.

2.4.13 A reinforcement cage or structural steel member will then be placed prior to concrete filling the rock sockets and piles. The crawler crane will either be land based or mounted on a barge as shown in Figure 2.4, which illustrates both the initial pile installation process and the removal of the existing dolphin's concrete deck.

Figure 2.4 Initial pile install working from Smith Quay.

2.4.14 Following installation of the first 3 piles, the drill rig will be transferred onto the jack-up barge or temporary works platform and secured in position. The crawler crane will be located on a spud leg barge or temporary works platform, which will be used to transport piles from the quay to the pile location (Figure 2.5). The crawler crane will pitch the piles into the pile gate, cantilevered over the edge of the jack-up barge / temporary works platform. The drill rig will then advance the rock socket, prior to concrete filling the rock sockets and piles.

Figure 2.5 Pile installation from jack-up barge.

2.4.15 The pile install method will continue along the full length of the works.

Revetment Works

2.4.16 The revetment construction sequence and methodology outlined below may be subject to further development.

2.4.17 With the seaward piles sufficiently progressed, existing primary rock armour will be removed using a long reach excavator and stored on site for reuse in the permanent works. Rock core material will then be imported to site by road and placed in front of the existing rock core to advance the new revetment structure. Core material will be placed using a long reach excavator, working from the Smith Quay Embankment, initially placing material adjacent to the existing Smith Quay and working westward.

2.4.18 The placed revetment core material may be utilised as a working platform to install the landward two rows of piles. With the revetment core progressed, primary armour will be placed along the extent of the revetment to provide protection from wave action. The primary armour will be placed along the revetment slope, keeping the rear berm clear to allow pile installation through the revetment core.

2.4.19 While the rock armour is being placed, the piling equipment will be utilised to install the mooring dolphin piles working from the jack-up barge / temporary works platform.

Landward Bearing Piles

2.4.20 The pile installation sequence and methodology outlined below may be subject to further development.

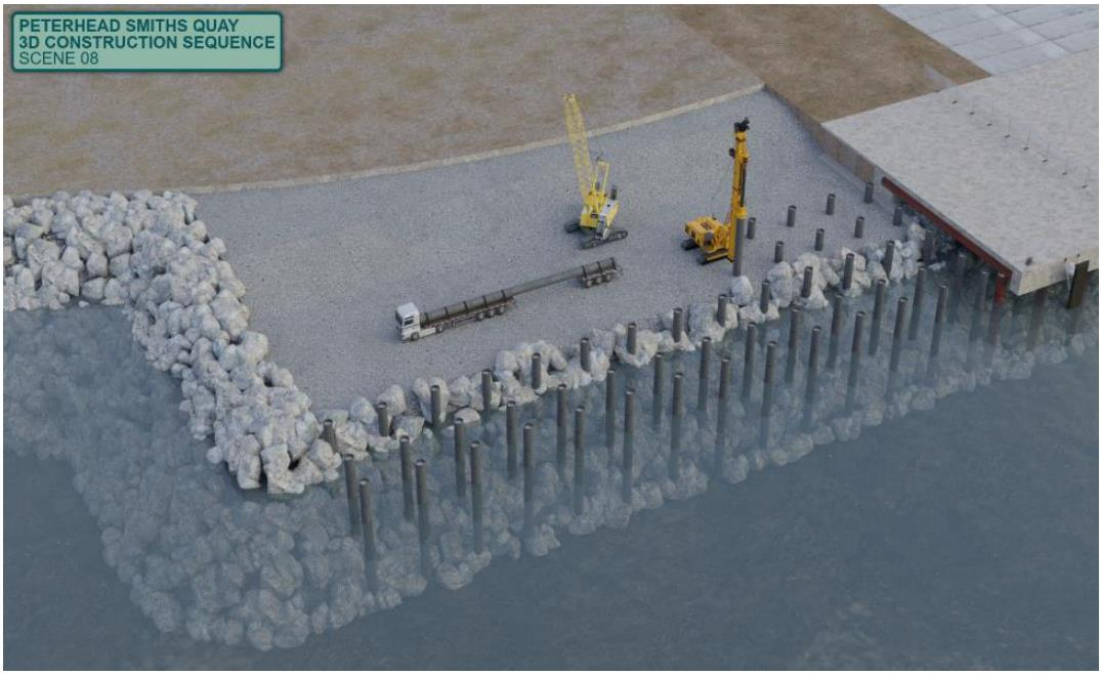

Figure 2.6 Install of pile rows A & B using land-based equipment.

2.4.21 The landward pile rows may be installed using land-based equipment. The new revetment core material will be used as a temporary working platform, with the platform raised above MHWS to allow pile installation during all states of the tide. The drill rig and crawler crane will be mobilised onto the core material. The crawler crane will pitch piles into the piling gate and the drill rig will then advance the drill head to achieve the required rock socket depth. The rock sockets and piles will then be concrete filled. Pile heads will be cut to required level using burning equipment. The process will be repeated for subsequent pile installations. Figure 2.6 illustrates the installation of these piles.

Seaward Piles and Landward Piles - Alternative Methodology

2.4.22 As a potential alternative to the pile installation methodology outlined above, a "land-based" piling method which does not require marine plant is currently being explored and is dependant on final Contractor award.

2.4.23 The alternative would enable all piles to be installed from a temporary platform supported on two of the rows of permanent piles. The piles and platform would progressively extend westwards "hand over hand" from the existing quay. Installed piles would be used to support a temporary working platform, allowing the pile drilling equipment to transverse and install subsequent piles, as illustrated in Figure 2.7. Both installation methods will be progressed in parallel.

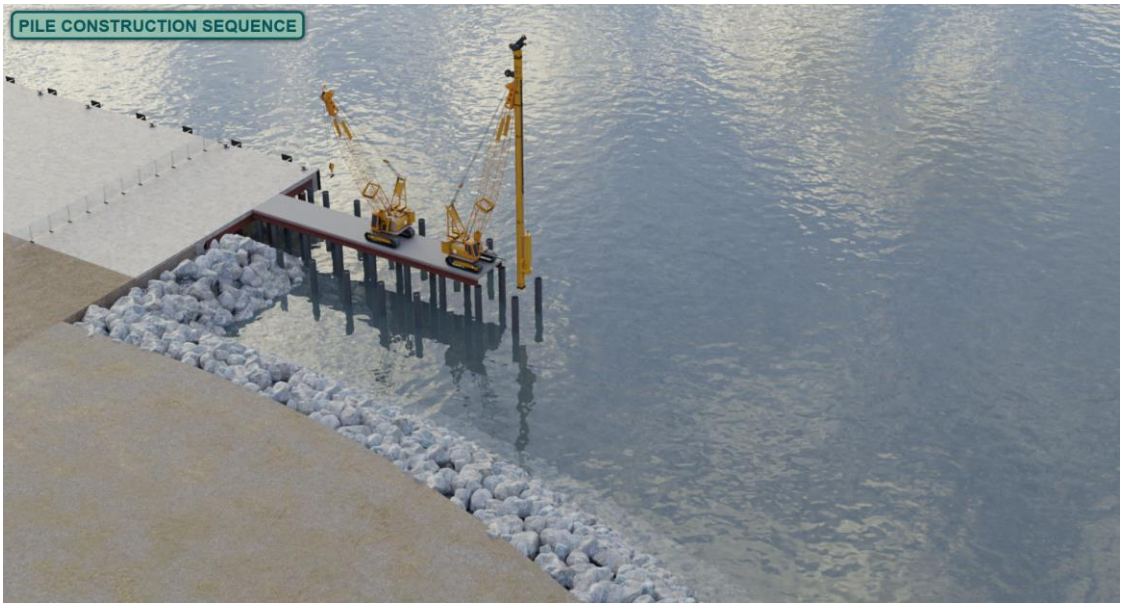

Figure 2.7 Pile installation from temporary working platform.

2.4.24 A similar alternative installation methodology for the new mooring dolphin piles is currently being developed. This method would require the temporary platform to be extended west of gridline X1 using temporary piles, which would be extracted upon completion of the new build dolphin works.

Deck Construction

2.4.25 Following installation of the piles and cutting of the pile heads to the correct level, precast concrete elements will be placed to form quay beams and deck. Precast beam elements will be installed in sequence, with cope beam and rear downstand beam installed, prior to transverse beams being placed in between. The beams will be placed in sections and will consist of pre-cast concrete 'U-shaped' troughs supported on the permanent piles and infilled with in-situ reinforced concrete. The connection between the beams and supporting piles will made by reinforcement protruding from the top of the concrete filled piles into the in-situ part of the beams. The process will be completed along the length of the structure, installing cope beam, rear downstand beam and transverse beams in sequence.

2.4.26 As the transverse beams are constructed and the in-situ concrete in them has developed the required strength, pre-cast concrete planks will be placed, spanning between the transverse beams. The planks will be pre-cast with protruding stirrups made from reinforcing bars, to ensure that the planks act compositely with the in-situ concrete to be placed on top of them.

2.4.27 A mat of reinforcement will be fixed on top of the beams and planks and in-situ concrete slab constructed. Figure 2.8 demonstrates the general sequence of works working west from the existing Smith Quay.

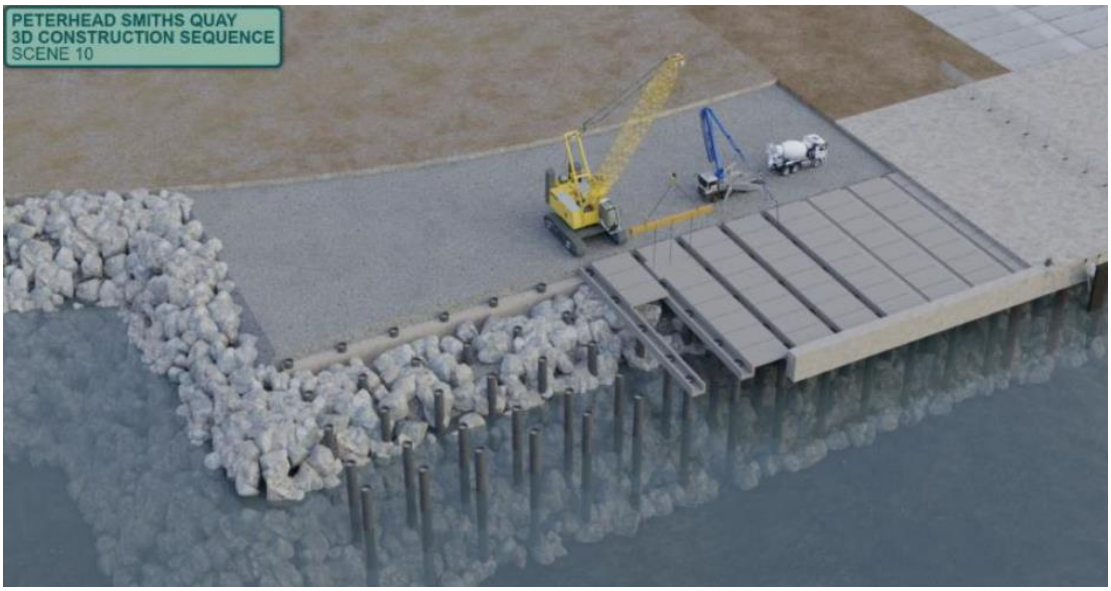

Figure 2.8 Placement of trough beams and precast deck planks.

2.4.28 Ducts will be incorporated within the deck structure to allow for future install of quayside services, such as power and water. On completion of the deck structure, quay furniture including ladders, grab chains, bollards and fenders will be installed.

Mooring Dolphin and Footbridge

2.4.29 A pile installation method similar to that for the quay extension method may be used to install the vertical piles for the new mooring dolphin, using the drilling rig working from the jack-up

barge or an alternative land-based approach. Temporary support piles may be required to facilitate installation.

2.4.30 Once the rock-socketed piles are installed, temporary works would be constructed as falsework and formwork to support the in-situ concrete pour which will be the deck of the new dolphin.

2.4.31 Quay furniture including bollards, ladder and handrailing will be installed, including reinstatement of navigation aids and lighting.

2.4.32 Following completion of the dolphin structure, the walkway will be reinstated providing access from Smith Quay to the dolphin.

2.5. Operational and Decommissioning Phase

2.5.1 The planned operation of the site involves the same vessel movements and site operations allowed under the current Harbour Revision Order, including the passage of vessels over 1,350 tonnes. No deviation from this is expected.

2.5.2 An expected timeline for the quay's operational phase can be estimated as 50 years for a project of this type. Assessments on the decommissioning impacts will need to be undertaken within an appropriate period before any decommissioning commences. Accordingly, only construction activities and their effects will be considered in this assessment.

2.6. Programme

2.6.1 The construction programme is summarised in Table 2-2, as based on a Pre-construction Services Delivery Agreement Contract Award of 01 April 2025. This assumes Engineering Construction Contract award in January 2026. Site access is scheduled for March 2026. The final schedule is subject to receipt of necessary approvals.

Table 2-2 Estimated Construction Schedule.

Activity	Duration	Start	Finish
Detailed Design	9 months	January 2025	October 2025
Consents	18 Months	October 2024	March 2026
Procurement	9 Months	January 2026	September 2026
Construction	16 Months	April2026	August - December 2027

2.6.2 A high-level construction sequence, and indicative timings, is provided below. These activities will not necessarily be carried out consecutively and may be undertaken partially or wholly in parallel:

- Dredging and demolition: 11 weeks (dredging 7 weeks, of which 5 weeks could include rock breaking)
- Revetment works: 12 weeks

- Suspended Jetty: 44 weeks, which includes:
  - Marine & land based piling: 23 weeks (around 4 hours of drilling and a few minutes of piling every other day- piling on approximately 81 days)
  - Concrete works: 20 weeks
- Quay furniture and footbridge: 8 weeks
- Dolphin works: 30 weeks (in parallel to suspended jetty works).

3. Statutory Context and Policy

3.1. Introduction

3.1.1 This section provides a summary of the statutory requirements for the Project, as well as highlighting the policies that may apply to the determination of the Marine Licence. Statutory requirements specific to environmental receptors are introduced here but may be expanded upon within the thematic assessment chapters where necessary.

3.1.2 In particular, there is a need to identify all legally protected species that could be affected by the proposed development, to ensure that the development complies with all relevant nature conservation legislation. It is, therefore, appropriate to take into full consideration the legal protection of a species within the evaluation process.

3.2. Marine Licence

The Marine (Scotland) Act 2010

3.2.1 The act contains provisions for new Marine Protected Areas (MPAs) in Scottish territorial waters and sets out duties to ensure Scotland's seas are managed sustainably.

3.2.2 In order to help meet this requirement, the Joint Nature Conservation Committee (JNCC) and NatureScot (previously Scottish Natural Heritage) produced a list of habitats and species occurring in Scottish waters which are noted for their conservation importance; these are referred to as Priority Marine Features (PMFs).

3.2.3 Under the Marine (Scotland) Act 2010 a number of activities listed in Part 4, Section 21 of the Act require a Marine Licence issued by the MD-LOT. This includes any activity where the project intends to do any of the following below the MHWS:

- Deposit or remove substances or objects in the sea either on or under the seabed;
- Construct/alter/improve any works in or over the sea or on or under the seabed;
- Remove substances or objects from the seabed; or
- Dredging activity.

3.2.4 Several of the construction activities are seaward of the MHWS and hence will require a Marine Licence. In addition, there will be a requirement for dredging and deposition of material at sea, which also requires a Marine Licence. Hence two marine licence applications will be submitted.

3.3. Environmental Impact Assessment

3.3.1 Notwithstanding that full EIA is not required (see Section 1.3) the application and this supporting EA has regard to the EIA regulations governing land and marine works, specifically:

1. The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended);
2. The Harbours Act 1964 ("the 1964 Act") – Transport Scotland will determine the grant of a Harbour Revision Order to empower PPA to undertake the proposed works; and
3. The Town and Country Planning (Scotland) (Environmental Impact Assessment) Regulations 2017 – if required, the application for Planning Permission will be determined by Aberdeenshire Council.

3.4. National Regulations

The Habitats Directive

3.4.1 The European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, also referred to as the 'Habitats Directive' (Office Journal of the European Communities, 1992) has the primary aim of maintaining biodiversity within the Member States.

3.4.2 The Habitats Directive is transposed into Scottish law by a combination of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland), commonly known as the 'Habitats Regulations' together with the Habitats Regulations 2010 (in relation to reserved matters).

3.4.3 The Habitats Regulations identify several habitats or species whose conservation interest requires the designation of Special Areas of Conservation (UK Marine SAC Project), which form the Natura 2000 network of protected sites.

3.4.4 In addition, the Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licenses by the appropriate authorities. These species are commonly termed European Protected Species (EPS).

3.4.5 Information the competent authority requires in order to carry out an Habitat Regulations Appraisal (HRA) and Appropriate Assessment has been provided separately to this EA report in the form of the HRA Screening Report (NIRAS, 2025a) and the Report to Inform Appropriate Assessment (RIAA) and MPA Assessment (NIRAS, 2025b).

Wildlife and Countryside Act 1981 (as amended) & Nature Conservation (Scotland) Act 2004

3.4.6 The Wildlife and Countryside Act 1981 (WCA) (as amended in Scotland) was originally conceived to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and the European Birds Directive in Great Britain. It has been extensively amended since it first came into force. Schedule 5 of the WCA provides special protection to selected animal species other than birds, through section 9(4) of the Act, against damage to "*any structure or place which [any wild animal included in the*

schedule] uses for shelter and protection", and against causing disturbance whilst in such places.

3.4.7 The WCA contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9. It also provides a mechanism making the above offences legal through the granting of licenses by the appropriate authorities.

3.4.8 Important amendments to the WCA have been introduced in Scotland including the Nature Conservation (Scotland) Act 2004 (in Scotland). Part 3 and Schedule 6 of this Act make amendments to the WCA, strengthening the legal protection for threatened species. The Nature Conservation (Scotland) Act 2004 (in Scotland) is also the instrument under which Sites of Special Scientific Interest (SSSI) are protected in Scotland.

3.5. Environmental Designations

3.5.1 Designated protected areas are important for the conservation of landscapes, flora, fauna, geology, and fossils. The aim of designation is to ensure the protection and continued management of these sites for current and future generations. Designated sites are be done so on an international, national, or more local basis. This section details the types of designated sites screened in for this application.

International Designations

Natura Sites

3.5.2 Natura Sites include those which make up the Natura 2000 network as part of the Habitats Directive and Birds Directive. Sites included in the Natura 2000 network are Special Protected Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites, although the latter are included as part of SPAs or SACs in Scotland.

