REPORT

Leith Outer Berth

Environmental Screening Report

Client: Forth Ports Limited

Reference: PC2045-ZZ-XX-RP-Z-0001
Status: S0/P01.05
Date: 04 November 2021

FORTH PORTS SCOTLAND

Royal HaskoningDHV
Enhancing Society Together

HASKONINGDHV UK LTD.

Stratus House
Emperor Way
Exeter
EX1 3QS
Industry & Buildings
VAT registration number: 792428892

+44 1392 447999 **T**
+44 1392 446148 **F**
info.exeter@uk.rhdhv.com **E**
royalhaskoningdhv.com **W**

Document title:	Leith Outer Berth
Document short title:	EIA Screening Report
Reference:	PC2045-ZZ-XX-RP-Z-0001
Status:	P01.05/S0
Date:	04 November 2021
Project name:	Leith Berth
Project number:	PC2045
Author(s):	Sarah Marjoram, Gemma Starmore
Drafted by:	Sarah Marjoram, Gemma Starmore, David Brew, Victoria Cooper, Helen Riley, Sebastian Chesney, Kari Dennis, Alun McIntyre
Checked by:	Gemma Starmore
Date:	03/11/2021
Approved by:	Jamie Gardiner
Date:	04/11/2021

Classification
Project related

Table of Contents

Table of Tables

Table of Figures

Acronyms

Acronym	Acronym description
AEoI	Adverse Effect on site Integrity
AL	Action Level
APR	Annual Progress Report
AQMA	Air Quality Management Area
BPM	Best Practice Measures
CD	Chart datum
CEC	City of Edinburgh Council
CI	Confidence Interval
COSHH	Control of Substances Hazardous to Health
cSAC	Candidate Special Areas of Conservation
DAERA	Department of Agriculture, Environment and Rural Affairs
DBA	Desk Based Assessment
EC	European Commission
EDG	Edinburgh Design Guidance
EIA	Environmental Impact Assessment
EU	European Union
GHG	Greenhouse gas
GPP	Guidance for Pollution Prevention
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicles
HPA	Historic Marine Protected Areas
HRA	Habitats Regulations Appraisal
IAQM	Institute of Air Quality Management

IROPI	Imperative reasons of overriding public interest
LCT	Landscape Character Type
LDV	light-duty road vehicle
LOA	Length Overall
LPAs	Local Planning Authorities
LSE	Likely Significant Effect
LVIA	Landscape and Visual Impact Assessment
MCA	Maritime and Coastguard Agency
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MPA	Marine Protected Area
MS	Marine Scotland
NIEA	Northern Ireland Environment Agency
NRHE	National Record of the Historic Environment
NRW	Natural Resource Wales
NSN	National Site Network
OUV	Outstanding Universal Value
OWF	Offshore Wind Farm
PPE	Personal Protective Equipment
SNH	Scottish Natural Heritage
SAC	Special Areas of Conservation
SEPA	Scottish Environmental Protection Agency
SPA	Special Protection Area
SPMTs	Self-Propelled Modular Transporters
SSSI	Site of Special Scientific Interest

SWMP	Site Waste Management Plan
VTS	Vessel Traffic Service
WeBS	Wetland Bird Survey
WHS	World Heritage Site
WTGs	wind turbine generator
ZTV	Zone of Theoretical Visibility

Executive Summary

This report has been issued to the City of Edinburgh Council (CEC) and Marine Scotland in support of a request for Screening Opinions under The Town and Country Planning (Environmental Impact Assessment (EIA)) (Scotland) Regulations 2017 (as amended) and the Marine Works (EIA) (Scotland) Regulations 2017 (as amended), respectively (the EIA Regulations). This report presents the findings of an EIA screening exercise, to determine the requirement for EIA under the EIA Regulations.

Offshore wind is a key growth sector in Scotland, and the generation and development of offshore wind infrastructure is a key component for reaching Scotland's target to reduce greenhouse gas emissions (by 75% by 2030), and for being net-zero by 2045. Part of the next round of offshore wind development in Scotland (currently being bid for through the ScotWind process) is to ensure that 25% of the offshore wind industry is provided by local business.

The Port of Leith is ideally situated to support the offshore renewables industry, due to its central location for projects within the northern North Sea. Currently, vessels of more than 30m in width are unable to transit through the lock gates into the inner Port of Leith. Forth Ports Limited is therefore proposing to improve a berth located outside of the lock gates to be used primarily by the offshore renewables industry, and to re-configure a section of port land (of 15 hectares) to provide laydown and storage areas for the components associated with, e.g., offshore windfarms (such as nacelles, towers, blades, and foundations).