3.5.3 SACs are internationally important for threatened habitats and species. They are also selected for a number of habitats and species, both terrestrial and marine, which are listed in the Habitats Directive. Where a potential site to be designated as a SAC has been identified, and the details of that site have been put out to public consultation, it is referred to as a candidate SAC (cSAC); cSACs are afforded full legislative protection, and as such will be considered to have equal value as SACs.

3.5.4 SPAs are internationally important for threatened habitats and species. They are also selected for a number of rare, threatened or vulnerable bird species listed in Annex I of the Birds Directive, and also for regularly occurring migratory species.

3.5.5 UK sites are no longer part of the EU's Natura 2000 network, instead forming a national network of protected sites. Key terminology is primarily unchanged, with the terms 'European site', 'European marine site', 'European offshore marine site', 'Special Area of Conservation (SAC)' and 'Special Protection Area (SPA)' all being retained. The Habitats Regulations have been amended as a result of the UK leaving the EU in the 'The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019'.

Ramsar Sites

3.5.6 Ramsar sites are wetlands of international importance, designated under the Ramsar Convention. Wetlands are defined as areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.

3.5.7 All Ramsar sites in Scotland are also either SPAs or SACs, and many are also SSSIs, although the boundaries of the different designations are not always exactly the same (Scottish Natural Heritage, 2017).

National Designations

Sites of Special Scientific Interest

3.5.8 SSSI are those areas of land and water (to the seaward limits of local authority areas), that NatureScot considers to best represent our natural heritage; its diversity of plants, animals and habitats, rocks and landforms, or a combination of such natural features. They are the essential building blocks of Scotland's protected areas for nature conservation. Many are also designated as European sites (SPAs and SACs). The national network of SSSIs in Scotland forms part of the wider Great Britain series. NatureScot designates SSSIs under the Nature Conservation (Scotland) Act 2004. SSSIs are protected by law. It is an offence for any person to intentionally or recklessly damage the protected natural features of an SSSI.

Marine Protected Areas

3.5.9 Scotland (along with the rest of the UK) has designated a number of MPAs which include SACs and SSSIs. The term “MPA" can be used for several different types of protected areas within the marine environment. The Marine (Scotland) Act has established a new power for MPAs in the seas around Scotland, to recognise features of national importance and meet international commitments for developing a network of MPAs.

Seal Haul-out Sites

3.5.10 Under Section 117 of the Marine (Scotland) Act 2010, Scottish Ministers, consulting with the Natural Environment Research Council, are permitted to designate specific seal haul-out sites to provide additional protection for seals from intentional or reckless harassment. There are currently 194 seal haul-out sites in Scotland[2].

3.5.11 The Marine (Scotland) Act 2010 protects both seal species found around Scotland’s coast – the harbour seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*). Seal haul-outs are locations on land where seals come ashore to rest, moult or breed. It is an offence to intentionally or recklessly kill, injure or take a seal at any time of year, except:

1. To alleviate suffering; and
2. Where Marine Scotland has issued a licence to do so.

3.6. Planning Context

[2]Seal Haul-out Sites: https://www.gov.scot/policies/marine-environment/seal-haul-out-sites/ [Accessed May 2025].

Scottish National Marine Plan (SNMP)

3.6.1 The project falls within the remit of the Marine (Scotland) Act 2010 due to its location below MHWS and within 12 nautical miles of the Scottish coastline. The 2015 SNMP covering inshore waters is a requirement of the Act. The SNMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs), most of which apply to the construction and operations of Smith Quay. Many GENs are specific to environmental topics; these are identified in Table 3-1, along with the considerations made during design development in order to meet the requirements.

3.6.2 The first general principle relates to the sustainable development and use of the marine environment, where development is consistent with the other policies and objectives of the SNMP. The SNMP lays out sector specific objectives and policies, for shipping, ports, harbours, and ferries, as well as encouraging developments to contribute to increased use of renewable energy sources.

3.6.3 Table 3-2 details the objectives and relevant policies and how the Project contributes towards these.

Table 3-1 SNMP general principles which were considered during this project.

General Planning Principles	Requirements	Smith Quay Extension Considerations
GEN 2: Economic benefit	Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.	The Smith Quay Extension will provide additional capacity and berthing space to support further growth in the area. It allows for continued industrial activities in the area. This work is essential for the economic growth of Peterhead Port.
GEN 3: Social benefit	Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.	The increased capacity of the quay and potential to support marine renewables and oil and gas decommissioning will provide new job opportunities for the local community.
GEN 4: Co-existence	Proposals which enable coexistence with other development sectors and activities within the Scottish marine area are encouraged in planning and decision-making processes, when consistent with policies and objectives of this Plan.	The project construction methods have taken account of other possible developments occurring at the same time as the construction of the quay. Once operational Smith Quay will co-exist with other users of Peterhead Port.
GEN 6: Historic environment	Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.	There are no known heritage sites in the immediate area surrounding the planned works. The Construction Environmental Management Plan (CEMP) will also include a protocol for archaeological discoveries in case anything is found during the works
GEN 8: Coastal process and flooding	Developments and activities in the marine environment should be resilient to coastal change and flooding and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding.	The design of the Project took into account coastal processes and the wave climate of Peterhead Bay.

General Planning Principles	Requirements	Smith Quay Extension Considerations
GEN 9: Natural heritage	Development and use of the marine environment must: a) Comply with legal requirements for protected areas and protected species. b) Not result in significant impact on the national status of PMFs. c) Protect and, where appropriate, enhance the health of the marine area.	Ecological features of interest have been considered within this EA. Legal requirements have been taken into consideration throughout. Mitigation measures are outlined in section and concluded in Section 7. There are no significant residual impacts on any PMFs from the proposed development.
GEN 10: Invasive non-native species	Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.	The possible sources of invasive non-native species were investigated during the EA process. No such species were identified. Mitigation measures have been embedded into the design and construction process to minimise any chance of their introduction.
GEN 11: Marine litter	Developers, users, and those accessing the marine environment must take measures to address marine litter where appropriate. Reduction of litter must be taken into account by decision makers.	Potential sources of marine litter and measures to prevent it entering the marine environment will be detailed in the CEMP.
GEN 12: Water quality and resource	Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.	The Project is of small scale and no impact on water quality and resource is expected. Mitigations to prevent impact will be embedded in the construction phase and addressed in the CEMP.
GEN 13: Noise	Development and use in the marine environment should avoid significant adverse effects of human-caused noise and vibration, especially on species sensitive to such effects.	Underwater noise emissions from relevant construction activities have been investigated through modelling and an assessment

General Planning Principles	Requirements	Smith Quay Extension Considerations
		undertaken. Mitigations are presented in Section 5.2.
GEN 15: Planning alignment A	Marine and terrestrial plans should align to support marine and land-based components required by development and seek to facilitate appropriate access to the shore and sea.	The cumulative impacts of the Project on other plans were considered in the screening phase of this project. There are no other plans expected concurrently with this project.
GEN 17: Fairness	All marine interests will be treated with fairness and in a transparent manner when decisions are being made in the marine environment.	NIRAS has consulted relevant stakeholders during the development of the Marine Licence application. Consultation with the public is a requirement of the application process and documents are available for review.
GEN 19: Sound Evidence	Decision making in the marine environment will be based on sound scientific and socio-economic evidence.	Information in this EA is based on current scientific evidence to inform the decision-making process.
GEN 21: Cumulative impacts	Cumulative impacts affecting the ecosystem of the marine plan area should be addressed in decision making and plan implementation.	Cumulative impacts have been assessed throughout the assessment and application processes for this project. There are no projects expected to occur concurrently with this work.

Table 3-2 SNMP sector objectives and policy relevant to the Smith Quay Extension.

Objective/Policy	Requirements	Smith Quay Extension Considerations
Shipping, Ports, Harbours, and Ferries Objective 1	Safeguarded access to ports and harbours and navigational safety.	The construction method developed ensures access to Peterhead Port so that services can continue to operate safely

Objective/Policy	Requirements	Smith Quay Extension Considerations
		during the construction works and after completion of the project.
Shipping, Ports, Harbours, and Ferries Objective 2	Sustainable growth and development of ports and harbours as a competitive sector, maximising their potential to facilitate cargo movement, passenger movement and support other sectors.	Smith Quay will provide additional capacity and berthing space to support further growth in the area. It allows for continued industrial activities in the area. This work is essential for the economic growth of Peterhead Port.
TRANSPORT 4	Maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported in marine planning and decision making.	Peterhead Port services many different industries such as fisheries, oil and gas decommissioning, and marine renewables, and the extension to Smith Quay will further grow this capability.
RENEWABLES 7	Marine planners and decision makers should ensure infrastructure is fit for purpose now and in future. Consideration should be given to the potential for climate change impacts on coasts vulnerable to erosion.	Peterhead Port is an important port for the development of marine renewables, including offshore wind. Smith Quay will add berthing capacity to the port, further supporting renewable development, should the opportunity be presented.

Planning Policy

3.6.4 The main development policy documents relevant to this assessment include:

- The National Planning Framework (NPF);
- Scottish Planning Policy (SPP) (last published 2014);
- Strategic Development Plans produced for the Scotland's four largest cities; and
- Local Development Plans produced for each council area (Aberdeenshire Local Development Plan, 2023).

3.6.5 The most recent update to Scottish Planning Policy is reflected in the ongoing implementation and refinement of NPF4, which came into effect in February 2023. Since then, the Scottish Government has continued to issue updates and guidance to support its application.

3.6.6 As of April 2025, a progress update was published by the Chief Planner and the Minister for Public Finance. This update focused on several key areas, including:

- Flood risk and water management (Policy 22);
- Biodiversity enhancement (Policy 3b);
- Renewable energy infrastructure (Policy 11); and
- Continued work on Local Development Plans, with a target for all planning authorities to adopt new-style Local Development Plans by May 2028.

3.6.7 Planning Advice Notes and advice are provided by the Scottish Government to support the implementation of the underlying policy.

4. Methodology

4.1. Overview

4.1.1 This section sets out the process undertaken in order to provide a methodical and robust assessment of environmental impacts, which is used across all assessment sections of the EA and aligns to the legislative requirements.

4.2. Statutory Consultation

4.2.1 On 30/04/2024, an EIA Screening Request Report (NIRAS, 2024), seeking an opinion from the Marine Directorate as per Regulation 10(1) of the Marine Works (Environmental Impact Assessment (EIA)) (Amendment) Regulations 2017 ('EIA Regulations'), was issued to the MD-LOT to determine whether an EIA will be required to support the Marine Licence application for the proposed Smith Quay extension. The EIA Screening Request Report was also submitted to Transport Scotland to determine the grant of a Harbour Revision Order authorising PPA to carry out the proposed activities, in accordance with the 1964 Act.

4.2.2 Within the Screening Report, a scoping exercise was undertaken to determine the relevant pressures associated with the Project which have potential to impact the identified receptors. This process and the statutory responses are summarised below.

4.2.3 MD-LOT and Transport Scotland, on behalf of the Scottish Ministers, consulted with NatureScot, Scottish Environmental Protection Agency (SEPA), Aberdeenshire Council, and Historic Environment Scotland to determine if the proposed works are an EIA project.

4.2.4 On 10/07/24, Transport Scotland concluded confirmed that Scottish Ministers concluded that:

- The application relates to a project which is not of a type specified in Annex I;
- The application relates to a project which is of a type specified in paragraph 10(e) of Annex II to the EIA Directive, as the application relates to the construction of a port installation; and
- Having regard to the selection criteria, it is not a relevant project in terms of Schedule 3 to the 1964 Act.

4.2.5 Accordingly, an EIA is not required in terms of the 1964 Act.

4.2.6 On 18/07/2024, MD-LOT confirmed that the Scottish Ministers concluded that the proposed works are not an EIA project under paragraph 1(e) of schedule 2 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the 2017 MW Regulations"), and therefore, that an EIA would not be required.

4.2.7 NatureScot concluded that the scope of the EA be expanded to include Collieston to Whinnyfold Coast SSSI, Ythan Estuary, Sands of Forvie and Meikle Loch SPA (for common and sandwich terns), as well as Loch of Strathbeg SPA (sandwich terns). Furthermore, that HRA should consider the connectivity with the European sites Buchan Ness to Collieston Coast SPA, Ythan Estuary, Sands of Forvie and Meikle Loch SPA and Loch of Strathbeg SPA for breeding seabirds, minke whale in the Southern Trench MPA and bottlenose dolphin from the Moray Firth SAC.

4.2.8 SEPA concluded that the following topics be taken into account;

- Bathing Waters; to consider if bathing water designations were within 2 km of the site, and for works to take place outside of the bathing water season (1 June to 15 September) or to justify that they pose only a low risk if operations must take place within this period.
- Pollution prevention: from silt, chemicals, oil spills and to adopt good practices in minimising water pollution and disturbance. SEPA also recommended the use of biodegradable materials for sediment tracing studies. Tracing studies are not planned for this Project.
- Onshore-works and restoration: it was recommended to minimise shoreline disturbance and to restore it post works, to bury new infrastructure (such as septic tanks) where possible and to remove redundant structures.
- Dredge spoil was advised to be disposed of at offshore sites and to ensure that material disperses naturally below MHWS.
- SEPA consultation regarding disposal of waste material (including dredge spoil) above the low water mark was suggested, and it was stated that these are subject to Waste Management Licensing unless regulated by Marine Scotland.[3]

[3] Dredging and disposal of dredged materials has been assessed within the application for a Marine Licence.

4.2.9 Since the original screening opinion, and following results of ground investigation surveys, it has been necessary to make alterations to the proposed design of the Project. The altered design is detailed in Section 2.2, along with the full Project description in Section 2.4; however, a summary of key changes are as follows:

- A more traditional open piled construction methodology is required resulting in a larger number of smaller diameter piles.
- The length of the extended quay has increased from up to 80 m to up to 85 m. Current working design = 83.2 m.
- Moderate increases in area and extent are required to the reclamation area, western revetment and dredge volumes.

4.2.10 Following recent consultation with MD-LOT and Transport Scotland, it was concluded that the previously issued Screening Opinion is not valid in relation to the revised Project Description and that a new Screening Request should be submitted, in line with the requirements of the EIA Regulations. The new Screening Opinion received on 20/11/2025, re-validated that the Proposed Works do not constitute an 'EIA Development' according to the EIA Regulations and consequently a formal EIA is not considered to be necessary. The following opinions were received from the consultees:

- NatureScot advised that it's response to the original screening remained valid and had no additional comments to make.
- HES advised that it had not identified any significant impacts on the historic environment and do not consider the Proposed Works an EIA project.
- Aberdeenshire Council advised that it does not determine the Proposed Works to be an EIA project.
- SEPA advised that as per the SEPA standing advice for the Department for Business, Energy and Industrial Strategy and Marine Directorate on marine consultations they only respond to consultations for works in or adjacent to (within 2km) of a bathing water during pre-bathing and the bathing water season (15 May to 15 September) once justification for the works, monitoring and pollution prevention plans are provided, i.e., application rather than screening stage.

4.2.11 A separate consultation was undertaken with NatureScot with regards to EPS and licensing requirements. NatureScot advised that an EPS licence is required for the disturbance of inshore EPS during the Peterhead Smith Quay Extension works. However, a licence for injury to inshore EPS and for offshore EPS (injury or disturbance) is not necessary, provided that mitigation measures outlined in the Scottish Marine Wildlife Watching Code (SMWWC) and JNCC guidelines for piling and explosives are followed. Similarly, a licence for basking shark disturbance is not required if cetacean mitigation is applied to this species. An updated EPS Risk Assessment (NIRAS, 2025e) has been prepared to address comments received from NatureScot on the previous version, and to reflect changes to project plans such as revised pile design and programme.

4.2.12 Further detail was requested to allow the number of EPS potentially subject to disturbance to be calculated; specifically, NatureScot requested detailed data on the number of days during which potentially disturbing activities would take place. NatureScot also advised listing all species and noise-producing activities for the EPS license, as any disturbance (unless proven de minimis or affecting fewer than one animal) requires licensing for inshore works. EPS Risk Assessment (NIRAS, 2025e) considers all activities with potential to cause disturbance to EPS

which extends beyond the harbour limits, on the basis that EPS do not ordinarily occur within the harbour limits, and mitigation can be applied to reduce any residual risk to negligible levels.

4.2.13 NatureScot advised using the Graham *et al.* (2019) dose response method to estimate cetacean disturbance from piling and using Temporary Threshold Shift (TTS) as a proxy for animals disturbed by explosives. The dose response method has not been adopted since the pile installation method to be used, ODEX piling (percussive drilling followed by a short period (minutes) of piling to set each pile), is significantly less noisy than the offshore wind impulse piling referred to by Graham *et al.* (2019) and the empirical evidence presented by the authors from Beatric Offshore Wind Farm cannot be directly related to the project where predicted impact (disturbance) range and area are much smaller on account of the lower energy piling and configuration of the harbour entrance which limits sound propagation seawards. An implication of the approach taken is that the EPS Risk Assessment (NIRAS, 2025e) does not assume that EPS (specifically harbour porpoise in this case) will reducer over time, which may be over-precautionary.

4.2.14 The EPS Risk Assessment (NIRAS, 2025e) now also makes clear that no explosives will be used for rock breaking. The method considered (Cardox) uses rapid expansion of liquid CO_2 to fracture rock; in the absence of available information on the source noise level for Cardox use literature was referred to and a precautionary assumption made that this will be equivalent to a very small quantity (0.030 kg) of Trinitrotoluene (TNT). Relevant best practice measures from JNCC guidelines for explosives, such as use of the minimum charge size necessary, will be followed, and the mitigation zone (area monitored for EPS presence) will be appropriate to the scale of potential impact and location of works.

4.2.15 NatureScot's comments on the previous EPS Risk Assessment also included a request for additional information to assess potential impacts on the Moray Firth SAC and the Southern Trench MPA. The EPS Risk Assessment (NIRAS, 2025e) and the RIAA and MPA Assessment (NIRAS, 2025b) have not been clearly separated, and this request is addressed by the latter document.

4.3. Scoping

4.3.1 Taking into account the statutory consultee responses received above, the potential impacts scoped in to assessment for each receptor are summarised in Table 4-1 where the development phase when impacts could occur is identified (construction, operation or decommissioning). The impacts from decommissioning are expected to be equivalent to those during construction and as such are not further considered separately. The pressures relevant to each receptor were identified during scoping.