The proposed development is considered to be a Schedule 2 EIA development, falling under Schedule 2 10(g) of the EIA Regulations, as:

> *Construction of harbours and port installations, including fishing harbours (unless included in schedule 1)*

The potential impacts of the Proposed Development have therefore been assessed in accordance with the criteria set out in Schedule 3 of the EIA Regulations, and are concluded as follows:

- The proposed development would have a significant beneficial impact on the local and regional socio-economy, through the provision of significant numbers of well-paid permanent jobs and career opportunities, as well as indirect and induced employment opportunities.
- Beneficial impacts on the surrounding environment have been identified as a result of the proposed decommissioning of the existing Shawcor facility, which is a current source of air and noise emissions, as well as having a negative visual appearance, when compared to the proposed development. The use of the area as a laydown for the offshore renewables industry, would comprise a uniform stone surface and utilise more quiet modern equipment.
- Potential impacts to ornithology, marine mammals and fish during construction would be managed effectively using current best practice construction methodology and industry standard mitigation measures. No other potentially significant impacts have been identified during construction.
- No significant impacts are expected during operation of the proposed development from noise or emissions to air. In addition, the provision of cutting-edge technology, such as shore power, would reduce the need for vessels to be 'idling' at the berth with engines running while transhipments are taking place, therefore reducing noise and emissions to air.
- The tallest components that would be stored on the laydown area would be towers associated with offshore wind farms; however, their presence would be short term, with full assembly taking place immediately prior to being collected and taken offshore to the wind farm development site. Given their narrow cylindrical form, they would quickly become indistinguishable at any distance from the

Port of Leith. As such, there would be no significant impact to the local landscape character and visual setting during operation.

- The Port of Leith already accepts vessels of a similar size to those that support the offshore renewables industry, in terms of length and height, it is just the wider beam width that prevents these vessels from being able to access the lock. As such, the ability for the Port of Leith to accept these vessels is not considered to represent a change to the existing situation.

Given the beneficial impacts that have been identified and the limited potential for the proposed development to result in significant environmental impacts, which can be managed using best practice construction methodology and industry standard mitigation measures, it has been concluded by Forth Ports Limited and their advisors that **the Proposed Development does not require an EIA** under the Marine Works (EIA) (Scotland) Regulations 2017 (as amended) or The Town and Country Planning (EIA) (Scotland) Regulations 2017 (as amended).

1 Introduction

1.1 Background

Offshore wind is a key growth industry for Scotland, and a key component for reaching Scotland's target to reduce greenhouse gas emissions by 75% by 2030 and being net-zero by 2045[1]. The ScotWind process will mean more wind farm projects in the future, and a part of that process includes the commitment to at least 25% of the Offshore Wind Farm (OWF) industry being local[2]. To be able to achieve this, additional suitable port capacity is required in Scotland. To date, there has been limited local content in relation to the currently installed / being installed capacity. An increase in suitable port capacity will facilitate increased local content. Given the proximity of the Port of Leith to either consented or planned developments, it has been identified that Leith should be a strategic element for the offshore wind supply chain in the future.

The lock gates at the Port of Leith currently restrict access for vessels with a beam (width) of over 30m. Forth Ports Limited is therefore proposing to improve the berth seaward of the entrance to lock; to support vessels associated with the offshore renewables industry (see **Figure 1-1**) which cannot currently transit the lock entrance.

The proposed development would provide:

- Improvements to a 120m section of existing berth (Area 1 as shown on **Figure 1-1**);
- An area of hardstanding to be used for loading/unloading (Area 2 as shown on **Figure 1-1**);
- Space for a reconfigured laydown area within the existing port to be used for the storage and transhipment of cargo, most likely offshore wind farm (OWF) components (such as the blades, towers and nacelles) (Area 3 as shown on **Figure 1-1**); and,
- Enlarge the existing berth pocket (Area 4 as shown on **Figure 1-1**).

1.2 Purpose of this Report

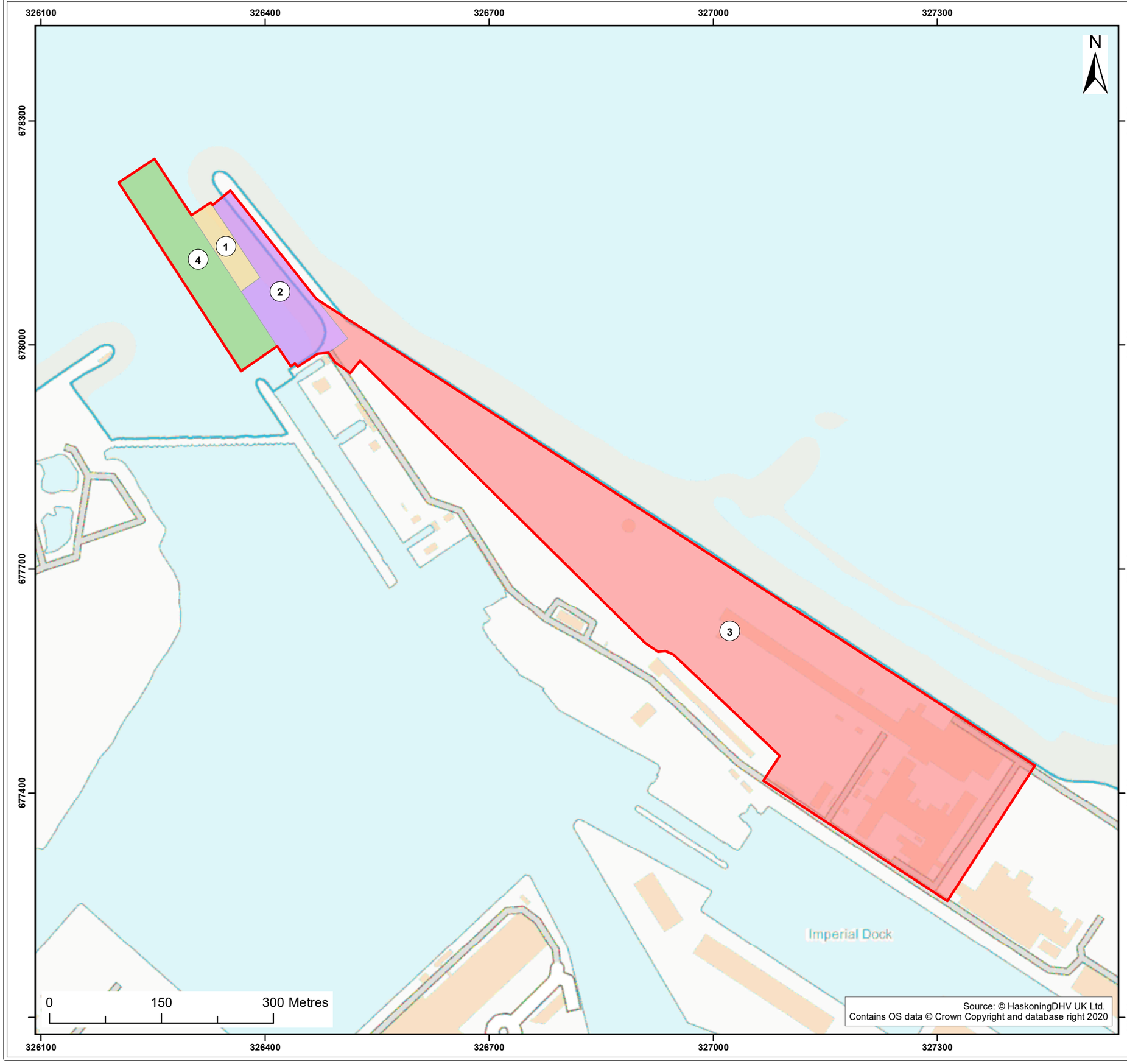
This report has been submitted to Marine Scotland (MS) and City of Edinburgh Council (CEC) along with a request for Screening Opinions in accordance with the Marine Works (Environmental Impact Assessment (EIA)) (Scotland) Regulations 2017 (as amended[3]) and the Town and Country Planning (EIA) (Scotland) Regulations 2017 (as amended[4]).

1.3 Structure of this Report

This Screening Report is structured as follows:

- **Section 2** provides a review of the legislation relevant to the screening for EIA;
- **Section 3** provides an outline description of the proposed development;
- **Section 4** provides a description of the potential environmental impacts arising from the proposed development and whether these are deemed to be significant; and,
- **Section 5** presents the conclusions of the screening exercise.

[1] https://www.gov.scot/policies/climate-change/reducing-emissions/
[2] https://www.crownestatescotland.com/resources/documents/supply-chain-development-statement-summary-1
[3] *The Marine Environment (EU Exit) (Scotland) (Amendment) Regulations 2019*
[4] *The Town and Country Planning and Electricity Works (Miscellaneous Amendments) (EU Exit) (Scotland) Regulations 2019*



Legend:

- Red line boundary
- 1 - Quayside and mooring dolphin
- 2 - Existing jetty, and backland infill / hardstanding area
- 3 - Laydown area for OWF support
- 4 - Dredging works

Client: Port of Leith	Project: Leith Outer Berth

Title: Location Plan

Figure: 1	Drawing No: PC2045-RHD-ZZ-ZZ-DR-EV-0004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	05/07/2021	JT	GS	A3	1:5,000
02	14/05/2021	JT	GS	A3	1:5,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV
INDUSTRY & BUILDINGS
2 ABBEY GARDENS
GREAT COLLEGE STREET
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoningdhv.com

2 Enabling and EIA Legislation

2.1 Enabling legislation

2.1.1 Town and Country Planning (Scotland) Act 1997

The Town and Country Planning (Scotland) Act 1997 regulates the development of land in Scotland and provides Local Planning Authorities (LPAs) the power to approve planning proposals, preserve buildings of architectural or historical interest (Listed Buildings) and redevelop land, amongst others. The Town and Country Planning (Scotland) Act 1997 extends to the Mean Low Water Springs (MLWS). The CEC is the LPA.

2.1.1.1 The Town and Country Planning (General Permitted Development) (Scotland) Order 1992

The Town and Country Planning (General Permitted Development) (Scotland) Order 1992, as amended[5], grants planning permission for classes of specific types of developments.

2.1.2 Marine Scotland Act 2010

Part 4 of the Marine Scotland Act 2010 provides a framework for the marine licensing system for those 'licensable marine activities' undertaken within Scottish waters below Mean High Water Springs (MHWS). Marine Scotland is the regulatory authority for marine licensing in Scottish inshore and offshore waters.