4.3.2 The RIAA and MPA Assessment (NIRAS, 2025b) assesses the potential effects on the integrity of European sites. Scoping concluded no potential adverse effects on other designated sites, therefore no further assessment in relation to designated sites is provided in this EA.

Table 4-1 Summary of scoping decisions for the pressures.

Receptor	Pressures scoped in to assessment (C=construction, O=operation, D=decommissioning)	Impacts scoped in to assessment
Public Amenity (Bathing Waters)	Release of suspended sediments (C,D)	Fine sediments mobilised by construction works could impact bathing water quality.
	Release of toxic contaminants (C,D)	Potential for mobilisation of contaminants in existing seabed sediments, should these be disturbed during construction works.
Public Amenity (Other topics) & socioeconomic considerations	Airborne noise from construction activities (C,D)	Potential for disturbance from noise generated during construction.
	Air quality impacts (C,O,D)	Previously scoped out, reinstated to ensure complete assessment of relevant issues.
	Road traffic (C,D)	Previously scoped out, reinstated to ensure complete assessment of relevant issues.
	Socioeconomic change (O)	Previously scoped out, reinstated to ensure complete assessment of relevant issues.
Benthic Habitats	Loss of habitats (O)	Potential loss up to 10,000 m^2 of seabed habitat will occur from extension of the quay.
	Release of toxic contaminants (C,D)	Potential for mobilisation of contaminants in existing seabed sediments, should these be disturbed during construction works.
	Sediment smothering (C,D)	Fine sediments mobilised by construction works could settle on benthic habitats, potentially

Receptor	Pressures scoped in to assessment (C=construction, O=operation, D=decommissioning)	Impacts scoped in to assessment
		smothering epifauana and epiflora.
Fish	Underwater noise from construction activities (C,D)	Potential for disturbance from underwater noise generated during construction.
	Release of toxic contaminants (C,D)	Potential for mobilisation of contaminants in existing seabed sediments, should these be disturbed during construction works.
Marine Mammals	Collision (C,O,D)	Potential for collision with increased number of construction vessels.
	Underwater noise from construction activities (C,D)	Potential for disturbance from underwater noise generated during construction.
	Underwater noise from vessel traffic (C,O,D)	Potential for disturbance from underwater noise generated from construction vessels.
	Release of toxic contaminants (C,D)	Potential for mobilisation of contaminants in existing seabed sediments, should these be disturbed during construction works.
	Habitat Loss (O)	Project area is small scale and unlikely to impact marine mammals.
Marine Ornithology	Physical disturbance/displacement from construction activities (C,D)	Potential for disturbance from noise and/or physical presence of vessels and equipment, including lighting, during construction.
	Water quality (C,D)	Potential for turbidity effects to affect foraging, or mobilisation of contaminants in seabed

Receptor	Pressures scoped in to assessment (C=construction, O=operation, D=decommissioning)	Impacts scoped in to assessment
		sediments to affect birds should these be disturbed during construction works.
Terrestrial Habitats	Scoped out: there will be no direct impact to terrestrial habitats and no significant remote or indirect impacts are anticipated.	
Terrestrial Ornithology	Scoped out: there will be no direct impact to terrestrial ornithology and no significant remote or indirect impacts are anticipated.	
Cultural Heritage & Archaeology	Scoped out: no cultural heritage or archaeological assessments have been identified, and the proposed development will take place in a busy port environment.	
Landscape and Visual Impact	Scoped out: the existing landscape and visual character will not be changed significantly by the proposed development as the works will take place in a busy port environment.	

4.4. Baseline Description

4.4.1 Baseline conditions have been described for each of the topic areas scoped into the assessment. The following sources were used to compile each baseline;

- Desk based studies: based on publicly available reports and scientific data;
- Field survey: a benthic habitat survey; and
- Underwater noise modelling involving numerical propagation modelling and estimation of biological effects.

4.4.2 Detail on the sources of data used and methods applied for each topic are available within relevant topic sections.

4.4.3 The baseline information is utilised to create an understanding of the value of each receptor, and its sensitivity to the pressures associated with the Project. This information is then utilised to evaluate the significance of impacts using the methodology set out in the next section.

4.5. Assessment Methodology

4.5.1 The evaluation methodology was adapted from the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018). For each of the environmental topics assessed, the appropriate professional guidelines for EIA were applied and followed, along with any other relevant guidance documents and best

practice techniques. The assessment criteria applied to this EA are also detailed within this section.

4.5.2 The assessment identified the origins of the environmental impacts from the project and predicted their effects on receptors. A receptor is any environmental or other defined feature (e.g. human beings) that is sensitive to, or has the potential to be, affected by an impact.

4.5.3 The environmental assessment was conducted in two stages. The first stage characterised the nature of the impacts; it described the receptors present (their spatial and temporal patterns and sensitivity to environmental changes) and the pressures arising from project activities (their spatial and temporal patterns and magnitude). The second stage determined the level of significance of effects. An effect results from the consequences of a pressure acting on a receptor. The precise nature of the effect will depend on the interaction between the degree of impact (e.g. extent, duration, magnitude, permanence etc.) and the importance or value of the receptor in each case. For example, the characterisation of ecological receptors would consider integrity (coherence of the ecological structure and function), and conservation status (ability of the receptor to maintain its distribution and/or extent/size) of the receptor.

4.5.4 A key consideration in assessing the effects of any development on flora and fauna is to define the areas of habitat and the species that need to be considered. This required the identification of a potential Zone of Influence, which is defined as those areas and resources that may be affected by biophysical changes caused by project activities, however remote from the respective survey area.

4.5.5 An assessment of the effect(s) on a particular receptor, as a result of construction or operational activities, were made by suitably qualified and experienced practitioner(s). Where possible, quantitative analyses were undertaken to support the impact assessments. Where the subject did not lend itself to quantitative analysis, qualitative analysis based on the relevant literature and similar studies were utilised to provide a robust assessment. This was determined for each environmental topic, depending on the nature of the receptor.

4.5.6 Each potential impact was assessed in terms of receptor importance or value (e.g. nature conservation value, landscape value or amenity value), followed by an assessment of the magnitude of the impact. Based on a combination of these criteria, a determination of whether or not significant effects could result was made. For any potentially significant effect identified, appropriate mitigation measures were prescribed. The residual effects were then determined for each significant effect; taking into account all proposed mitigation.

4.5.7 Table 4-2 details the value of each receptor and the criteria for assessing it.

Table 4-2 Nature conservation receptor evaluation criteria.

Value	Criteria
International	• An internationally important site (UK Marine SAC Project) or a site proposed for, or considered worthy of designation; • A regularly occurring substantial population of internationally important species (e.. EPS listed on Annex IV of the Habitats Directive).

Value	Criteria
National	• A nationally designated site, or a site proposed for, or considered worthy of such designation; • A viable area of habitat type listed in Annex I of the Habitats Directive or of smaller areas of such habitat which are essential to maintain the viability of a larger whole; or • A regularly occurring substantial population of a nationally important species, e.g. listed on Schedule 5 & 8 of the WCA 1981 (as amended).
Regional	• Areas of internationally or nationally important habitats which are degraded but are considered readily restored; • Viable habitats or populations of a species identified as a PMF, or smaller areas/populations which are essential to maintain the viability of a larger area/population as a whole; • Regionally important population/assemblage of an EPS, Schedule 1 and/or 5 species. • Regionally important assemblages of other species or habitats.
High Local	• Locally important population/assemblage of an EPS, Schedule 1 and/or 5 species; or • Sites containing viable breeding populations of species known to be county rarities or supplying critical elements of their habitat requirements.
Moderate Local	• Undesignated sites, features or species considered to appreciably enrich the habitat resource within the local context (within 2 km radius from the site) and may benefit from mitigation as a good practice measure.
Low Local	• Undesignated sites, features or species considered to appreciably enrich the habitat resource within the immediate environs of the site and may benefit from mitigation as a good practice measure.
Negligible	• Common and widespread or modified habitats or species.
Negative	• Invasive, alien species often scheduled under Section 14, Schedule 9 of the WCA 1981 (as amended).

Nature of Impact

4.5.8 In considering the impact severity, a range of factors are taken into account as applicable to the subject matter. The factors utilised are based on the Institute of Ecology and Environmental Monitoring guidelines of ecological assessment (CIEEM, 2018) but are applicable to most topic areas. They include the:

- Direction of impact - Positive (beneficial) or Negative (adverse);
- Extent: spatial or geographical area affected;
- Magnitude (Scale): size, amount, intensity, volume;
- Duration: short, medium, long-term and permanent or temporary;
- Frequency and timing: how often and when (time of day or seasonality);
- Reversibility: can the effect be reversed or is it irreversible; and
- Cumulative nature with other activities, outwith the Project.

4.5.9 These factors are taken into consideration in the context of the sensitivity of the receptor and the range of potential effects.

4.5.10 The duration of the impact is also noted, as permanent or temporary. Temporary impacts can be further sub-divided, if necessary, in accordance with the following definitions, although use of this terminology is highly dependent on other factors within the environmental topic being assessed (e.g. lifecycle of flora and fauna species):

- Short-term: less than 1 year in duration;
- Medium-term: between one to three years in duration; and
- Long-term: more than three years in duration.

Magnitude of Impact

4.5.11 Table 4-3 provides an overview of the range of impact magnitudes referred to within this assessment. In addition, impacts may also be positive in nature.

Table 4-3 Definition of the magnitude of impact for ecological assessments.

Magnitude	Description
Negligible/None	Very slight change from the baseline conditions. Changes barely detectable, approximating to the 'no change' situation. Any effects likely to be reversible within 12 months and not affect the conservation status or integrity of the receptor.
Low	Minor shift away from baseline conditions. Effects will be detectable but unlikely to be of a scale or duration to have a significant effect on the conservation status or integrity of the receptor in the short term (1-5 years). Overall baseline character of site will not alter substantially.
Medium	Clear effect on the conservation status or integrity of the receptor in the short to medium term (6-15 years), although this is likely to be reversible or replaceable in the long-term (15 years plus).
High	Total loss of, or major alteration to conservation status or integrity of a receptor with situation likely to be irreversible, even in the long term. Fundamental alteration to the character and composition of the Site.

Indirect and Cumulative Impacts

4.5.12 As well as direct impacts (resulting from the project itself), impacts can also be indirect or cumulative. Where this terminology is used within any assessment, the definitions for these are outlined below (as taken from 'Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions' (European Commission, 1999)):

- Indirect: impacts on the environment, which are not a direct result of the project, often produced away from or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts; and
- Cumulative: impacts that result from incremental changes caused by other past, present or reasonably foreseeable future actions together with the project.

4.5.13 A review of planned developments was undertaken to identify planned developments within the timescales relevant to the Project. There are no anticipated permitted developments within the proposed works area that could generate cumulative effects.

4.5.14 ort Henry and Bay Marina capital dredging might coincide with Smith Quay works. The short duration of the dredging operations and the relatively small dredge volumes (approx. 8,500 m^3 at Marina and 500 m^3 at Port Henry) significantly limit the scale of potential cumulative effects on water quality and benthic habitats. When combined with Smith Quay dredging, the residual cumulative effect is assessed as minor and not significant, and scoped out from further assessment. Accordingly all cumulative effects have been scoped out of the assessment.

Determination of Significant Effects

4.5.15 The significance of an effect is a product of the importance or value of the ecological receptor and the magnitude of the impact on it, moderated by professional judgment.

4.5.16 Importance values were assigned to individual receptors, using a set of criteria and terminology appropriate for each environmental topic and defined within each section. Typically, receptor importance or value will be classed as negligible, low, medium, or high.

4.5.17 Table 4-4 illustrates a matrix-based system for the significance of impact, which is used to guide the assessment of significance. In terms of the EIA Regulations, only effects which are 'moderate' or 'major' are considered significant, the others constituting a non-significant effect. The level of effect has been assessed as either major, moderate, minor or negligible.

Table 4-4 Categorising significance of effects.

Magnitude of Impact	Importance/Value of Receptor				
	Low Local/Negligible	Moderate/High Local	Regional	National	International
Negligible	Negligible	Negligible	Negligible	Negligible	Minor
Minor/Low/Small	Negligible	Minor	Minor	Minor	Moderate
Moderate/Medium	Minor	Minor	Moderate	Moderate	Major
Major/High/Large	Minor	Moderate	Moderate	Major	Major

4.5.18 The categories provide a threshold to determine whether or not significant effects may result from the proposed development. A typical categorisation is shown in Table 4-5. Effects can be both beneficial or adverse.

Table 4-5 Categorisation and definition of effects.

Category	Definition
Negligible	No detectable change to the environment resulting in no significant effect.
Minor	A detectable, but non-material change to the environment resulting in no significant effect.
Moderate	A material, but non-fundamental change to the environment, resulting in a possible significant effect.
Major	A fundamental change to the environment, resulting in a significant effect

Approach to Mitigation

4.5.19 The Institute of Environmental Monitoring and Assessment (IEMA) define three categories of mitigation in their EIA guidance for Shaping Quality Development (IEMA, 2015). These categories are used throughout this EA and are outlined below:

- Primary (Inherent) Mitigation: Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.
  E.g. Identifying a key habitat or archaeological feature that should remain unaffected by the development's layout and operation.
- Secondary (Foreseeable) Mitigation: Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the EA.
  E.g. Adoption of a Marine Mammal Protection Plan to limit the effects of disturbance through piling noise.
- Tertiary (Inexorable) Mitigation: Actions that would occur with or without input from the EA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.
  E.g. Considerate contractors' practices that manage activities which have potential nuisance effects.

4.5.20 As per the above IEMA categories, all the primary and tertiary mitigation embedded in the design and proposed construction techniques are set out in the Project Description (Section 2), with topic specific elements discussed in the individual topic chapters. The primary and tertiary mitigation measures will be used when assessing the significance of effects, since both these forms of mitigation are certain to be delivered. Thus, any effects that might arise without the primary and tertiary mitigation, do not need to be identified as potential effects, as there is no potential for them to arise.

4.5.21 Secondary mitigation measures will be proposed where practicable for any potential significant adverse effects that are identified. Mitigation measures will then be developed, as

required, taking into account current guidance, precedents from similar projects, effectiveness and feasibility of solutions, and incremental costs.

4.5.22 It may only be possible to reduce the severity of potential adverse effects through secondary mitigation, as some cannot be eliminated entirely. Residual effects are those that remain after mitigation has taken place, these are assessed in the same way as detailed in the Assessment Methodology Section.

4.5.23 A Schedule of Mitigation and Construction Environmental Management Plan (CEMP) will be produced to outline best practices during construction.

5. Biodiversity

5.1. Introduction

5.1.1 This section lays out the impact assessment relevant to the ecological receptors marine mammals and diadromous fish, benthic ecology, and marine ornithology.

5.2. Marine Mammals and Fish

Introduction

5.2.1 Impacts on marine mammals are identified and subject to detailed impact assessment, with mitigation proposed, potential cumulative impacts and lastly residual impacts following assessment of their significance.

5.2.2 The following pressures have been scoped in for marine mammals and are detailed in the following subsection:

- Collision;
- Underwater noise from construction activities; and
- Underwater noise from vessel traffic.

5.2.3 The following pressures have been scoped in for fish and are detailed in the following subsection:

- Underwater noise from construction activities; and
- Release of suspended sediments.

Regulations, Guidance and Sources of Information

5.2.4 As outlined in Sections 3: Statutory Context and Policy there is national and international legislation used to identify sensitive marine mammal and fish species. These laws ensure greater consideration of such species on a site where their presence is more likely, and that greater consideration is given during assessments.

Assessment Methodology

Baseline Methodology

5.2.5 A desk study was conducted to inform the characterisation of the existing baseline conditions; the following sources were consulted to identify and assess which marine mammals and fish may be using the Peterhead Bay and surrounding waters and for what

purposes. Information on population sizes, seasonal trends, foraging characteristics and associated designated sites was also sought:

- The UK PMF list (NatureScot, 2025a).
- Interactive National Marine Plan (Marine Scotland, 2025)
- Management abundance estimates for cetacean management Units in UK waters (IAMMWG, 2022).
- Scientific Advice on Matters Related to the Management of Seal Populations (SCOS, 2022).
- Atlas of Cetacean Distribution in North-West European Waters (Reid et al. , 2003).
- Various scientific reports and journal articles regarding marine mammal distribution and movements in the northeast Atlantic region.

Determining Impact significance

5.2.6 Determining the significance of marine mammal and fish impacts will follow the methodology set out in Section 4: Methodology.

5.2.7 All marine mammals in the scope of this assessment are protected and considered as highly valuable receptors. Protected species of fish would be likewise considered as high value receptors and species without legal protections would be considered as low value receptors in this assessment.

Baseline

Cetaceans

5.2.8 The most common species in Scottish waters are harbour porpoise, bottlenose dolphin, white-beaked dolphin (*Lagenorhynchus albirostris*), common dolphin (*Delphinus delphis*), Risso's dolphin (*Grampus griseus*), minke whale (*Balaenoptera acutorostrata*), and killer whale (*Orcinus orca*).

5.2.9 Peterhead Harbour falls within Block NS-D of the most recent SCANS surveys (SCANS-IV; Gilles *et al.*, 2023). Abundances and densities of species monitored and those sighted as part of the SCANS-IV survey within survey Block NS-D are presented in Table 5-1. Abundances for cetacean Management Units (MUs) that overlap the study area are also included (IAMMWG, 2023). MU abundances provide a reference for population-level impact assessments of proposed plans (and cumulative impacts with other projects).

5.2.10 This assessment groups cetacean species into their hearing groups: low frequency (LF). High frequency (HF), and very high frequency (VHF). These three groups are the receptor groups and therefore assessed against the pressures detailed above. All cetaceans are protected both within the UK and internationally and are therefore classified as being of international importance.

Table 5-1 Cetacean distribution from SCANS-IV (Gilles et al., 2023) and IAMMWG, 2023.

Species	Abundance in SCANS VI Block NS-D	Density (animals) in SCANS VI Block NS-D	Abundance by UK portion of Management Unit (MU)** (IAMMWG, 2023)	Hearing Group
Harbour Porpoise *Phocoena phocoena*	38,577	0.5985	159,632 (NS)	VHF
Bottlenose Dolphin* *Tursiops truncatus*	None recorded	None recorded	224 (CES) 1,885 (GNS)	HF
White-beaked Dolphin *Lagenorhynchus albirostris*	5,149	0.0799	34,025 (CGNS)	HF
White-sided Dolphin *Lagenorhynchus acutus*	None recorded	None recorded	12,293 (CGNS)	HF
Minke Whale *Balaenoptera acutorostrata*	2,702	0.0419	10,288 (CGNS)	LF
Common Dolphin *Delphinus delphis*	None recorded	None recorded	57,417 (CGNS)	HF
Risso's Dolphin *Grampus griseus*	None recorded	None recorded	8,687 (CGNS)	HF
Fin Whale *Balaenoptera physalus*	57	0.0009	No recorded MU	LF

*Known population of bottlenose dolphin in Moray Firth and semi-resident population in Aberdeen Harbour that are not reflected in SCANS-IV survey.