2.2 EIA Legislation

The following regulations apply:

1. Marine Works (EIA) (Scotland) Regulations 2017 (as amended) (the MWRs); and,
2. The Town and Country Planning (EIA) (Scotland) Regulations 2017 (as amended) (TCPRs).

For the purposes of this Report, these regulations are termed the 'EIA Regulations'. The EIA Regulations contain two Schedules that identify projects that are considered EIA development and whether an EIA is mandatory or whether this is dependent upon set thresholds and criteria, as follows:

- Schedule 1: development of this type requires that an EIA is undertaken; and,
- Schedule 2: development of this type ***may*** require that an EIA is undertaken depending on the scale of the development, its characteristics and the sensitivity of the environment in which the development will take place.

It has been concluded that the proposed development is not a Schedule 1 Development under the EIA Regulations, and falls under Schedule 2. The reasons for this are outlined in more detail as follows.

Paragraph 8 of Schedule 1 of the EIA Regulations states:

> *(1) Inland waterways and ports for inland-waterway traffic which permit the passage of vessels of over 1,350 tonnes.*
> *(2) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes.*

[5] *As amended in 2014 and 2017*

Paragraph 21 of the MRWs and Paragraph 24 of the TCPRs of Schedule 1 states:

> *Any change to or extension of projects listed in this schedule where such a change or extension in itself meets the thresholds, if any, or description of projects set out in this schedule.*

Paragraphs 21 and 24 of the MRWs and TCPRs respectively, as outlined above, are to be read in conjunction with paragraphs 8(1) and 8(2). The proposed development does not fall under paragraphs 8(1) and 8(2) of schedule 1; 8(1) does not apply as the development is not for an "inland waterway" or a "port for inland waterway traffic", and 8(2) is aimed at the provision of new "ports" or "piers" with potential to take large vessels. That is not the case with regard to the proposed development at the Port of Leith. The reference to piers (paragraph 8(2)) is not relevant as it refers to piers outside of, i.e. not part of, an existing port. The proposed development is wholly within Forth Ports' existing harbour area. It is also within the confines of the existing Port of Leith, both operationally and from a land ownership perspective. The proposed works at the Port of Leith are concerned with the alteration or improvement of existing infrastructure at a port, which already provides for vessels of over 1,350 tonnes. The works are not to form a new port which can take vessels of over 1,350 tonnes, or to increase the capacity of a port such that in future it can take vessels of over 1,350 tonnes. As such, paragraphs 21 and 24 of the MRWs and TCPRs respectively are not considered relevant as these relate only to changes or extensions to the type of projects listed in schedule 1 which itself does not apply to the proposed works.

The proposed development is however considered to be a Schedule 2 development, falling under Schedule 2 10(g) of the EIA Regulations as:

> *construction of harbours Construction of harbours and port installations, including fishing harbours (unless included in schedule 1)*

Schedule 3 of the EIA Regulations sets out the criteria that should be considered for deciding whether a project should be screened as EIA development (see BOX 1).

Box 1: Schedule 3 of the MWRs

Characteristics of works

1. The characteristics of works must be considered having regard, in particular, to—
    a. the size and design of the works;
    b. cumulation with other existing works and/or approved works;
    c. the use of natural resources, in particular land, soil, water and biodiversity;
    d. the production of waste;
    e. pollution and nuisances;
    f. the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge;
    g. the risks to human health (for example due to water contamination or air pollution).

Location of works

2. The environmental sensitivity of geographical areas likely to be affected by works must be considered having regard, in particular, to—
    a. the existing and approved land use;
    b. the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground;
    c. the absorption capacity of the natural environment, paying particular attention to the following areas—
        i. wetlands, riparian areas, river mouths;

Box 1: Schedule 3 of the MWRs

ii. coastal zones and the marine environment;
iii. mountain and forest areas;
iv. nature reserves and parks;
v. European sites and other areas classified or protected under national legislation;
vi. areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure;
vii. densely populated areas;
viii. landscapes and sites of historical, cultural or archaeological significance.

Characteristics of the potential impact

3. The likely significant effects of the works on the environment must be considered in relation to criteria set out in paragraphs 1 and 2 above, with regard to the impact of the works on the factors specified in regulation 5(3), taking into account—
    a. the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
    b. the nature of the impact;
    c. the transboundary nature of the impact;
    d. the intensity and complexity of the impact;
    e. the probability of the impact;
    f. the expected onset, duration, frequency and reversibility of the impact;
    g. the cumulation of the impact with the impact of other existing and/or approved works;
    h. the possibility of effectively reducing the impact.

Taking these criteria into account, screening Opinions are sought from Marine Scotland under the MWRs and the CEC under the TCPRs. In accordance with Schedule 3 of the EIA Regulations, this request comprises the following information:

- A chart or map (or both) sufficient to identify the location of the project and of the regulated activity (**Section 3**).
- A description of the project, including in particular:
    - a description of the physical characteristics of the whole project and, where relevant, of demolition works (**Section 3**); and,
    - a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected (**Section 4**).
- A description of the aspects of the environment likely to be affected by the project (**Section 4**).
- A description of any likely significant effects of the project on the environment (**Section 4**), to the extent of the information available on such effects resulting from:
    - The expected residues and emissions and the production of waste, where relevant; and,
    - The use of natural resources, in particular soil, land, water and biodiversity.
- Such further information or representations as the applicant may wish to provide or make, including a description of any features of the project or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment (**Section 4**).

3 Description of the Proposed Development

The proposed development would include (see also **Figure 1-1**):

- Improve a 120m section of existing berth (Area 1);
- An area of hardstanding to be used for loading/unloading (Area 2);
- A laydown area for the storage and transhipment of components for the offshore renewables industry (Area 3); and,
- Capital dredging to enlarge the existing berth pocket (Area 4).

It is envisaged that the majority of earthworks materials, steel tubular piles, steel sheet piles, fenders and bollards required for the construction would be delivered to site by sea.

3.1 Construction Phase

3.1.1 Outer berth

Improvements to the berth seaward of the existing concrete lead-in jetty would be constructed as a suspended deck, approximately 120m long, 30m in width, with a 10m run off apron landside. The existing steel piled jetty currently at this location would be removed by vibro-extraction of the piles if possible or by cutting of the piles at bed level. The improved berth would be located to the northern end of the inner edge of the East Breakwater (shown as Area 1 on **Figure 1-1**).

The improved berth would be constructed using tubular piles, between approximately 1.3m and 1.4m in diameter, with a combi-wall at the rear, constructed using a combination of steel tubular piles (approximately 1.5m in diameter) and infill sheet piles. Mooring dolphins would be installed with piles of approximately 1.3m diameter. It is anticipated that, in total, approximately 150 piles and 44 sheet piles would be required; however, as the design evolves this may change. The installation method of the piles will be confirmed once the design has been fully developed, and could include impacting piling as well as other methods, such as drilling and socketing. Vibro-piling will be used as much as possible. The foundations and screen wall are expected to be above MHWS. An indicative cross section of the proposed improved berth can be seen in **Figure 3-1**, and a plan of Areas 1 and 2 shown on **Figure 3-2**.

The existing jetty in Area 2 (**Figure 1-1**) is formed of large concrete abutments. This structure would be retained. The area to the rear of this structure will be developed to form additional rear-of-quay hardstanding. The final design for this area is still being developed. It is expected that surfaces will be stone finished throughout.

Rock armour would be used to protect all revetment slopes where these interface the water (**Figure 3-2**). These revetments will be located under the improved quay (along the north-western side of the eastern breakwater), and at the rear of the lead in jetty, effectively replacing the existing concrete blocks which provide wave dissipation at the lock entrance. The rock armour is expected to be 1 to 2 tonne, 1.6m thick over an underlayer of 60 to 300kg, and 0.8m thick. Anticipated quantities of each are 5,500m^3 of rock armour and 3,300m^3 of underlayer rock, subject to completion of the design.