**NS = North Sea; CES = Coastal East Scotland; GNS = Greater North Sea; CGNS = Celtic & Greater North Sea

Pinnipeds

5.2.11 The closest seal haul-out site to Peterhead Port is the Ythan River Mouth seal haul-out site located approximately 25 km south of the Project and is designated for grey seal year-round. Grey seal have been sighted regularly within Peterhead Port.

5.2.12 Pinnipeds are protected in the UK under the WCA 1981 and the Marine (Scotland) Act 2010. For this assessment, all pinniped species are grouped into one receptor group and classed as of national importance.

Fish

5.2.13 The area surrounding Peterhead is known to be a nursery ground for several species of fish such as sandeel, whiting, saithe and sprat (Coull et al 1998). The area adjacent to Peterhead Port is also a nursing ground for lemon sole and just north of Peterhead, hugging the coastline, is known as a plaice nursey.

5.2.14 The River Dee SAC is located approximately 43 km south of the Project area. The site is designated for Atlantic salmon (*Salmo salar*), which are a protected species in UK waters under Schedule 3 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Given that salmon are a migratory species, there is potential for their presence along the coast towards Peterhead. However, it is unlikely they would enter the port in large numbers, given its enclosed nature and lack of a freshwater river.

5.2.15 There is limited information on fish present within the harbour area but it is assumed that species present in the wider area could potentially occur, alongside species commonly present in harbours and coastal waters of the region such as mullet and mackerel.

5.2.16 For this assessment, fish have been grouped together and will be assessed as one receptor group. The status of Atlantic salmon as an internationally important species will be used to indicated the importance of the group for this assessment.

Environment

5.2.17 No baseline noise data has been collected during this assessment and no published data is available for the existing underwater noise levels within the Project construction area. Geotechnical information previously collected around Smith Quay was used to inform the physical characteristics of the model i.e. to accurately model noise propagation through sediment.

5.2.18 The underwater noise technical report utilised existing noise data on the construction equipment that will be used during construction. If this information was not available, the best available information to inform the model was used.

5.2.19 The underwater noise modelling included in Annex 1 Noise Modelling Report considered the most significant sources of noise from construction activities:

- Piling;
- Dredging;
- Rock breaking; and

- Cardox rock breaking (no use of explosives).

Impact Assessment

5.2.20 Marine mammals are potentially sensitive to a range of pressures detailed in Table 4-1. Marine mammals are highly sensitive to noise which can result in auditory injury, temporary threshold shifts in hearing, masking of vocalisations, temporary displacement or physical injury if exposed to sufficiently high sound pressure levels (SPLs).

5.2.21 An assessment of the possible risks from the Proposed Works including identification of injury or disturbance pathways for marine mammals and fish, will help to ensure safe operations with a favourable conservation outcome. The primary potential impact pathways that have been identified in relation to the proposed works are:

- Collision with vessels;
- Release of contaminants from sediment;
- Underwater sound impacts from construction activities; and
- Underwater sound impacts from increased vessel traffic.

Collision with vessels

5.2.22 Collisions with construction or support vessels ('ship strikes') have the potential to injure or kill marine animals. Cetaceans are at particular risk when their core habitats overlap with areas of dense, fast-transiting vessel traffic. Large, slow-moving cetaceans are particularly at risk.

5.2.23 The severity and frequency of collisions is species specific and can be divided into effects to larger, less agile species e.g. minke whale and smaller, faster species, e.g. harbour porpoise. The risk also varies with the size, speed, and time needed to change course of the vessels.

5.2.24 Collision with marine vessels can result in injury or even death. Vessels that are > 80 m in length or travelling >14 kt are the most likely to cause severe or lethal injuries (Laist *et al.*, 2001). Where speeds are reduced to <10 kt, the probability of lethal injury from collision may be lowered to below 50% (Vanderlaan and Taggart, 2007). The coastal waters off Aberdeenshire are exposed to high vessel traffic, and it is likely that marine mammals present will be accustomed to the presence and movements of vessels in the area.

5.2.25 Marine mammals can detect and avoid vessels, however collisions may still occur while animals are engaged in other activities such as foraging, breathing, interacting, or as a result of their inquisitive nature (Wilson *et al.*, 2007). Harbour porpoise are the most abundant cetacean species within the area (Table 2) and have been shown to exhibit an avoidance response to vessel sound (Benhemma-Le Gall *et al.*, 2023).

5.2.26 The proposed construction works may increase the number of vessels in the immediate area; however Peterhead Bay is semi-enclosed with breakwaters limiting vessel speeds. Within Peterhead Port, Byelaw 9 directs that the speed limit for vessels in the bay is 5 kt over the ground, with the exception of some recreational vessels, or where it is not safe for the vessel

to travel at low speeds. The maximum speed for vessels within the Peterhead Bay Marina is 4 kt above ground (PPA, 2020).

5.2.27 It is highly unlikely that minke whale will venture into the harbour area, whereas bottlenose dolphin and harbour porpoise may occasionally venture into port areas breakwaters but there is no evidence of this occurring regularly at Peterhead and given their agility and ability to flee slow moving vessels, it is unlikely they will collide with such vessels.

5.2.28 Seals are also at risk of vessel collision. The nearest known haul-out site is 23 km south in the Ythan Estuary, with no known pupping sites in the region (Marine Scotland, n.d.). There is a known presence of grey seals in Peterhead Harbour and no known issue with collisions and given the slow moving nature of vessels in the harbour, and the fact that seals are accustomed to vessels, it is considered very unlikely that seals will collide with vessels used for the works.

5.2.29 Table 5-2 summarises the likelihood and significance of impact for each species assessed. Overall, the effects are expected to be of Negligible magnitude to all marine mammals. The receptor value is International for cetaceans and national for pinnipeds. The impacts to cetaceans and pinnipeds due to collision with vessels are therefore considered to be of **Minor** and **Negligible** significance, respectively.

Table 5-2 Magnitude and significance of impact from vessel collision on each receptor group.

Hearing group	Magnitude of impact	Significance of impact
LF cetaceans	Negligible	Minor
HF cetaceans	Negligible	Minor
VHF cetaceans	Negligible	Minor
Phocid Pinnipeds	Negligible	Negligible

Release of Contaminants from Sediment

5.2.30 There is a low chance of marine mammals and fish inhabiting the Project area during the construction activities given the small scale of the Project and its location within a highly active port area. The release of contaminants is expected to be localised and of a short duration. Sediment sample testing undertaken as part of the dredging application revealed limited exceedance of Action Level 1 contaminant levels in one grab sample (NIRAS, 2025d), indicating localised contamination of copper and hydrocarbons (polycyclic aromatic hydrocarbons (PAHs) and total hydrocarbons). The levels detected are not unusual in a harbour environment where fuel and lubricant oils are routinely used. These contaminants are present in superficial (i.e. surface) fine sediments which will be naturally mobile under certain conditions such as storms. There is no indication of contamination in deeper sediments.

5.2.31 Therefore the effects are expected to be of Negligible magnitude for all species of marine mammals and fish. Receptor value for cetaceans and fish is International, and for national for

pinnipeds. Therefore the impacts to cetaceans and fish due to toxic contamination are therefore considered to be of **Minor** significance, as summarised in Table 5-3. For pinnipeds the impact significance is considered to be **Negligible**.

Table 5-3 Magnitude and significance of impact from toxic contamination on each receptor group.

Hearing group	Magnitude of impact	Significance of impact
LF cetaceans	Negligible	Minor
HF cetaceans	Negligible	Minor
VHF cetaceans	Negligible	Minor
Phocid Pinnipeds	Negligible	Negligible
Fish	Negligible	Minor

Underwater Noise Impacts from Construction Activities

5.2.32 The risk of underwater noise generated from construction activities has the greatest potential to cause impact to cetaceans of the three potential pathways as there is potential to cause TTS or Auditory Injury (AUD INJ). AUD INJ replaced Permanent Threshold Shift in the most recent National Marine Fisheries Service (NMFS) guidelines (NMFS, 2024a).

5.2.33 Marine Mammals are known to be sensitive to underwater noise generated by construction activities. The level of sensitivity is species specific, which has be divided into phocid pinnipeds (PW), LF, HF, and VHF cetaceans (Table 5-1). Cetaceans rely on vocalisations and hearing to communicate, navigate, and forage for prey.

5.2.34 Fish species are sensitive to underwater noise. In this assessment, the focus is on fish species with swim bladders such as Atlantic salmon (*Salmo Salar)* since they are relatively more sensitive to underwater noise than species which lack a swim bladder and therefore represent a worst-case scenario in the context of species potentially occurring.

5.2.35 Table 5-4 details the hearing groups and relevant species assessed in this section.

Table 5-4 Functional hearing groups present near Peterhead Harbour which are being assessed.

Hearing Group	Example Species	Underwater Auditory Range
Very High Frequency (VHF) cetaceans	Harbour Porpoise	275 Hz – 160 kHz
High Frequency (HF) cetaceans	Bottlenose Dolphin	150 Hz – 160 kHz

Hearing Group	Example Species	Underwater Auditory Range
Low Frequency (LF) cetaceans	Minke Whale	7 Hz – 35 kHz
Phocid Pinnipeds (PW)	Grey seal	40 Hz – 90 kHz

5.2.36 Underwater noise modelling was undertaken to inform this assessment, which focused on hearing impairment effects (TTS and AUD INJ) due to impulsive noise, based on NMFS (2024a) criteria. In the case of behavioural reaction, NMFS criteria were applied for the LF and HF cetacean groups. For the harbour porpoise, behavioural response threshold was based on the VHF criterion indicated in (Tougaard, 2021). For the harbour porpoise, the criterion for adverse behavioural reaction (fleeing) was chosen from the Southall *et al*. 2007 study. Grey seal audial injury and TTS thresholds were based on (NMFS, 2024). A generalised avoidance threshold for grey seal is not available due to insufficient data (Tougaard, 2021). Sound Exposure Levels (SEL) are used to quantify the threshold for each hearing group, the SEL has been weighted to match their auditory range where possible. Table 5-5 details the threshold for impulsive noise exposure for each hearing group assessed and Table 5-6 details the threshold for non-impulsive noise exposure for each hearing group.

Table 5-5 Impulsive noise exposure criteria for cetacean function hearing groups.

Hearing Group	Effect	Sound Type	SEL (dB re 1 μPa^2s)	SPL_{peak}/SPL_{125ms} /RMS (dB re 1 μPa^2s)
Very High Frequency (VHF) cetaceans*	AUD INJ	Cumulative	159 (VHF-weighted SEL)	202 SPL_{peak}
	TTS	Cumulative	144 (VHF-weighted SEL)	196 SPL_{peak}
	Behavioural**	Single Strike	-	103 VHF-weighted SPL_{125ms}
High Frequency (HF) cetaceans*	AUD INJ	Cumulative	193 (HF-weighted SEL)	230 SPL_{peak}
	TTS	Cumulative	178 (HF-weighted SEL)	224 SPL_{peak}
	Behavioural	RMS	-	160 (RMS)
Low Frequency (LF) cetaceans*	AUD INJ	Cumulative	183 (LF-weighted SEL)	222 SPL_{peak}

Hearing Group	Effect	Sound Type	SEL (dB re 1 μPa^2s)	SPL_{peak}/SPL_{125ms} /RMS (dB re 1 μPa^2s)
	TTS	Cumulative	168 (LF-weighted SEL)	216 SPL_{peak}
	Behavioural	RMS	-	160 (RMS)
Phocid Pinni-peds (PW)*	AUD INJ	Cumulative	183 (unweighted SEL)	230 dB peak (unweighted SEL)
	TTS	Cumulative	170 (unweighted SEL)	212 dB peak (unweighted SEL)
Fish with swim bladder	Recoverable in-jury***	Cumulative	203 (unweighted SEL)	-
	TTS***	Cumulative	186 (unweighted SEL)	-
	Behavioural****	Single strike	135 (unweighted SEL)	-

*NMFS 2024a **Tougaard 2021 ***Popper *et al.* 2014 ****Hawkins *et al.* 2014

Table 5-6 Non-impulsive (continuous) noise exposure criteria for cetacean function hearing groups.

Hearing Group	Effect	Threshold Level
Very High Fre-quency (VHF) ceta-ceans*	AUD INJ	181 dB re 1 μPa^2s (weighted SEL) -24 h
	TTS	161 dB re 1 μPa^2s (weighted SEL) -24 h
	Adverse behavioural (flee-ing)**	140 dB re 1 µPa (RMS)
High Frequency (HF) cetaceans*	AUD INJ	201 dB re 1 μPa^2s (weighted SEL) -24 h
	TTS	181 dB re 1 μPa^2s (weighted SEL) -24 h
	Behavioural	120 dB re 1 µPa (RMS)
Low Frequency (LF)	AUD INJ	197 dB re 1 μPa^2s (weighted SEL) -24

Hearing Group	Effect	Threshold Level
cetaceans*		h
	TTS	177 dB re 1 µPa^{2}s (weighted SEL) -24 h
	Behavioural	120 dB re 1 µPa (RMS)
Phocid Pinnipeds (PW)*	AUD INJ	195 – 218 dB (unweighted SEL)
	TTS	181 dB (unweighted SEL)
Fish with swim bladder	TTS	158 dB re 1 µPa (RMS) – 12 hr
	Recoverable injury	170 dB re 1 µPa (RMS) – 48 hr

*NMFS 2024a **Southall *et al.* 2007 *** Popper *et al.* 2014

5.2.37 The calculation of biological effects was performed using the framework presented by Thomsen *et al*. 2021. There are several overlapping zones of noise effects which depend on the relative distance of the animal to the location of the sound source (Figure 5.1). The underwater noise technical report focused on behavioural response and hearing impairment such as TTS, AUD INJ and recoverable injury in fish with a swim bladder, since these are the effects that need to be considered due to existing regulations. Impacts in the form of TTS, AUD INJ, recoverable injury, and behavioural change are considered in the applied guidelines for the analysis of noise impacts on marine organisms.

5.2.38 The most relevant parameters of the impact analysis are those related to TTS, AUD INJ, and recoverable injury. This is because underwater noise generated from the construction activities should cause no hearing damage to marine organisms. Hence, environmental decisions are influenced by the results related to hearing damage. Behavioural changes, however, are also a very important element related to noise impacts, as they can be related to effects on organisms at the population level. Therefore, their importance has also been noted.

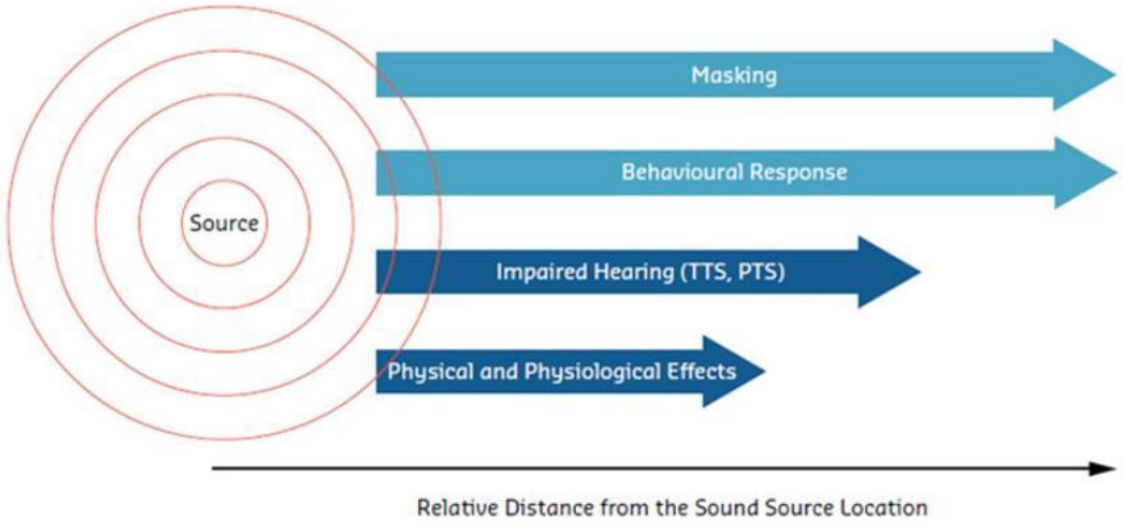

Figure 5.1 Potential effects of noise at different distance from a sound source (from Thomsen et al 2021).

Piling

5.2.39 Piles will require a combination of rock drilling and driving to achieve the required depth and capacity. The expected method of piling is termed ODEX piling. The term "ODEX" stands for Overburden Drilling EXcentric, referring to the technique's ability to drill through overburden (loose soil, gravel, or weathered rock) before reaching solid bedrock. ODEX piling is a percussive drilling technology where the excentric drill bit swings out creating a hole with a diameter greater than that of the steel casing. This allows the steel casing to traverse down behind the drill bit without having to first remove the drill bit in order to insert the casing. The hammer is driven by air. The percussion rate by the hammer is 1235 blows per minute at a pressure of 17 bar. This high rate of percussion means that the noise produced by the source is continuous rather than impulsive and therefore similar to vibratory piling. Table 5-7 details the specifications for piling used in the modelling.

5.2.40 The modelled noise levels are much higher than those which will result from ODEX piling. This is a percussive technique, but the high rate of percussion means that the noise generated is defined as non-impulsive, continuous sound. The hammer is driven by air pressure at around 17 bar, meaning that relatively low energy levels are used in the piling. There is limited empirical evidence for associated underwater noise levels but estimates are of the order of 188 dB re μPa^2s SEL_{peak} (Amey, 2017) and very much lower than the noise levels modelled here. Only a short period of impact piling, after completion of percussive drilling, will be required to set each pile; therefore, the predicted impact ranges presented below are highly conservative, especially compared to the assumed 3,000 strikes for noise modelling.

Table 5-7 Piling parameters and resulting broadband source levels.