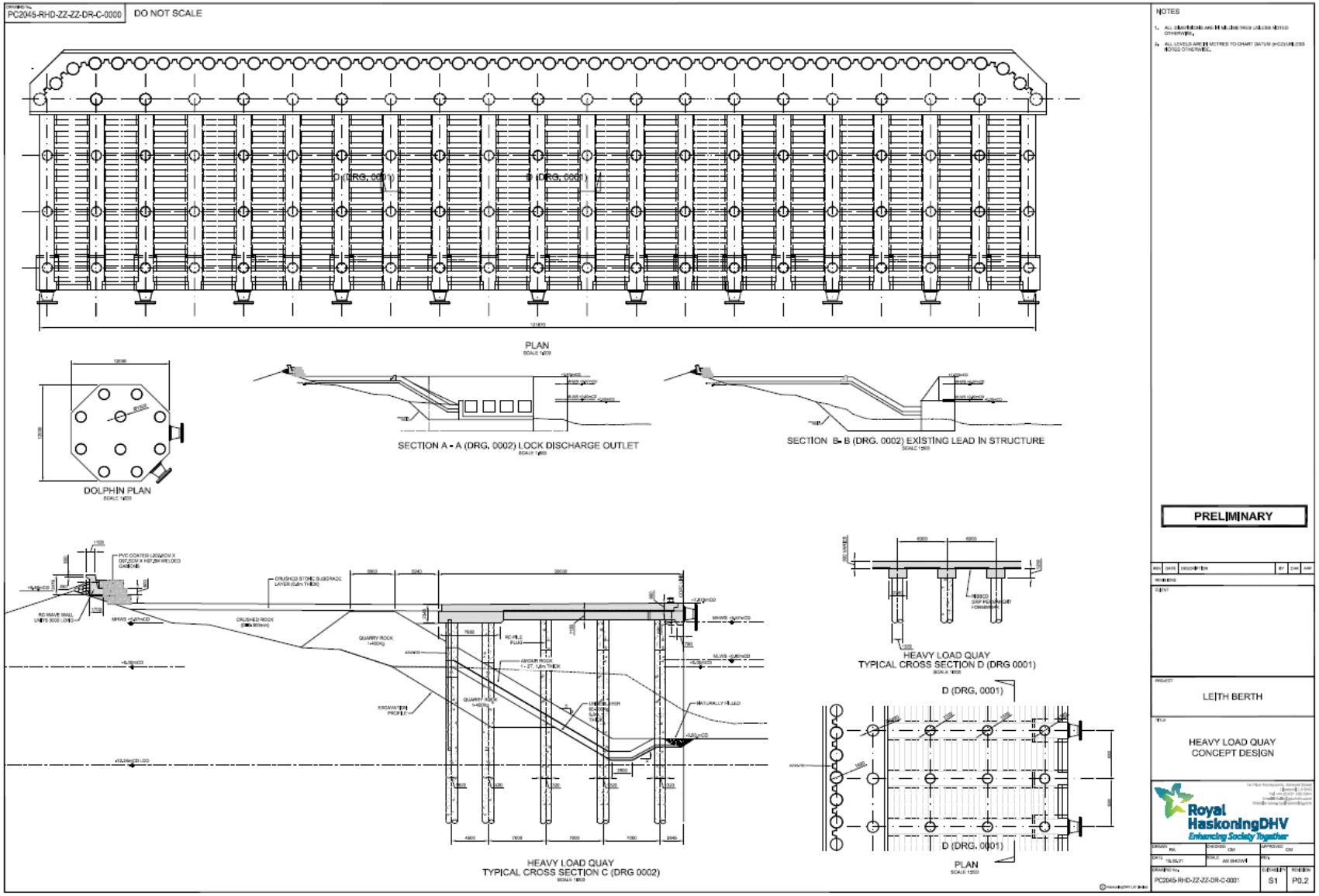


Figure 3-1 Leith Outer Berth Cross Sections

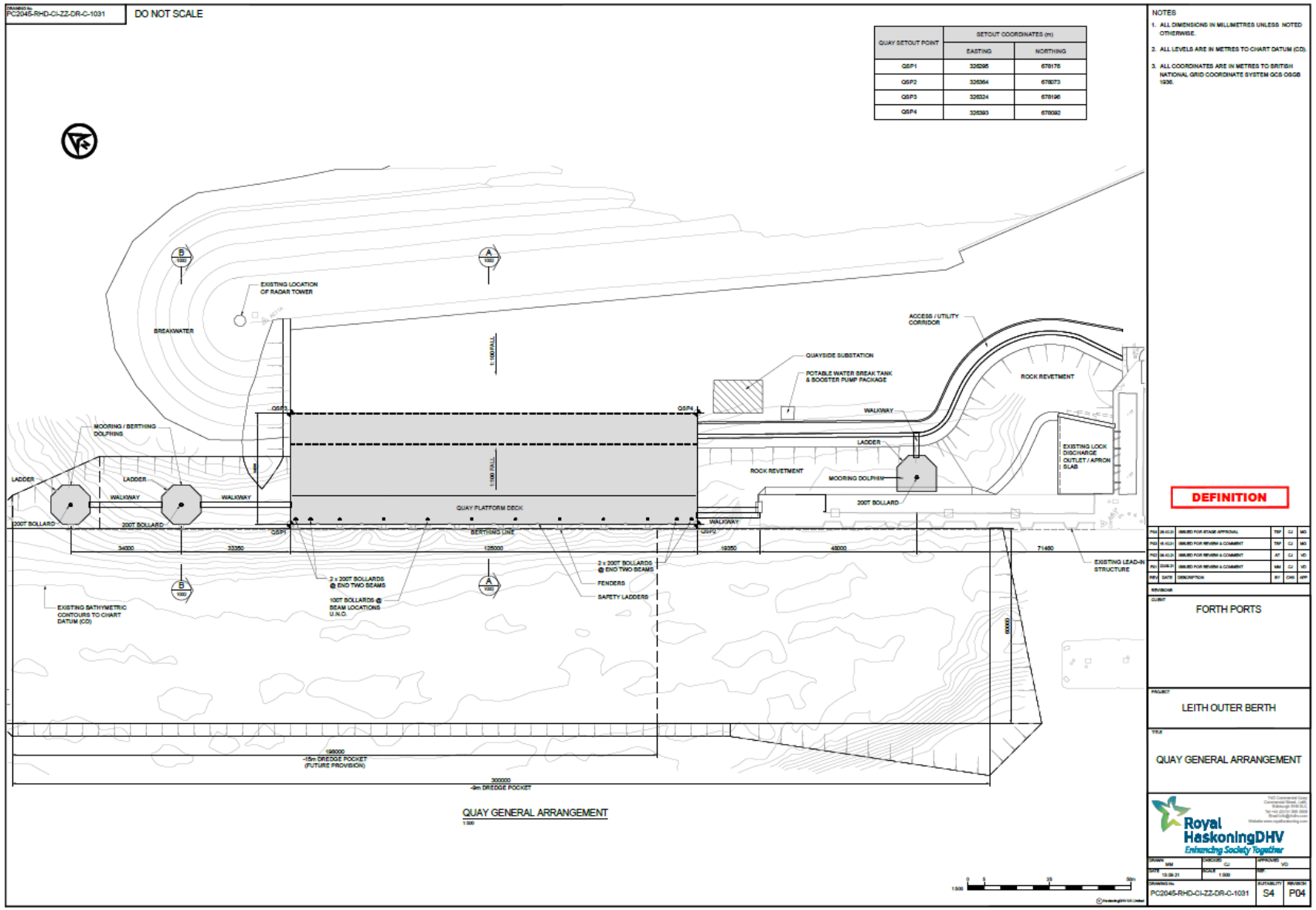


Figure 3-2 Indicative plan of Leith Outer Berth

3.1.2 Laydown area

The proposed laydown area (Area 3 on **Figure 1-1**) is currently used as a pipe coating and storage yard. This area would be cleared, with the existing buildings and infrastructure removed. Thereafter it is expected that a stone hardstanding surface would be provided. Drainage infrastructure and lighting would be installed. New storm water drainage outfalls would be installed to discharge surface water run-off. Surface water would be discharged into the sea following suitable treatment, as per the current situation.

3.1.3 Berth pocket

The existing berth pocket (Area 4 in **Figure 1-1**) would be modified by dredging to between -9 and -10m CD (-9.25 and -10.25m CD including a 0.25m over dredge allowance), and be approximately 300m by 60m wide. Total dredge volume is estimated to be approximately 100,000m^3. Much of this area is already part of a dredge pocket and the Leith approach channel. It is anticipated that the excavated material would either be used in the reclamation, where possible, or be disposed offshore.

3.1.4 Outline construction programme

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:

- Removal of existing dolphins and jetty, and excavation of existing revetment materials (four months).
- Dredging to modify the existing berth pocket (up to four months).
- Piling works for the improved quay (four months).
- Placement of foundations and wave screenwall units at rear of Area 2 (two months).
- Installation of rock armour (one month).
- Placement of pilecaps, beams and deck panels onto piles to form the new quay deck, and installation of fenders and fixings (five months).
- Piling works for new dolphins (one month).
- Installation of pilecaps, beams, deck, bollards, and walkways for new dolphins (four months).
- Earthworks at the hard standing area (six months)
- Drainage systems, lighting and services (one month).
- Placement of surface layers to hardstanding areas (one month).

The overall construction programme is anticipated to be 15 months, with an anticipated start date of mid-2022.

3.2 Operational Phase

3.2.1 Outer berth

The primary use of the improved outer berth would be for use within the offshore renewables industry, providing facilities for the transhipment and storage of components such as all wind turbine generator (WTGs) parts associated with a wind farm project (including the blades, towers and nacelles) as well as foundations (such as pin piles, jackets and floating foundations). The berth could also be used for other tidal energy projects and the decommissioning of redundant oil and gas structures where vessels cannot transit the existing lock entrance.

Offshore renewable energy components would be delivered to the Port of Leith from various locations across the UK, Europe, and other international locations. Loading/unloading, using mobile cranes, is expected to

take up to 24 hours; whilst a vessel is berthed, the entrance to the Port of Leith would be restricted. It is therefore in the interest of the port to ensure the proposed outer berth is occupied for the minimum time possible. Overall lock and berth utilisation would be controlled by the Port, as is the case today.

As with the port currently, the outer berth could be operational 24 hours a day, seven days a week, and be available for use by the Port's customers as required; however, use by the offshore renewables industry, i.e. those vessels which cannot transit the lock gates due to the beam restrictions, is expected to be relatively infrequent as these vessels would only use the facility during the construction phase of an offshore renewable project. For illustrative purposes, an offshore wind farm comprising the installation of 100 turbines to pre-installed foundations would be expected to require 25 round trips of the installation vessel from the port to the project site over a period of six to 12 months, i.e., on average, 2.1 to 4.2 times per month. The port can and does accept vessels of a similar size to those that associated with the offshore renewables industry, in terms of length and height, it is just the wider beam that prevents some vessels from being able to access the lock (see **Plate 3-1**).

The number of vessels currently using the port is, on average, 1,150 per year. Given this, and the fact that vessels would no longer access the port for the decommissioned Shawcor facility, the overall change in vessel numbers using the port would not likely be significant. The provision of shore power would reduce the need for vessels to be 'idling' at the berth with engines running, therefore reducing noise and emissions to air.

3.2.2 Laydown area

The use of the proposed lay down area is similar to its current use, which is to store large oil and gas pipes (see **Plate 3-1**). Once completed, it is expected that the laydown area would be formed of a stone hardstanding surface, allowing for drainage into collector drains, which, following suitable treatment, would be discharged into the sea, as per the current situation. Lighting would be provided as required, comprised of downward orientated luminaires, with minimal light spill, and to the appropriate level necessary to meet operational health and safety requirements.

The type of components that may be stored within the laydown area include those that are required for offshore wind farms (such as foundations, towers, nacelles, blades, tidal turbines) as well as other components related to the offshore renewable industry.

Plates 3-2 to **3-4** provide an impression or indication of how the proposed development would look.

Plate 3-1 Current use of the Port and storage area

Plate 3-2 Proposed development once constructed

Plate 3-3 Example use of the outer berth and laydown area

Plate 3-4 Example loading of offshore renewables vessel when berthed

4 Description of Potential Environmental Impacts

4.1 Introduction

This section provides an overview of the potential impacts that could arise as a result of the proposed development during the construction and operational phases, and, where applicable, describes measures that have been identified to avoid or mitigate these impacts.