Parameter	Value
Pile diameter	1.067 m
Water depth	~10 m

Parameter	Value
Pile driver energy	200 kJ
Ram mass	14,000 kg
No. of strikes to drive a single pile	3,000
SEL	206.8 dB re µPa^{2}s
SEL_{cum}	241.6 dB re µPa^{2}s
SEL_{peak}	231.8 dB re µPa^{2}s
SEL_{rms}	215.8 dB re µPa^{2}s

5.2.41 The results of noise modelling indicate that pile driving is expected to produce the highest level of impact. VHF cetaceans are expected to have the greatest impact for behavioural effect of all groups for both maximum impact range (4.54 km) and impact area (10.02 km^2).

5.2.42 Fish having a swim bladder are expected to show behavioural reaction to the pile driving noise at a maximum distance of approximately 2.8 km from the sound source, within the area of 4.6 km^2. Recoverable injury and temporary threshold shift are expected to be mostly contained to the harbour basin area.

5.2.43 Table 5-8 details the considerations in distance for piling for each hearing group.

Table 5-8 Considerations for pile driving for each hearing group.

NOAA Hearing Group	AUD INJ	TTS	Behavioural changes
Low frequency (LF)	Within harbour area	Potential for outside harbour area up to 3.24 km away	Within harbour area
High frequency (HF)	Within harbour area	Within harbour area	Within harbour area
Very high frequency (VHF)	Within harbour area	Within harbour area	Potential for outside harbour area up to 4.54 km away
NOAA Hearing Group	**Recoverable Injury**	**TTS**	**Behavioural changes**
Fish with swim bladder	Within harbour area	Within harbour area	Potential for outside harbour area up to 2.82 km away

5.2.44 In line with the JNCC guidance for piling (Joint Nature Conservation Committee, 2010), a marine mammal observer (MMO) will ensure that an area of 500 m from the noise source is clear of marine mammals, prior to works commencing (see further detail on marine mammal observer mitigation below).

Dredging

5.2.45 Dredging operations will be carried out using a backhoe dredge. This kind of operation results in continuous noise from several sources, the loudest of which is the bottom impact sound from the bucket with a reported source level of 179.4 dB re 1 µPa SPL (Reine *et al.* 2012).

5.2.46 Noise modelling was undertaken to simulate the expected noise generated from dredging during the construction works (Annex 1 Noise Modelling Report). The results of this modelling indicate that LF cetaceans would be most impacted by underwater noise generated from dredging. LF cetaceans have an impact range of 0.24 m for AUD INJ, however, Peterhead Harbour is semi-enclosed and the distance from the construction works is greater than 0.24 km, indicating that unless the cetacean is within the harbour there would not be an impact.

5.2.47 For VHF cetaceans the ranges for impact are also very low with an impact range for behavioural impacts of 0.68 m, indicating that an animal would need to be within the harbour and remain as such for the duration of the works. Given cetaceans are prone to fleeing construction activities and human-caused noise, it is unlikely that individuals would remain in the harbour for the duration of works.

5.2.48 The modelling results of dredging sound indicate that recoverable injury can be expected to occur in fish with a swim bladder at a small range of 20 m. In case of the temporary threshold shift, the impact area is slightly larger than for the recoverable injury and can reach up to 40 m.

5.2.49 Table 5-9 details the considerations in distance for dredging for each hearing group.

Table 5-9 Considerations for dredging for each hearing group.

NOAA Hearing Group	AUD INJ	TTS	Behavioural changes
Low frequency (LF)	Within 250 m of source	Within harbour area	Within harbour area
High frequency (HF)	Within 20 m of source	Within 60 m of source	Within harbour area
Very high frequency (VHF)	Within 40 m of source	Within 500 m of source	Within harbour area
NOAA Hearing Group	**Recoverable Injury**	**TTS**	**Behavioural changes**
Fish with swim bladder	Within 20 m of source	Within 40 m of source	-

Rock Breaking

5.2.50 A range of different equipment is projected to be used during the construction work, including:

- Ripper;
- Diesel driven hydraulic power unit;
- Rock wheel;
- Rock breaker (e.g. RAMMER 9033E).

5.2.51 In the case of the ripper, hydraulic power unit, and rock wheel the noise generated by them is either similar to dredging noise (ripper and rock wheel), or generally above water noise (hydraulic power unit) i.e. airborne.

5.2.52 The rock breaker RAMMER 9033E is a hydraulic hammer with a minimum weight of 7,400 kg, an input power of 138 kW and an impact rate of up to 645 beats per minute. It may operate completely submerged directly on the substrate. It may potentially emit considerable noise from its casing or via the substrate it is acting on, however, no measurements for underwater deployment are available. The underwater noise technical report used the down-the-hole (DTH) pile drilling as a proxy, resulting in the source levels detailed in Table 5-10.

Table 5-10 Rock breaking parameters and resulting broadband source levels.

Parameter	Value
Assumed operational time per day	24 hr
Impact rate	645 bpm
SEL	173.7 dB re µPa^{2}s
SEL_{cum}	233.4 dB re µPa^{2}s
SEL_{peak}	193.7 dB re µPa^{2}s
SEL_{rms}	185.7 dB re µPa^{2}s

5.2.53 Rock breaking is expected to have the highest impact on LF cetaceans, with TTS impact ranges reaching up to 1.6 km from source. The effects of rock breaking sound emission for fish are likely to occur at small ranges of 640 m, 200 m and 1.16 km for behavioural response, recoverable injury, and temporary threshold shift, respectively.

5.2.54 Table 5-11 details the considerations in distance for rock breaking for each hearing group.

Table 5-11 Considerations for rock breaking for each hearing group.

NOAA Hearing Group	AUD INJ	TTS	Behavioural changes
Low frequency (LF)	Within harbour area	Within harbour area	Within 80 m of source

High frequency (HF)	Within 40 m of source	Within 100 m of source	Within 80 m of source
Very high frequency (VHF)	Within 20 m of source	Within 100 m of source	Within harbour area
NOAA Hearing Group	**Recoverable Injury**	**TTS**	**Behavioural changes**
Fish with swim bladder	Within 200 m of source	Within harbour area	Within harbour area

Rock breaking (Cardox use)

5.2.55 Instead of conventional explosives, a so-called Cardox system is used. It is designed to fracture materials by rapid discharging of carbon dioxide at high pressures into the material.

5.2.56 As there are no separate thresholds for the type of blasting considered in the scope of the project, criteria described for the explosive sounds normally applied in case of blasting have been applied. Explosive sounds form a separate category of impulsive noise, characterised by a near-instantaneous pressure rise time and a very high peak pressure level, followed by a rapid pressure decay creating a shock wave (Dall'Osto *et al.* 2023). Due to such properties, emissions of explosive sounds can lead to severe effects on marine animals. Threshold values applied for explosive sounds are included in U.S. National Marine Fisheries Service guidelines (NMFS, 2024b).

5.2.57 Based on this, the underwater noise technical report concluded that a single Cardox blast releases the equivalent energy of approximately 0.030 kg TNT, which was used to define the source level.

5.2.58 The following parameters have been considered for the derivation of the source levels:

1. A TNT equivalent of 0.030 kg is assumed within every individual borehole. There is a time delay of 25 milliseconds between the blasting of the different boreholes.
2. A total number of 20 boreholes is assumed for the evaluation of the SEL results.

5.2.59 The respective source levels are:

- SEL = 201.1 dB re 1 µPa2s;
- Peak Sound Pressure Level (SPLpeak) = 254.7 dB re 1 µPa.

5.2.60 The modelling results indicate that LF and VHF cetaceans are expected to have the largest behavioural response from blasting of up to 1.16 km from source. For fish with a swim

bladder physical injury risk is predicted to 120 m for all fish based on peak sound pressure level. Mortality can be expected within a range of 20 m.

5.2.61 All impacts are expected to remain within the harbour area for cetaceans and fish.

5.2.62 Table 5-12 details the considerations in distance for blasting for each hearing group.

Table 5-12 Considerations for rock breaking for each hearing group.

NOAA Hearing Group	AUD INJ	TTS	Behavioural changes
Low frequency (LF)	Within 160 m of source	Within harbour area	Within harbour area
High frequency (HF)	Within 20 m of source	Within 80 m of source	Within 160 m of source
Very high frequency (VHF)	Within 80 m of source	Within 1 km of source	Within harbour area
NOAA Hearing Group	**Physical Injury > 2g**	**Physical Injury < 2g**	**Mortal Injury**
Fish with swim bladder	Within 100 m of source	Within 180 m of source	Within 20 m of source

Summary

All cetacean species and fish species are considered of international importance in this assessment. The magnitude of impact for each receptor group is detailed in Table 5-13. From this the significance of impact is determined based on the importance of the receptor.

Table 5-13 Magnitude and significance of impact from each construction activity on each receptor group.

Hearing group	Activity	Magnitude of impact	Significance of impact
LF cetaceans	Dredging	Negligible	Minor
	Piling	Negligible	Minor
	Rock breaking	Negligible	Minor
	Blasting	Negligible	Minor
HF cetaceans	Dredging	Negligible	Minor
	Piling	Negligible	Minor
	Rock breaking	Negligible	Minor

Hearing group	Activity	Magnitude of impact	Significance of impact
	Blasting	Negligible	Minor
VHF cetaceans	Dredging	Negligible	Minor
	Piling	Negligible	Minor
	Rock breaking	Negligible	Minor
	Blasting	Negligible	Minor
Phocid pinnipeds	Dredging	Negligible	Negligible
	Piling	Negligible	Negligible
	Rock breaking	Negligible	Negligible
	Blasting	Negligible	Negligible
Fish with swim bladder	Dredging	Negligible	Minor
	Piling	Negligible	Minor
	Rock breaking	Negligible	Minor
	Blasting	Negligible	Minor

Underwater noise from vessels

5.2.63 Underwater sound from vessels is continuous, non-impulsive, and typically falls between 165 to 180 dB re 1µPa Root Mean Square (RMS) with most energy below 1 kHz, for vessels between 50 to 100 m in length (OSPAR, 2009).

5.2.64 Underwater sound from vessels is continuous and non-impulsive and typically falls between 165 to 180 dB re 1µPa (RMS) with most energy below 1 kHz, for vessels between 50 to 100 m in length (OSPAR, 2009). Sound emissions from vessels are unlikely to cause physical injury in terms of hearing impairment (e.g. AUD INJ) or mortality, but may result in behavioural changes, such as displacement of some cetaceans from the affected area (Benhemma-Le Gall *et al.*, 2021), or reduction in foraging activity (Wisniewska *et al.*, 2018).

5.2.65 The construction works, and therefore construction vessels, are limited to Peterhead Harbour. This limits the area of impact due to the breakwaters, which limit noise. It also limits the speed at which vessels can travel (less than 5 kn as per PPA Byelaws), which itself is a mitigation measure against generating underwater noise. The semi-enclosed nature of the harbour area limits the number of individual marine mammals that could be present during construction works. The ranges in SEL for LF cetaceans and PW indicate they are more

susceptible to impacts from underwater noise due to increased vessel use. Given Peterhead Harbour is an area of high androgenic activity, it is highly unlikely that any increase in the number of vessels around Smith Quay would impact LF cetaceans since they do not enter the harbour area. The magnitude of impact for LF cetaceans has been determined to be negligible and as such the significance of impact of an injury or disturbance for underwater noise from vessel traffic for LF cetaceans has been assessed as a **Minor**.

5.2.66 For PW, they are known to frequent the port area and therefore there is potential for impact due to increased vessel use. As such, the magnitude of impact to grey seal from injury or disturbance from underwater noise from increased vessel traffic is low, resulting in a significance of impact of **Minor**.

5.2.67 The presence of breakwaters limit access to the port area for fish, as well as limiting the extent of noise impacts outside the port. Furthermore the Project takes place within an already busy port with existing levels of background noise, with considerable distance to marine habitats such as PMF habitats and river mouths that could indicate high or valuable fish populations. Historically high levels of fishing and an absence of fish records in the Remote Operated Vehicle (ROV) survey indicate that the magnitude of impact to fish species will be negligible. As such, the significance of impact for fish is **Minor**, based on their international importance.

5.2.68 Table 5-14 summarises the likelihood and significance of impact for each species assessed.

Table 5-14 Likelihood and significance of impact from underwater noise from vessels on each species.

Hearing group	Likelihood of impact	Significance of impact
LF cetaceans	Negligible	Minor
HF cetaceans	Negligible	Minor
VHF cetaceans	Negligible	Minor
Phocid Pinnipeds	Low	Minor
Fish with a swim bladder	Negligible	Minor

Mitigation Measures

5.2.69 Mitigation to avoid injury risk to marine mammals is embedded into the project and will be extended to minimise the risk of disturbance, although no significant adverse impact is anticipated. Further detail on the planned mitigation (marine mammal observer) is provided below.

5.2.70 In addition, in order to prevent excessive harassment of marine mammals by vessels working on the Project, all vessels should follow the guidance set out in NatureScot's SMWWC

(NatureScot, 2017). This document provides best practice guidance on how to navigate vessels in the vicinity of marine mammals.

5.2.71 Where appropriate an embedded mitigation measure for piling is the use of vibro hammers to drive the piles to refusal prior to using impact and drilled piling techniques.

5.2.72 A EPS Risk Assessment (NIRAS, 2025e) has been prepared.

5.2.73 A CEMP will be prepared prior to construction commencing.

Marine Mammal Observer

5.2.74 To reduce the risk of injury to marine mammals to negligible levels, and to minimise disturbance, an MMO will be deployed during the following activities:

- Dredging
- Piling
- Rock breaking (mechanical)
- Rock breaking (Cardox).

5.2.75 Statutory Nature Conservation Agency Protocol for Minimising the Risk of Injury to Marine Mammals from Piling Noise (JNCC, 2010) will be applied and adapted to the specific requirements of the works to achieve effective mitigation.

5.2.76 A 500 m mitigation zone (MZ) will be implemented for all stated activities, irrespective of the range to which injury risk is calculated to exist. In all cases injury risk is less than 500 m.

5.2.77 For dredging, piling and mechanical rock breaking the MMO will also monitor in the direction of the harbour entrance (to distances noted in Table 5.10 of the EPS Risk Assessment (NIRAS, 2025e) , i.e. 1.5 km (harbour entrance area) for LF cetaceans (e.g. minke whale) and dolphin species during dredging, and 4.5 km (in practice any animal within range of detection) for harbour porpoise during piling) in order to minimise the risk of disturbance to these species. This extended MZ will be treated in the same manner and the 500 m MZ with respect to mitigation protocols.

5.2.78 Because the likelihood that cetaceans will occur in the inner harbour is very low a single MMO is considered to represent proportionate mitigation. The MMO will be located in a position to optimise ability to monitor both the works area and seaward direction, for example by being located towards the end of Albert Quay, between the works area and harbour entrance (Figure 5.2). The MMO will liaise directly with the works contractor and an individual within the contractor team will be nominated to support the implementation of mitigation protocols and supplement surveillance of the MZ where required.

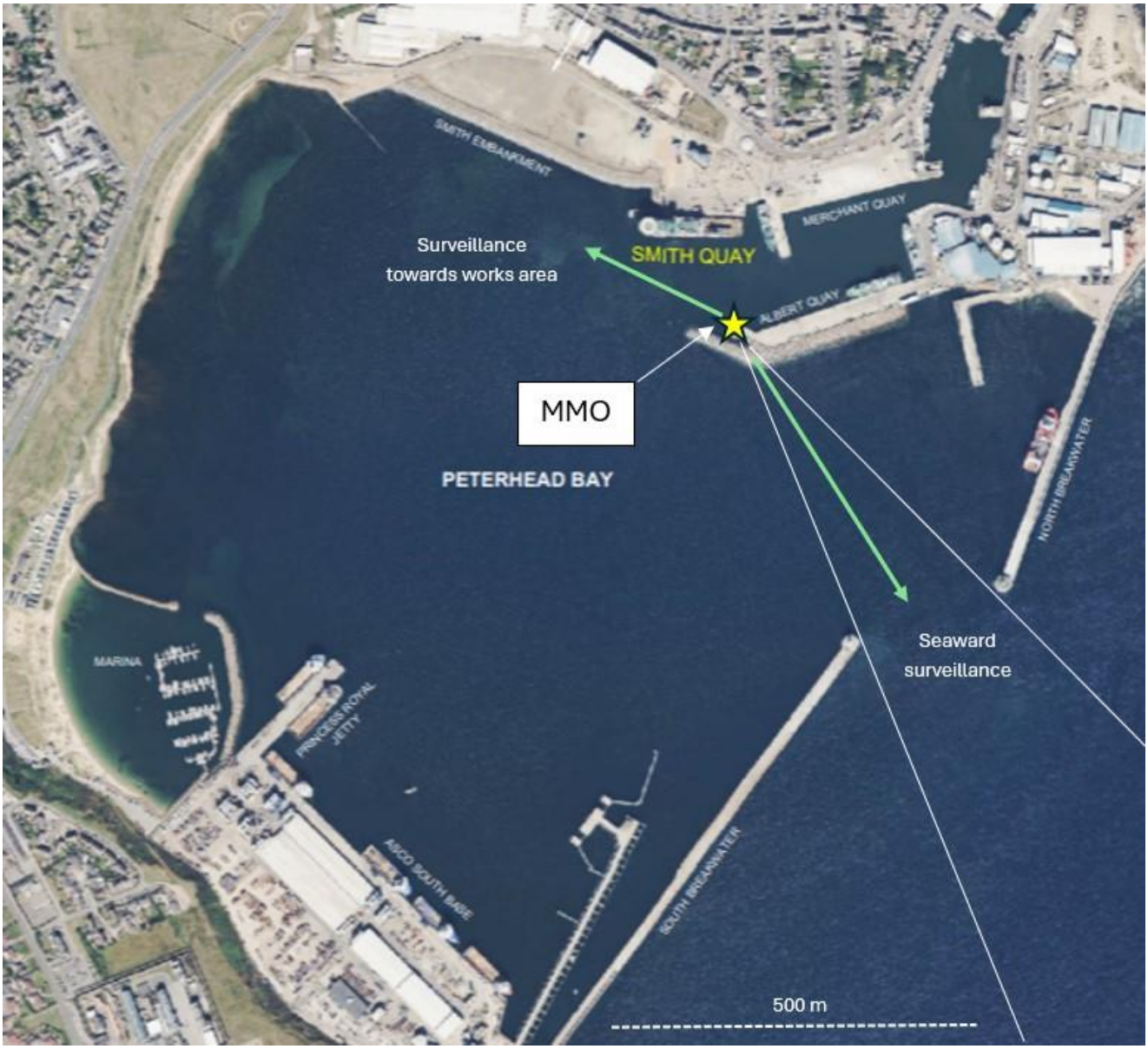

Figure 5.2 Proposed location for Marine Mammal Observer.

5.2.79 For hammer piling, such as used during offshore wind farm construction and in relation to which the mitigation protocols were developed, a soft start, i.e. a gradual increase in piling power, over a minimum of 20 minutes is required before piling can commence after a 30-minute pre-piling search where no marine mammals are detected within the MZ. For the current project, a short period of piling (minutes) will follow a period of drilling (approximately 4 hours). Drilling will effectively serve as a soft start to piling.

5.2.80 For dredging and mechanical rock breaking, positioning of the vessel, and starting up of equipment, will be considered to represent soft start. High intensity activities will be avoided

during the initial phase of these works, for a period of at least 20 minutes from initial activity (e.g. vessel positioning).

5.2.81 For Cardox use, the following additional practice will be adopted:

- Minimal charge size and number of charges to be used in all cases.

5.2.82 The use of acoustic deterrents is discounted as disproportionate for all activities, given the low likelihood of EPS being present within injury range. Acoustic deterrents would add unnecessarily to overall disturbance risk.

5.2.83 Should there be a pause in any mitigated activity of less than 10 minutes, provided that there has been ongoing surveillance, the activity may recommence. For pauses between drilling and piling, or breaks in piling, of more than 10 minutes, a 30 minute pre-search would be undertaken before the activity starts/re-starts. Surveillance around such pauses may be undertaken by the nominated MMO-liaison at the works site as maintaining full time MMO presence at the dedicated MMO location is considered disproportionate, given the low risk present.

5.2.84 The MMO protocols will include other marine megafauna, such as basking shark and seals (pinnipeds). As seals are present regularly in the harbour, works will only be delayed if any animal is present at very close range (e.g. within 50 m). Should a seal enter the MZ after commencement of an activity, including preparatory works such as vessel manoeuvring, it will be considered to have done so voluntarily and works will not need to pause.

Scottish Marine Wildlife Watching Code

5.2.85 All site personnel and contractors involved in marine operations will be briefed on and required to adhere to the SMWWC (NatureScot, 2017). This includes guidance on responsible behaviour around marine wildlife, vessel operation protocols, and avoidance of deliberate or accidental disturbance. The SMWWC will be applied consistently to all marine megafauna, including incidental sightings of species not specifically listed in the EA.

5.2.86 Vessel movements, construction activities, and any other operations with potential to disturb marine wildlife will be planned and conducted in a manner that:

- Avoids sudden changes in speed or direction near wildlife.
- Maintains appropriate distances from animals at all times.
- Reduces noise and visual disturbance where possible.

Residual Effects

5.2.87 Potential impacts on marine mammals and fish have been assessed to have no significant impacts, therefore it is not necessary to assess residual effects.

Cumulative Effects

5.2.88 As stated in Section 4 there are currently no other construction activities planned within or surrounding Peterhead Port during the Project. As such, no cumulative effects were identified associated with marine mammals and fish.

5.3. Benthic Ecology

Introduction

5.3.1 This section provides an assessment for benthic ecology, supported by a baseline characterisation survey.

Regulations and Guidance

5.3.2 Regulations and guidance pertaining to ecology and biodiversity are outlined in Section 3. This section specifically details the regulations and guidance to benthic ecology.

Planning Framework

5.3.3 The SNMP provides GEN, of which the following apply to the benthic ecology assessment:

- GEN 9 Natural Heritage: Development and use of the marine environment must:
  - Comply with legal requirements for protected areas and protected species;
  - Not result in significant impact on the national status of PMFs; and
  - Protect and, where appropriate, enhance the health of the marine area.
- GEN 10 Invasive Non-Native Species: Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.

Assessment Methodology

Baseline Methodology

5.3.4 A desk-based evaluation concluded that available data were too old to accurately describe the potential benthic features at Smith Quay. As such, it was determined that a benthic survey should be undertaken in the vicinity of the quay, to include the dredge pocket and the extent of the extension.

Benthic Survey

5.3.5 The survey was carried out by Spectis Robotics Ltd in collaboration with NIRAS on 27 November 2024. There were 17 transects planned and completed (Figure 5.3).

5.3.6 This survey used a ROV. Results were recorded and identified biotope complexes mapped in accordance with the European Nature Information System. The full report is attached in Annex 2 Benthic Technical Report.

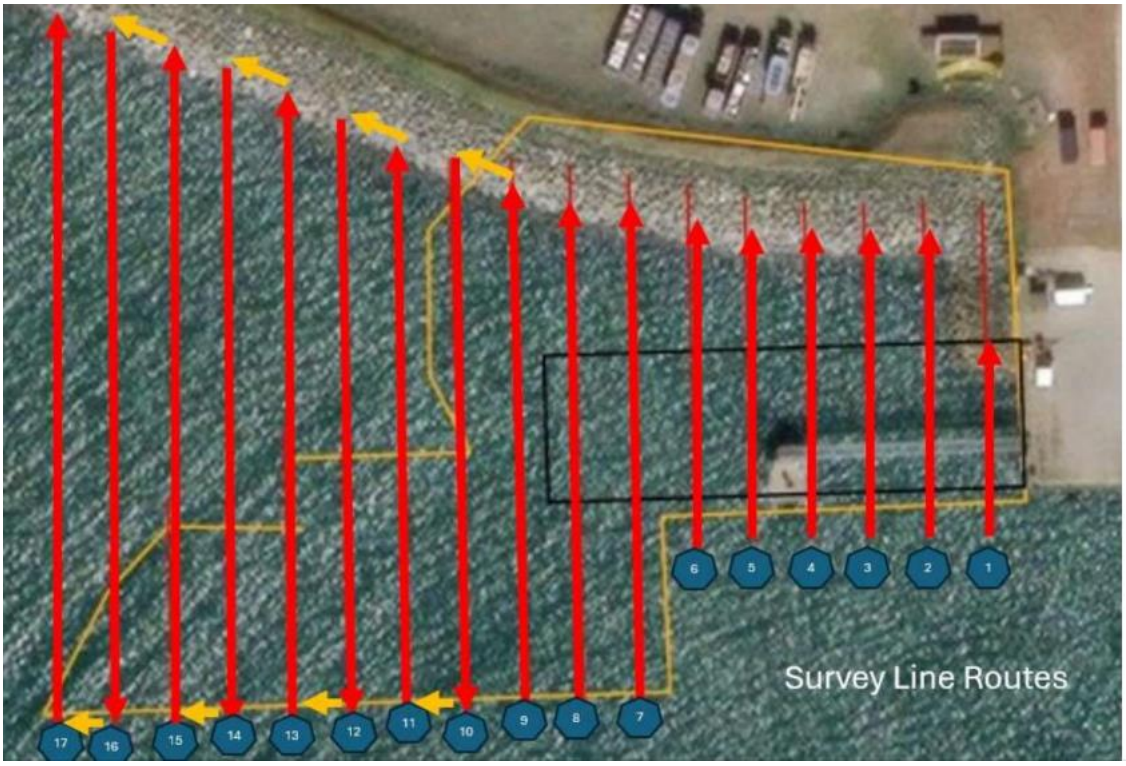

Figure 5.3 Survey transects as planned - 27.11.2024.

Baseline

Statutory Designated Sites

5.3.7 There are no statutory designated sites within the development area, or within Peterhead Port.

5.3.8 The habitat within the harbour falls outside of the boundaries of any protected site such as SAC; however, the habitats were nonetheless checked for presence of any features resembling Habitats Directive Annex I habitat (e.g. reef) and against the Scottish list of PMFs.

Environment

5.3.9 The proposed site lies within the Peterhead Harbour waters on the western end. Smith Quay is 120 m long and 40 m wide suspended deck quay. The area is a western extension in 10 m deep water of the outer harbour quays at Peterhead. The piles are socketed into granite rock that underlies Peterhead. There is an adjacent working area of 16,000 m^2 with additional reclaimed land behind the Quay.

Benthic Habitat

5.3.10 A seabed visual inspection survey was commissioned using a ROV. The ROV collected 250 still images from 17 transect lines and at least one video from each line.

5.3.11 Habitat identified from the ROV survey was divided into three categories: Artificial reef – Rock armour with/without algal colonisation; Natural reef – smaller, natural stones with epifaunal

species and algal colonisation; Sediment – soft sediment (predominantly sandy). An additional category (N/A) was used to describe non-identifiable habitat type due to poor image quality.

5.3.12 Transects 1 to 12, the habitats encountered were relatively consistent. In deeper water the seabed was fine sediment, often rippled and in some areas evidence of infauna such as work casts and burrow entrances could be seen. When the rock armour protecting the reclaimed area was encountered, large boulders were seen, supporting epifauna. In shallower waters, various types of red algae were observed as well as sugar kelp (*Saccharina latissimi)* and sea lettuce (*Ulva Lactuca)*. Near the water surface, likely the intertidal zone, boulders were covered with barnacles, with occasional limpets. Above the barnacles were fucoid algae with saw wrack (*Fucus serratus)* and spiral wrack (*Fucus spiralis)*, with green algae, most likely gutweed (*Ulva intestinalis)*. Mobile epifauna was observed on transects 1 to 12, including squat lobster, velvet swimming crab (*Necora puber)* and common starfish (*Asterias rubens)*.

5.3.13 In transects 13 to 17, located outside the proposed quay extension area, habitats of mixed-size large particles were identified. These habitats align with the description of a stony reef with overall low 'reefiness,' as per the guidance provided by Irving (2009). This classification considers both the physical structure and biotic composition.

5.3.14 Figure 5.4 presents the habitat classifications identified. The size of the boulders further away from the intertidal area was generally smaller than those present around the rock armour/intertidal zone and there was a substantial separation between rock armour at the intertidal zone and stony ground areas. This habitat does not appear to have been formed from dumped material as the size range is very different to the material deposited in the intertidal and shallow subtidal to protect the reclaimed land. Whether or not the reef has formed as a result of historic dredging of fine sediment can only be speculated upon, but this area is assumed to be low quality reef. With the exception of the fine sediment (sandy) area, no other natural habitats were identified in the survey and there was no evidence of PMFs.

Impact Assessment

5.3.15 Benthic Habitats within the Proposed Development are considered receptors of low-moderate ecological value due to the baseline conditions of artificial reef (low), fine sediment habitat (low) and potential low-quality reef (precautionarily ascribed moderate value) within a busy port harbour and absence lack of any PMFs. The site does, however, support features and species considered to enrich the habitat resource within the immediate environs of the site. These would benefit from mitigation as a good practice measure.

Loss of habitats (O)

5.3.16 There will be a permanent loss of some benthic habitats within the project footprint (Figure 2.1). The development will not overlap with areas of potential natural (low quality) reef identified during benthic survey, since these areas lie outside the footprint of the proposed quay extension. The magnitude of this impact is considered to be Low; the area of impact is expected to be <5,000 m^2, with loss of predominantly artificial reef and soft sediment habitat within the project boundary. This represents a **Negligible** significance impact for the low value receptors concerned.

Figure 5.4 Habitat Classifications in the survey area.

Release of toxic contaminants (C,D)

5.3.17 During construction and decommissioning activities accidental release of hydrocarbons or other hazardous substances could result in the contamination of the benthic marine environment. The impacts following such release of hazardous substances can be acute, increasing mortality rates, or chronic, with organisms being affected over an extended period of time. The risk of such an incident occurring will be minimised by implementing an CEMP and use of well-maintained vessels and other machinery. The magnitude of impact is considered to be Negligible.

5.3.18 Toxic contaminants can further be released during the dredging activities, should contaminants be present in sediments and these are disturbed by construction works. Analysis of sediment samples in the proposed dredging will provide information on this risk and relevant information will be included in the application for the dredging licence. For the purpose of this EA it is assumed that should contaminants be present in local sediments suitable mitigation would be developed via the dredging licence application. The magnitude of impact in relation to mobilisation of toxic contaminants is therefore assumed to be Negligible.

5.3.19 The receptor value of the benthic habitat is low-moderate. Taking into account the Negligible magnitude as described above the predicted impact to benthic habitat is concluded to be **Negligible**.

Sediment smothering (C,D)

5.3.20 Peterhead Bay in general is exposed to wave and tide action, despite the presence of the outer breakwaters. Therefore, although there will be some mobilisation of sediments associated with the works, there is not expected to be more than short term accumulation of fine sediments that might affect adjacent habitats.

5.3.21 The adjacent benthic habitats will be exposed to a temporary smothering from sediments falling out of suspension. There is very limited epifauna and epiflora and the habitats are considered to have low sensitivity to such temporary smothering. The dispersal range of any suspended sediments is expected to be highly localised due to the presence of breakwaters.

5.3.22 Overall, the effects are expected to be of **Low magnitude**. Receptor value is **Low-Moderate** and the impacts to benthic habitats as a result of sediment smothering are therefore considered to be of **Negligible** to **Minor** significance.

Summary

5.3.23 Table 5-15 summaries the findings of the impact assessment undertaken for the receptor group benthic habitats.

Table 5-15 Summary of impact assessment for benthic habitats.

Receptor	Nature of Impact	Magnitude of Impact	Significance of Impact
Benthic Habitats	Habitat Loss	Low	Negligible
	Release of toxic contaminants	Negligible	Negligible
	Sediment smothering	Low	Negligible to Minor

Mitigation Measures

5.3.24 No mitigation is proposed given the non-significant impact of the Project on benthic ecology. Construction activities will be restricted to the area detailed in the marine licence to limit any risk to the surrounding environment.

Residual Effects

5.3.25 Potential impacts on benthic ecology have been assessed to have no significant impacts, therefore it is not necessary to assess residual effects.

5.4. Marine Ornithology

Introduction

5.4.1 Impacts on marine birds are identified and subject to detailed impact assessment, with mitigation proposed, potential cumulative impacts and lastly residual impacts following assessment of their significance.

Regulations, Guidance and Sources of Information

5.4.2 In addition to guidance set out in Sections 3 the assessment completed for marine ornithology has regard to guidance to support Offshore Wind Applications published by NatureScot (2025b) which has application to other developments, including ports. Key information sources are referred to in the next section.

Assessment Methodology

Desk Study

5.4.3 A desk study was conducted to inform the characterisation of the existing baseline conditions; the following sources were consulted to identify and assess which marine birds may be using the Peterhead Bay and surrounding waters and for what purposes. Information on population sizes, seasonal trends, foraging characteristics and associated designated sites was also sought:

- Relevant designated sites (SSSIs, SPAs, MPAs), available through NatureScot and JNCC;
- NatureScot's 'SiteLink' Protected Areas portal;

- Advice on specific designated sites provided by NatureScot in their Screening Opinion for the project; and
- Marine Scotland's National Marine Planning interactive tool.

Determining Impact significance

5.4.4 Determining the significance of impacts to marine birds follows the methodology set out in Section 4: Methodology. Marine birds are potentially sensitive to a range of pressures; those scoped into assessment are detailed in Table 4-1.

5.4.5 An assessment of the possible risks from the Proposed Works including identification of injury or disturbance pathways for marine birds, will help to ensure safe operations with a favourable conservation outcome. As detailed in Table 4-1, the potential pressures that have been scoped into this assessment are:

- Physical disturbance/displacement from construction activities due to noise; and
- Water quality impacts due to the potential release of contaminants.

Baseline

5.4.6 The RIAA and MPA Assessment (NIRAS, 2025b) provides an assessment in relation to the integrity of European sites that were screened into assessment. The species present as designated features of these protected sites are considered here in the context of the EA.

5.4.7 There are several marine bird species present in designated sites local to Peterhead Port. However, there is no direct overlap between sites designated for relevant bird species and assemblages and the Project area. Given the small-scale nature of the development, a range of 15 km was applied during screening and those sites within range were identified. The sites identified were Buchan Ness to Collieston Coast SPA, Bullers of Buchan Coast SSSI, Ythan Estuary, Sands of Forvie and Meikle Loch SPA, Loch of Strathbeg SPA, and Collieston to Whinnyford Coast SSSI. The bird species that have been scoped in to this assessment are as follows:

- Black-legged kittiwake (*Rissa tridactyla*);
- Common guillemot (*Uria aalge*);
- Herring gull (*Larus argentatus*);
- European shag (Phalacrocorax aristotelis);
- Northern fulmar (*Fulmarus glacialis*);
- Common tern (*Sterna hirundo*);
- Sandwich tern (Sterna sandvicensis);
- Little tern (*Sternula albifrons*); and
- Razorbill (*Alca torda*).

5.4.8 The breeding seabird colony in the Buchan Ness to Collieston Coast SPA and Bullers of Buchan SSSI is the largest in north-east Scotland. Amongst this assemblage, the breeding population of kittiwake is of international importance in its own. Furthermore, the breeding populations of guillemot, shag, razorbill, and herring gull are each of national importance in

their own right. The assemblage also includes a large breeding population of fulmar, about 1000 pairs, and smaller numbers of puffin.

5.4.9 The Ythan Estuary, Sands of Forvie and Meikle Lock SPA protects over 7% (up to 1125 pairs) of Sandwich tern and around 2% (up to 41 pairs) of little tern GB breeding populations. This SPA has the largest breeding colonies of both these species in Scotland. This SPA also protects around 2% (up to 265 pairs) of the common tern GB breeding population.

5.4.10 The Loch of Strathbeg SPA and SSSI provides wintering habitat for a number of important wetland bird species, particularly wildfowl. It regularly supports populations of sandwich terns and is believed to support approximately 280 breeding pairs (2% of GB population) of sandwich terns.

5.4.11 When the Collieston to Whinnyford Coast SSSI is considered in conjunction with the seabird colonies of the neighbouring Bullers of Buchan SSSI as part of the Buchan Ness to Collieston SPA, the breeding population of kittiwake in particular, contribute to internationally important numbers of this species.

5.4.12 During visits to site European shag were regularly observed. The harbour area is understood to be an important roosting and feeding site for this species. Shags often rest on harbour structures or shorelines between foraging trips and the rich coastal waters and fishing activities around Peterhead provide abundant small fish (such as sandeels), which are the shag's primary food (State of the Coast, n.d.).

5.4.13 For the purposes of this assessment, the above species, and other species potentially occurring, have been grouped together as one receptor. Because many of these species are associated with European sites the importance of this receptor group is considered to be 'international importance'.

Impact Assessment

Physical Disturbance/Displacement

5.4.14 The sources of disturbance associated with construction activities for the Project in relation to marine birds could include noise, lighting, presence of people and plant machinery, and vehicular and shipping traffic, both onshore and offshore. Impacts could be direct or indirect.

5.4.15 Potential direct disturbance for marine birds includes disorientation from artificial light, in-air noise from construction activities or the physical presence of vessels or equipment causing birds to take flight and abandon foraging or resting areas. Artificial lighting from vessels, structures, and shore-side equipment or buildings can in principle disorient seabirds, especially those that fledge at night, potentially leading to injury or death. No important nesting habitat for marine birds is understood to be present within the harbour, indicating that there would not be an impact on nesting birds from this project. Vessels can disturb birds on the water, causing them to flee or dive, and potentially displace them from foraging areas. The area is an existing active port with operations occurring around the clock. The increase in the number of vessel movements associated with the construction phase is minimal and the wider environment is already busy and subject to nighttime lighting; therefore, it is unlikely that marine birds would be notably impacted by disturbance during construction. As set out

in section 2.5, the planned operation of the site involves the same vessel movements and site operations allowed under the current Harbour Revision Order. Therefore, during the operation phase, vessel movements will return to existing levels.

5.4.16 Indirect disturbance could include underwater noise generated from construction activities causing prey species to flee the area and thereby impacting the abundance of food sources. The area of impact from underwater noise will be limited to the harbour area for fish prey species. Such effects would be expected to be short term with rapid recovery (return) after cessation of works. Given that the port area is only a small proportion of the total available foraging area for birds, it is not expected to impact marine birds significantly.

5.4.17 Overall, the effects are expected to be of Negligible magnitude. Receptor value is International and the impacts to marine ornithology due to direct and indirect disturbance are therefore considered to be of **Minor** significance.

Water Quality

5.4.18 Water quality encompasses impacts directly to bird species and indirectly via bird prey species. In terms of direct impacts, contaminated sediment (if present) could be released during dredging activities causing pollutants to enter the water column and to potentially be ingested by or otherwise exposed to marine birds. Dredging operations and other construction activities are also known to cause turbidity, which can cause difficulty for piscivorous species to locate prey, impacting feeding success.

5.4.19 In terms of indirect impacts, changes in water quality from construction activities could potentially affect prey species, with consequently effects for marine birds feeding upon such organisms.

5.4.20 As discussed in the benthic habitats assessment in Section Benthic Ecology, and based on the sediment sample results from core and grab samples taken in 2025 (NIRAS, 2025d), appropriate mitigation will be put in place to ensure no significant contamination of the marine environment occurs.

5.4.21 Peterhead Port is potentially inside the foraging range for a number of qualifying seabirds from designated sites, however the Project area is of small scale, with the extension extending up to 85 m x 25.25 m, and a total construction area of 13,000 m^2 (inclusive of the dredge pocket). The bird species screened in typically have very large foraging ranges (up to 1000's of km^2 depending on the species), indicating that the area around the Project is of an insignificant size and is unlikely a key foraging site for many species.

5.4.22 Increased turbidity around the construction activities is expected to be short term and localised and is not likely to impact birds when foraging.

5.4.23 Overall, the effects are expected to be of Negligible magnitude. Receptor value is International and the impacts to marine ornithology due to water quality are therefore considered to be of **Minor** significance.

Summary

5.4.24 Table 5-16 summaries the findings of the impact assessment undertaken for the receptor group marine ornithology.

5.4.25 Given that the Project is of small scale and the construction works are planned to be short-term duration (approximately 13 months), the magnitude of impact to marine birds has been deemed negligible for all impacts. As such, based on their designation status, the significance of impact was deemed to be **Minor** for all impacts.

Table 5-16 Summary of impact assessment for marine ornithology.

Receptor	Nature of Impact	Magnitude of Impact	Significance of Impact
All Species	Physical displacement/disturbance from construction activities	Negligible	Minor
	Water quality	Negligible	Minor

Mitigation Measures

5.4.26 No requirement for additional mitigation is identified. However, it is noted that some secondary mitigation will be in place (and is assumed within the assessment). Of particular note for marine ornithology a CEMP will be in place.

Cumulative Effects

5.4.27 No cumulative effects were identified associated with marine birds.

Residual Effects

5.4.28 Potential impacts on marine birds have been assessed to have no significant effects, therefore it is not necessary to assess the residual effects.

6. Public Amenity (Bathing Waters)

6.1. Introduction

6.1.1 This section provides the impact assessment relevant to bathing water quality.

6.2. Baseline

6.2.1 Coastal and inland surface waters where a large number of people bathe – which can mean swimming, paddle boarding, and other activities - can be designated as bathing waters by Scottish Ministers. There are over currently 80 designated bathing waters across Scotland. Bathing water season is between 01 June to 15 September, with SEPA monitoring each location pre-season beginning the 15 May to the end of the season.

6.2.2 Peterhead Lido is a sandy public beach and marina area, around 300 m long, and 80 to 150 m wide depending on the tide. The lido is enclosed by breakwaters, with a boating marina, bathing waters and jetty. Peterhead Marina is within the Peterhead Bay harbour breakwaters

and is approximately 1 km from the Project Area (Figure 6.1). The Peterhead Lido bathing water is in a Nitrate Vulnerable Zone (SEPA, n.d.).

6.2.3 Sediment sampling undertaken by NIRAS as part of a dredging assessment for Peterhead Marina in 2025 found no Action Limit 1 or 2 exceedances for any substances (NIRAS, 2025c).

6.2.4 Further sediment survey was undertaken by NIRAS in 2025 around Smith Quay as part of the dredging works to determine sediment type and presence of any contaminants (NIRAS, 2025d). Both surface grab and vibro core samples up to 3 m depth were taken. The grab samples results showed Action Level 1 exceedances were found at one sample location for copper, diben(ah)anthracene, fluoranthene, pyrene, and total hydrocarbons. However, across all samples the average concentration of all contaminants was below Action Level 1 thresholds. There was a limited proportion of gravel in the grab samples compared to core samples (see below) which likely relates to the sampling equipment which does not reliably collect coarse particles. These grab samples were silty sand, containing 45 to 63% sand and 37 to 54% silt.

6.2.5 Core samples results indicated no Action Level 1 or 2 exceedances. These samples were gravelly sand with a relatively high proportion of silt also present (sand (26 to 51%), gravel (12 to 63%), and silt (11 to 56%)) (Table 6-1).

Table 6-1 Classification of sediment samples taken at Smith Quay for dredging works.

Sample ID (sample depth)	Textural Group Classification	Folk and Ward Description	Folk and Ward Sorting	Major Sediment Fractions		
				% Gravel	% Sand	% Silt
MAR02674.001 (core, 0 m)	msG: Muddy Sandy Gravel	Coarse Sand	Very Poorly Sorted	40.43	44.07	15.50
MAR02674.002 (core, 1 m)	gmS: Gravelly Muddy Sand	Medium Sand	Very Poorly Sorted	22.08	50.58	27.35
MAR02674.003 (core, 2.4 m)	gmS: Gravelly Muddy Sand	Medium Sand	Extremely Poorly Sorted	29.84	40.06	30.10
MAR02674.004 (core, 0 m)	msG: Muddy Sandy Gravel	Very Fine Gravel	Extremely Poorly Sorted	49.21	37.87	12.92

Sample ID (sample depth)	Textural Group Classification	Folk and Ward Description	Folk and Ward Sorting	Major Sediment Fractions		
				% Gravel	% Sand	% Silt
MAR02674.005 (core, 1.5 m)	msG: Muddy Sandy Gravel	Very Fine Gravel	Very Poorly Sorted	62.84	25.81	11.35
MAR02674.006 (core, 3 m)	gM: Gravelly Mud	Very Coarse Silt	Extremely Poorly Sorted	12.32	31.83	55.85
MAR02674.007 (grab, 0 m)	(g)mS: Slightly Gravelly Muddy Sand	Very Fine Sand	Poorly Sorted	0.07	63.05	36.87
MAR02674.008 (grab, 0 m)	(g)mS: Slightly Gravelly Muddy Sand	Very Coarse Silt	Poorly Sorted	0.06	57.66	42.28
MAR02674.009 (grab, 0 m)	(g)sM: Slightly Gravelly Sandy Mud	Very Coarse Silt	Very Poorly Sorted	0.44	45.34	54.22

6.2.6 Peterhead Lido is considered to be a receptor of High Local importance within this assessment.

6.3. Impact Assessment

6.3.1 The potential impacts considered here reflect different pathways by which bathing water quality, and amenity use more broadly within the marina/Lido area, could potentially be affected by the proposed works which will occur approximately 1 km away on the opposite side of the bay.

Release of suspended sediments (C,D)

6.3.2 Construction works, particularly dredging, will mobilise sediment into the water column. Sand and gravel will fall out of suspension very quickly and are not expected to be present in any plume beyond the immediate area of works and will therefore not impinge on the bathing water area. Fine sediments will remain in suspension for longer and depending up prevailing

conditions could be transported towards the marina area. The enclosed nature of the marina entrance, with a small opening between breakwaters, will however limit sediment transport directly into the marina and lido area.

6.3.3 Only dredging works are expected to have potential to mobilise substantial volumes of fine sediment, other works such as piling being unlikely to mobilise material to any greater extent than would occur under natural conditions, such as storms. Dredging is programmed to occur over approximately 11 weeks, representing a short term impact.

6.3.4 If possible, dredging works will be completed outside of the bathing season (1 June to 15 September); however, this will be influenced by the time required to secure relevant consents and contractor availability and in order to meet the overall construction programme this may not be possible. In the event that dredging may coincide with the bathing season it is proposed that a programme of bathing water quality and suspended sediment monitoring be established in order to evidence that bathing waters are unaffected by the works, with adaptive mitigation to be applied if necessary.

6.3.5 The only envisaged mechanism for an impact on bathing water quality is via elevated suspended sediments within the lido area. Therefore, should monitoring indicate that suspended sediments are significantly elevated within the lido as a result of dredging, and this is correlated with a reduction in bathing water quality (i.e. increased microbial indicators), mitigation would be implemented to limit the movement of suspended sediments into the lido. This could be in the form of a silt curtain across the lido entrance, for example. This would also serve to minimise secondary impacts to bathing amenity, e.g. temporary deposition of fine sediments on the beach.

6.3.6 Detailed protocols for the monitoring will be included in the CEMP but are envisaged to include weekly water quality sampling (replicating SEPA bathing water quality monitoring methods, including microbial analysis at an accredited microbiological laboratory under UKAS quality system) supplemented with suspended sediment monitoring around the lido entrance.

6.3.7 The impact magnitude is considered to be Medium. Taking into account the high local importance of the receptor this represents a **Minor** significance impact.

Release of toxic contaminants (C,D)

6.3.8 The risk from spills of oil, fuel or lubricants will be mitigated by adherence to a CEMP to minimise risk of such spills occurring, and implementation of Peterhead Port's Oil Spill Contingency Plan in the event that a spill does occur.

6.3.9 Sediment sample testing revealed limited exceedance of Action Level 1 contaminant levels in one grab sample, indicating localised contamination of copper and hydrocarbons (PAHs). No exceedance of the upper threshold (Action Level 2) was found. The source of the contamination is unknown, but such levels are not unusual in a harbour environment where fuel and lubricant oils are routinely used. These contaminants are present in superficial (i.e.

surface) fine sediments which will be naturally mobile under certain conditions such as storms. There is no indication of contamination in deeper sediments.

6.3.10 The impact magnitude is considered to be Low. Taking into account the high local importance of the receptor this represents a **Minor** significance impact.

Noise from construction activities (C,D)

6.3.11 The potential for the works to be disturbing to users of the marina/Lido area is considered here. The considerable distance between the works and marine/Lido area (>1 km) will limit received noise levels for users of this area and limited reduction in amenity value is expected over the course of the works. Depending on the wind direction, piling and subsequent operations may be audible at times. This would occur over a period of weeks to months, representing a short term impact. In the context of a busy harbour environment and with the Lido area itself being an active marina this is not considered to represent more than a Low magnitude impact. Taking into account the high local importance of the receptor this represents a **Minor** significance impact.

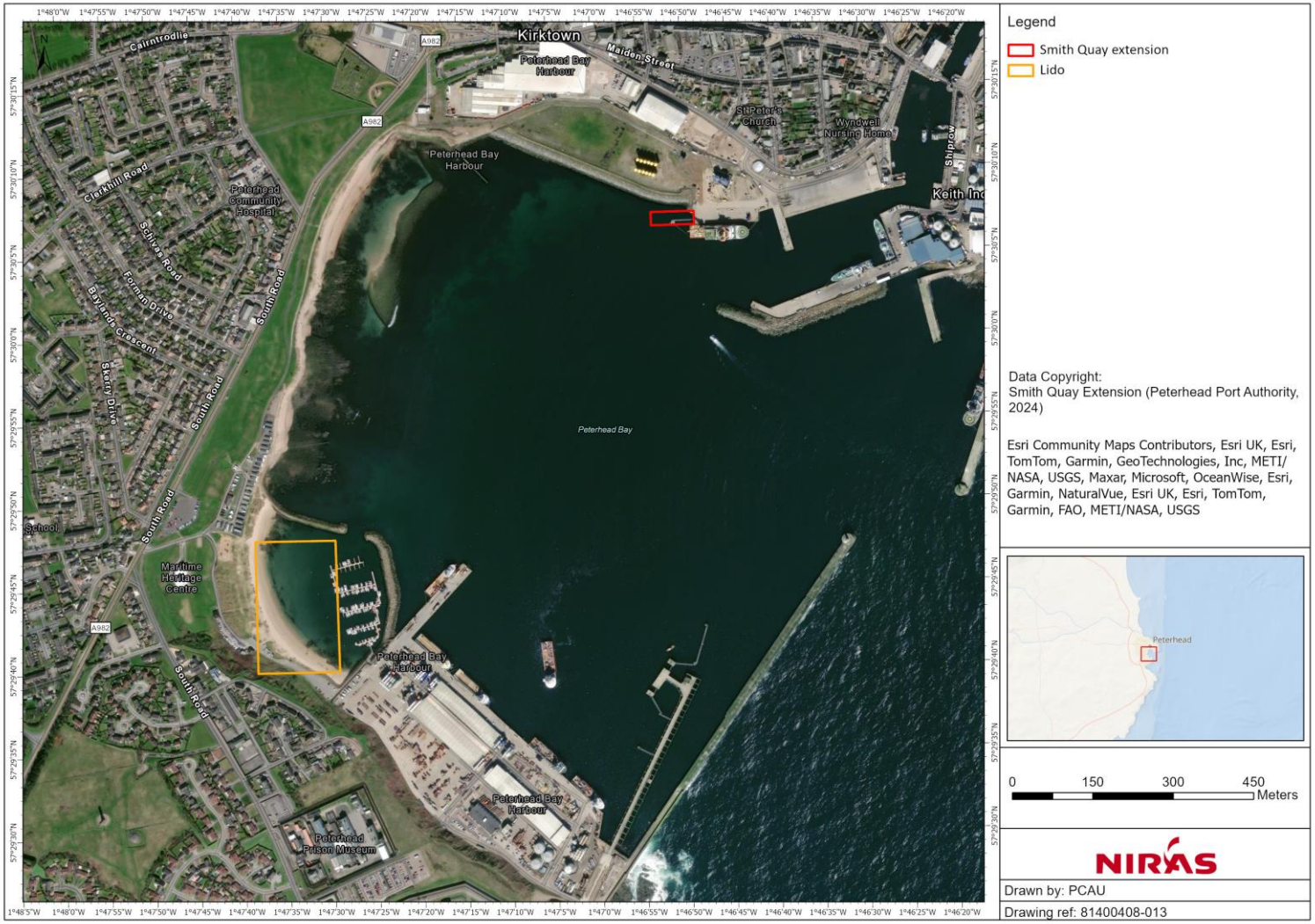

Figure 6.1 Location of Peterhead Lido in relation to Smith Quay.

Summary

6.3.12 Table 6-2 summaries the findings of the impact assessment undertaken for the receptor bathing water. water quality.

6.3.13 Given that the Project is of small scale and the construction works are planned to be short-term duration (approximately 13 months), the magnitude of impact to bathing waters has been deemed low to medium. As such, based on the High Local importance of the receptor, the significance of impact was deemed to be **Minor** for all impacts.

Table 6-2 Summary of impact assessment for bathing waters.

Receptor	Nature of Impact	Magnitude of Impact	Significance of Impact
Bathing Waters	Release of suspended sediments	Medium	Minor
	Release of toxic contaminants	Low	Minor
	Noise from construction activities	Low	Minor

6.4. Mitigation Measures

6.4.1 No requirement for additional mitigation is identified. Best practise measures within the CEMP will limit impacts of the works.

6.5. Cumulative Impact

6.5.1 As stated in Section 4 there are currently no other construction activities planned within or surrounding Peterhead Port during the Project. As such, no cumulative effects were identified associated with water quality.

6.6. Residual Impact

6.6.1 N/A.

7. Public Amenity (Airborne Noise, Air Quality and Traffic)

7.1. Introduction

7.1.1 During the construction phase, additional environmental considerations arise, primarily relating to the socioeconomic and human environment, air quality, airborne noise, and traffic impacts. These matters are addressed here to ensure compliance with Scottish and UK regulations and best practices. This section provides the legal context, describes the baseline

conditions in and around Peterhead Smith Quay, and assesses the potential effects during construction along with proposed mitigation measures.

7.2. Regulations and Guidance

7.2.1 Multiple frameworks guide the assessment and management of socioeconomic, noise, and traffic issues for marine construction projects in Scotland:

- EIA Regulations: The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and Town and Country Planning (EIA) (Scotland) Regulations 2017 require consideration of impacts on population, human health, material assets, etc., even if a full EIA is not mandatory. In this case, the EIA Screening Opinion confirms that significant effects are expected, but this EA still addresses these factors for due diligence.
- Harbours Act 1964 (Transport Scotland): A Harbour Revision Order is being sought under the Harbours Act, and Transport Scotland will review the project under this process. This ensures navigation safety and that any traffic or access issues associated with the quay extension are acceptably managed under national transport guidance.
- SPP 2014 and NPF4: Scottish planning policy (Scottish Government, 2014) emphasises safeguarding community amenity, health, and quality of life during development. NPF4 (effective 2023) and the Aberdeenshire Local Development Plan 2023 align with these principles. While this marine project does not require planning permission for below-high-water works, requirements of SPP/NPF4 – e.g. minimising noise, dust, traffic disruption, and risks to people – will be upheld.
- Health, Safety and Environmental Regulations: Construction will adhere to the Control of Substances Hazardous to Health Regulations 2002 (for handling hazardous materials) and the Environmental Protection Act 1990 duty of care for waste. All contractors will implement a project-specific CEMP to ensure compliance with pollution prevention guidelines and local authority requirements on noise, working hours, and dust control. Peterhead Port's Oil Spill Contingency Plan will be implemented in the event of any such marine pollution incident.

7.3. Baseline Conditions

Site Context

7.3.1 Smith Quay is within Peterhead Port, an active deep-water harbour serving diverse sectors (oil & gas, renewables, fishing and leisure activities). The quay's surroundings combine industrial port facilities and nearby town areas. The immediate on-site land use is port/marine, with no public amenities or tourist attractions within the construction footprint.

Socioeconomics

7.3.2 The town of Peterhead is located north of Smith Quay, with the closest residential dwelling approximately 180 m northeast of the works. The part of the town closest to the site is a conservation area of Peterhead of special architectural and historic interest (Peterhead Central (CA427)) (Historic Environment Scotland, 2025). Peterhead Old Parish Church (LB39671) is the only Category A Listed Building located within Peterhead Central and at a distance of 350m from the site. Outside of Peterhead Central there are two category B Listed

Building located 0.4 km northwest of Smith Quay; 1 ST. Peter Street (LB39816) and 3, 5 ST. Peter Street (LB39817).

7.3.3 Peterhead is the largest town in Aberdeenshire with a population of 19,791 in 2022 (Scotland's Census, 2022). Peterhead's economy is closely associated with its port, which remains the UK's largest fishing port by landings and is a location for offshore industry operations. Smith Quay is important for subsea engineering, decommissioning, and energy sector vessels. To the south of the bay are recreational areas such as Peterhead Bay Marina, a sailing club, and a holiday park, separated from Smith Quay by water and breakwaters. Port activities are a source of local employment and economic activity. According to the 2022 Scotland Census, the town has a relatively high proportion of working-age residents, though it also shows signs of demographic ageing in some neighbourhoods. Peterhead has lower-than-average levels of higher education attainment compared to national figures, and certain areas fall within the Scottish Index of Multiple Deprivation due to factors such as income, employment, and health outcomes. The town has a mix of owner-occupied and social housing, and while unemployment is not markedly high, underemployment and seasonal work are common. There are no hospitals, schools, or highly sensitive public facilities immediately nearby.

Air Quality

7.3.4 Aberdeenshire Council has not designated any Air Quality Management Area near Peterhead, suggesting that levels of pollutants such as NO_2 and PM_{10} remain below regulatory thresholds. Aberdeenshire Council's Local Air Quality Management (LAQM) (Aberdeenshire Council, 2023) confirm no exceedances of NO_2, PM_{10}, or other pollutant limits, even at the busiest urban locations. Roadside monitoring in Peterhead indicates annual mean NO_2 concentrations around *13.2–17.8* µg/m^3 (Aberdeenshire Council, 2025); below the Scottish objective of 40 µg/m^3 (for comparison, the Scottish annual objective for PM_{10} is 18 µg/m^3). Particulate matter levels are likewise low; Aberdeenshire Council does not operate PM_{10}/$PM_{2.5}$ monitors in Peterhead, as historically there has been no risk of breaching standards. Background PM_{10} concentrations in the area are estimated on the order of 10–15 µg/m^3 annual mean, within the 18 µg/m^3 limit.

7.3.5 The baseline air quality at the site reflects typical conditions for a coastal town with moderate traffic. While port activities, including emissions from ships and equipment, add to overall pollutant levels, the open coastal environment facilitates dispersion: prevailing sea breezes tend to carry emissions away and dilute them rapidly over the North Sea or along the coast. There are no street canyon effects or topographic traps around Smith Quay; the area is exposed and well-ventilated. As a result, busy days at the harbour or peak traffic hours have not led to pollutant build-up beyond health thresholds.

Airborne Noise

7.3.6 Peterhead Port is an active industrial area, so ambient noise levels around Smith Quay are higher than a rural or suburban baseline. There has not been continuous long-term noise monitoring at Smith Quay itself, but previous studies give an indication of baseline levels. For example, a 2012 noise monitoring survey (Green Cat Renewables, 2012) (conducted for a proposed harbour wind turbine) measured background sound in the Peterhead Harbour area. Near the harbour (e.g. Harbour Road, ~180 m from Smith Quay), typical background noise

levels (LA90) were on the order of ≈37–40 dB(A) at night and ≈45–50 dB(A) during quiet daytime periods under low wind conditions. By comparison, truly quiet residential areas (far from industry) might have night-time backgrounds in the low 30s dB. In Peterhead's case, the proximity of port operations means residents near Smith Quay experience a slightly elevated baseline noise environment. Port activity decreases during nighttime hours but does continue on a 24 hour basis. During active port operations, momentary noise levels can be higher. For instance, working fishing boats, cranes, or Heavy Goods Vehicle (HGV) movements create intermittent peaks – a ship's engine or unloading activity might be 55–60 dB(A) at the nearest houses for short periods in daytime.

7.3.7 Aberdeenshire Council has not designated Peterhead as a Noise Management Area, implying community noise levels have historically remained within acceptable ranges (no widespread noise complaints on record). The nearest sensitive receptors are residential properties ~180 m away. Recreational areas, including the marina and sailing club, are situated across the bay about 0.5 to 1 kilometre away, where the impact of port noise is reduced because of increased distance.

Traffic and Access

7.3.8 Road access to Smith Quay is available via Merchant's Quay and Harbour streets, which connect to the A90 trunk road leading to Aberdeen. The A90 trunk road at Peterhead carries moderate traffic for a town this size, with a notably high HGV proportion due to port-related traffic. Department for Transport count data (DfT, 2025) shows an Annual Average Daily Traffic of roughly 7,000 – 10,000 vehicles per day near Peterhead Port, of which about 15% are HGVs, comprising fish lorries, supply base trucks, and other commercial traffic. The road network regularly accommodates HGV traffic related to fish processing and port freight activities. Local roads in Peterhead experience typical small-town traffic levels, with congestion tending to increase during shift changes at the port or nearby industries.

7.3.9 Public access to Smith Quay is restricted by a port security fence, so there is no public traffic on the quay itself. Overall, prior to construction, the existing traffic conditions involve an active network with periodic increases in volume from fishing related activity and consistent HGV movements associated with wider port operations.

7.4. Impact Assessment

7.4.1 During construction of the Smith Quay extension, the project will introduce temporary disturbances. These include noise from activities such as piling, dust emission, and construction traffic on local roads. The assessment below considers air quality and noise (as they affect the human environment), traffic and access, and overall socioeconomic aspects. Each potential impact is evaluated for significance, and mitigation measures embedded in the project plan are described. Impacts may be positive, negative, or neutral.

Socioeconomics

7.4.2 The presence of a construction site at the port could cause minor inconveniences (e.g. visual impact, perceived disturbance) but is not expected to negatively affect local businesses or tourism. There are no tourist attractions on-site to displace, and the nearest recreation (marina, holiday park) is across the bay, and will be able to operate normally throughout the construction period. Fishing vessels and other port users will be coordinated so that

construction does not impede their operations. PPA will maintain operations in parallel, meaning no loss of fishing or commercial activity is anticipated.

7.4.3 The project will support local investment and jobs; for example, workers will use local accommodation and services, while the improved quay will enhance Peterhead's economic capacity.

7.4.4 Overall, socioeconomic impacts are anticipated to be **Minor**; with the effect expected to be Neutral to Positive for the port and town. Post-construction, the quay extension is expected to generate positive economic benefits.

Air Quality

7.4.5 Construction activities such as concrete breaking, earthmoving, and vehicle operations are known sources of dust generation. Due to the site's coastal and open setting, there is potential for dust to be transported towards the town; however, most intensive activities are confined to the quayside, located at a distance of at least 180 m from sensitive receptors.

7.4.6 Embedded mitigation measures include the use of water sprays and stockpile covers for dust suppression, wheel washing for lorries, and prompt removal of mud from road surfaces. Furthermore, all construction machinery will be properly maintained to minimise exhaust emissions. Given the proximity of residential properties (~180 m), implementation of these best practices will assist in avoiding any noticeable decrease in air quality at property facades.

7.4.7 With these controls in place, residual dust and emission impacts are anticipated to be **Minor**, and local air quality is expected to remain within established standards. This conclusion aligns with the screening assessment, which predicted no significant effect on human health from air pollution.

Airborne Noise

Construction will involve activities like pile driving, rock breaking, and heavy vehicle operation, inevitably generating noise which will occur within an established industrial maritime setting. Of particular relevance to airborne noise is the chosen piling method: ODEX piling ("Overburden Drilling EXcentric"), which is a high-frequency percussive drilling technique. Instead of the classic loud 'bang' of impact hammering, ODEX uses a fast air-driven hammer (about 1235 blows per minute at 17 bar pressure) to advance a drill bit and casing through rock. This high strike rate effectively transforms the noise signature into a continuous, non-impulsive rattling sound, more akin to vibratory piling. In acoustic terms, much of the energy from ODEX piling is concentrated in the mid-frequency range (approx. 0.5–2 kHz), which tends to be readily absorbed in air over distance. Impact hammering will still be used briefly – each pile may receive a short burst (on the order of 1–2 minutes of low-power hammering) at the end of drilling to "seat" it – but these impulses are infrequent. Thus, for most of the ~23 weeks of piling activity, the airborne noise will be a steady drilling noise rather than loud hammer shocks. In terms of noise levels, ODEX piling typically generates noise levels in the range of

85–100 dB(A) at a distance of 15 m from the source, depending on the equipment used and ground conditions (Parker Environmental Consultants, n.d.).

7.4.8 Other noise sources include a hydraulic rock breaker (for fracturing any bedrock high spots during dredging) and a dredger/backhoe. The breaker (rated ~7,400 kg, 138 kW) can produce significant noise at its power pack and through the ground; however, if used underwater or at the toe of the quay, much of its acoustic energy will transmit into water or ground rather than air. The dredger will mostly create engine noise and the scraping of bucket on rock – audible, but comparable to or quieter than routine ship noise at the port. Finally, construction traffic (e.g. dump trucks, concrete mixers) on site will add engine revving and reversing alarms, mainly during daytime. These will be transient and localised within the port boundary.

7.4.9 BS 5228-1:2009 (Code of Practice for construction noise) gives an example threshold method ("ABC method") where, for a quiet area (baseline < 65 dB day), a construction noise level of 65 dB LAeq (12hr) might be the threshold of significance; in areas with higher ambient, thresholds of 70 or 75 dB can apply.

7.4.10 At 180 m distance, sound from heavy construction typically attenuates substantially. For example, a continuous drilling rig producing ~100 dB LAeq at 10 m would be expected to be of the order of 70–75 dB at 180 m (before any shielding) due to simple spherical spreading. In this case, some additional shielding occurs from intervening port structures.

7.4.11 This approach is consistent with standard UK construction noise criteria, where many local authorities set thresholds around 65–70 dB LAeq (daytime) for nearby residences. With ambient noise estimated at approximately 55 dB on a typical port day, the target is to maintain construction noise at no more than 5–10 dB above ambient levels, which BS5228 indicates corresponds to a minor impact. The works are temporary and scheduled during daytime hours; evening and nighttime activities are subject to lower noise limits of roughly 55 dB and 45 dB, respectively. Noisy operations such as piling and heavy breaking will be restricted to daylight or standard working hours to comply with local noise regulations and reduce disturbance.

7.4.12 A robust CEMP will detail noise control measures, following BS 5228:2009+A1:2014 (Code of Practice for noise/vibration on construction sites). Best Practicable Means will be employed, including:

- Using modern, well-maintained equipment with efficient mufflers and silencers.
- If necessary to meet required thresholds, erection of temporary acoustic screens or barriers around particularly noisy stationary plant (e.g. hydraulic power units or generators) to block line-of-sight to the nearest homes. Given the short 180 m separation, even a 2–3 m high barrier at the site boundary could yield a ~5–10 dB noise reduction for ground-level equipment.
- Scheduling and work-hour limits: High-noise tasks like piling will be timed to avoid early morning or late evening. No nighttime percussive work will occur. If overtime working is needed, quieter tasks (e.g. fitting rebar, formwork) will be done in the evening, with noisy machinery shut down.

7.4.13 With these measures in place, the residual airborne noise impact on the community is assessed as **Minor**.

Traffic and Access

7.4.14 Construction will result in an increase in temporary traffic from construction vehicles such as HGVs delivering steel piles, concrete, rock, and workers' vans. Where possible, deliveries may be made by sea directly to the port, using the existing quay—a strategy intended to reduce road congestion by unloading materials at the worksite via barge. Peak road traffic is expected during specific phases, including concrete pours or delivery of large equipment. The existing road network is able to accommodate these flows as port-related HGV traffic occurs regularly. On-site parking for workers will prevent any overflow onto public streets.

7.4.15 The significance of the impact on temporary road traffic is assessed as M**inor**. Upon completion, the quay is expected to improve transportation efficiency within the region by allowing larger vessels to berth at Peterhead rather than more distant ports, potentially reducing the number of long-haul truck journeys. This could lead to fewer HGV miles on regional roads over time, resulting in reduced fuel use and emissions.

7.5. Summary

7.5.1 Temporary impacts such as noise, dust, and increased traffic are anticipated during construction; however, these have been assessed as minor due to the integration of mitigation measures. The adoption of ODEX piling will result in continuous rather than impulsive noise, with activities scheduled to avoid early mornings and evenings. Measures including dust suppression, regular equipment maintenance, and comprehensive traffic management will be implemented to minimise disruption. The project is not expected to significantly affect sensitive receptors, and the socioeconomic impact is assessed as neutral to positive, offering potential benefits for local employment and enhanced port capacity. Upon completion, the quay extension is projected to improve regional transport efficiency and contribute to economic growth.

8. Schedule of Mitigation

8.1. Introduction

8.1.1 Mitigation measures which have been identified through the EA are collated within this section to form the Schedule of Mitigation for the Project.

8.2. Schedule of Mitigation

8.2.1 Table 8-1 collates all the mitigation measures discussed through this EA for the Project.

Table 8-1 Mitigation measures discussed in this EA report.

Topic	Mitigation/Enhancement	Guidance
Underwater and airborne Noise	Use of minimum energy required for percussive drilling, impulse piling (to seat pile after drilling) and Cardox.	

Topic	Mitigation/Enhancement	Guidance
Marine Mammals **Fish** **Marine Birds**	The impact piling marine mammal mitigation will provide the following measures: • A 500 m mitigation zone will be established around dredging, piling and rock-breaking (mechanical and Cardox) works. • For dredging, piling and mechanical rock breaking a MMO will also monitor in the direction of the harbour entrance (to distances noted in Table 5.10 of the EPS Risk Assessment (NIRAS, 2025e)) in order to minimise the risk of disturbance to EPS. Further detail of this mitigation is provided in the EPS Risk Assessment (NIRAS, 2025e) and CEMP. • Other marine megafauna, including basking shark, will be treated as per protocols for cetaceans. • If a seal (pinniped) is sighted within the mitigation zone following commencement of an activity the animal will be assumed to have entered the zone the works voluntarily and works do not need to pause.	Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010)
Marine Mammals **Fish** **Marine Birds**	For Cardox use, the following additional practices will be adopted: • Minimal charge size and number of charges to be used in all cases. • Sequential firing, rather than simultaneous firing.	JNCC guidelines for minimising the risk of injury to marine mammals from explosive use in the marine environment (JNCC, 2025)
Marine Mammals	All vessels to comply with the SMWWC.	Scottish Marine Wildlife Watching Code (NatureScot, 2017)
Benthic Ecology	The dredging will be carried out utilising positioning technology to ensure only the required dredge area is dredged and direct impacts on benthic habitats outside the footprint area are avoided, and remote effects minimised.	
Air Quality	Dust suppression (water sprays, covers), emission-controlled equipment.	

Topic	Mitigation/Enhancement	Guidance
Airborne noise	Using modern, well-maintained equipment with efficient mufflers and silencers. If required, erecting temporary acoustic screens or barriers around particularly noisy stationary plant (e.g. hydraulic power units or generators) to block line-of-sight to the nearest homes. Scheduling and work-hour limits: High-noise tasks like impact piling or rock breaking will be timed to avoid early morning or late evening. No nighttime percussive work will occur. If over-time working is needed, quieter tasks (e.g. fitting rebar, formwork) will be done in the evening, with noisy machinery shut down.	BS 5228-1:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites –Part 1: Noise (The British Standards Institution, 2014)
Traffic and access	Use port for deliveries by sea to ease roads where possible. On-site parking for workers to prevent any overflow onto public streets.	

8.3. Mitigation Implementation

Construction Mitigation

8.3.1 A CEMP will be drafted based on the mitigations detailed in Table 8-1. The CEMP will be a working document utilised by the construction contractor during both the construction planning and implementation phases. The CEMP will inform the production of the construction contractor Risk Assessment Method Statements for the works.

8.3.2 Appropriate resources will be put in place to ensure the CEMP requirements can be met.

Operational Mitigation

8.3.1 There are no operation mitigations measures in this EA as the operation of the quay will return to regular levels. All mitigations should be covered in existing and updated Standard Operating Procedures.

9. Conclusions

9.1.1 This report has been prepared to assist the Marine Directorate in its decision-making process regarding the sustainable development of the Marine Environment and undertaken in accordance with the requirements of a Marine Licence and Marine Works Regulations (Scotland) 2017 to determine the impact of the proposed works on nearby features, with an

emphasis on marine mammals, benthic habitats, marine ornithology, and public bathing waters.

9.1.2 Marine mammals and fish were assessed in this EA for impacts associated with construction works such as underwater noise and collision with vessels. The largest impact area was on VHF cetaceans with regards piling, although though all cetacean groups and pinnipeds would be exposed to a small risk of noise impacts from dredging and piling activities prior to mitigation. Impacts to marine mammals will be minimised to safe levels through a 500 m mitigation zone to be monitored by a marine mammal observer. Surveillance of the harbour entrance area will also be undertaken to minimise risk of disturbance effects.

9.1.3 The potential environmental effects of the Project on the benthic ecology were assessed in this report. The benthic habitat receptors within the proposed development area were identified. Potential impacts were identified but assessed to be non-significant. This was due to the localised impact, the quality and value of the receptors, as well as the implementation of existing mitigation measures during the construction operation of the development.

9.1.4 Marine ornithology was assessed in this EA for pressures such as physical disturbance and water quality. The impact significance from these pressures was deemed minor and non-significant.

9.1.5 The potential impact to water quality of the bathing waters of Peterhead Lido was assessed within this report. The impact from construction activities was deemed to be negligible to minor and non-significant.

9.1.6 Best practise measures within the CEMP will be implemented to ensure all potential impacts to receptors are minimal.

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