In addition to the measures set out in the following sections to avoid or mitigate any adverse effects that could arise as a result of the proposed development, industry good practice guidance will be adhered to throughout the programme of works, such as:

- Scottish Environmental Protection Agency (SEPA) guidelines, in particular Guidance for Pollution Prevention (GPP) 5 – works in, near or liable to affect watercourses (NIEA, DAERA, SEPA and NRW, 2018); and,
- CIRIA Coastal and Marine Environmental Site Guide (second edition) (CIRIA report C744).

4.2 Coastal Processes

4.2.1 Existing environment

Waves and tidal currents

The predominant wave approach on this coast is from the east to east-northeast sector (from the North Sea). These waves drive longshore sediment transport to the west at the proposed development. Tidal streams run approximately parallel to the coast and are east-northeast to west-northwest (into the estuary) during the flood tide and west-northwest to east-northeast (out of the estuary) during the ebb tide (British Geological Survey, 1986). Currents are relatively strong in mid-channel (enough to transport and erode fine sediment), but are weaker in the nearshore zone close to the proposed development.

Bedload sediment transport

Sediment transport at and adjacent to the proposed development is relatively benign with a weak net longshore bedload transport direction to the west. Sand has accreted along the outer face of the existing port breakwater, since it was constructed, but limited deposition of bedload in the approach channel suggests that there is little flux of sediment in a westerly direction across the port entrance (Sinclair Knight Merz, 2012). There is likely to be limited nearshore tidally-driven transport of suspended sediments.

Suspended sediment concentrations and deposition

Ambient suspended sediment concentrations in the vicinity of the proposed development are less than 5mg/l (Jacobs Arup, 2009). However, suspended sediments do become trapped within a large eddy in the lee of the breakwater and settle at slack water into the approach channel (ERM, 2021). The main sediment accumulation occurs over approximately the inner 200m of the approach channel and maintenance dredging is required to maintain safe navigation in the channel.

4.2.2 Potential impacts

4.2.2.1 During construction

Construction impacts include:

- Short term increases in suspended sediment concentrations during capital dredging of the berthing pocket and land-claim (infilling) activities to create the new hardstanding area. Given the relatively small quantity of fine estuary bed sediment released (a total dredge volume of up to approximately

100,000m^3), the disturbance would cause only minor and temporary increases in suspended sediment concentrations.

- Changes in sea-bed level due to deposition of the sediment suspended due to dredging activities. Any sediment that becomes entrained within the plume will have the potential to become deposited on the estuary bed as it settles through the water column. The depositional effects are likely to remain within the bounds of natural processes, with construction effects being one-off and temporary in duration (and unlikely to be measurable after a period of time through deposition and resuspension).

The potential impacts of construction on suspended sediment concentrations and changes in sea-bed level are therefore not considered to be significant.

4.2.2.2 During operation

Potential effects during operation could occur due to the berth improvements and enlarged berth pocket, which may result in changes to waves and tidal currents. These changes could potentially affect the sediment transport mechanisms and/or sea bed morphology; however, the geometry of the breakwater on its estuary side will not change and so there would be no changes to waves and tidal currents approaching it and flowing along it. Given the absence of local effects, the regional waves and tidal currents would also not change from their baseline conditions. The length of the breakwater is not going to increase and hence there will be no effects to longshore sediment transport along its seaward face. The enlarged berth pocket may create a small additional sink for suspended sediment.

As the amount of sediment transported both as bedload and in suspension is small, the anticipated effects of the proposed development on the natural physical environment and sediment transport system are considered to be insignificant.

4.2.3 Summary

Overall, potential impacts from changes to coastal processes are not considered to be significant.

4.3 Marine Water and Sediment Quality

4.3.1 Existing environment

4.3.1.1 Water quality

Water quality is managed through the Water Environment and Water Services (Scotland) Act 2003 (the WEWS Act) (as amended[6]) which transcribes the Water Framework Directive (2000/60/EC) into Scottish law. The proposed development is within the Kinghorn to Leith Docks coastal water body (ID: 200041) which has an overall status of Good, a chemical status of Pass and an ecological status of Good[7]. The neighbouring coastal water body to the east of the proposed development is the Leith Docks to Port Seton coastal water body (ID: 200034) which is classified as a heavily modified water body. It has an overall status of Poor due to the modifications to the bed, banks and shores. The reason for not meeting the 2021 target of Good status is the mitigation measures are not technically feasible.

The upstream water body is the Water of Leith (Murray Burn confluence to Estuary) (ID: 3700) which is designated as a heavily modified water body on account of physical alterations to the water body. The current overall status of this water body is Poor as a result of poor access for fish migration. Physical processes and water quality are also classified as Poor due to water flows and levels, and point source

[6] *The Environment (EU Exit) (Scotland) (Amendment etc.) Regulations 2019*
[7] *https://www.sepa.org.uk/data-visualisation/water-environment-hub/*

discharges, respectively. Actions to remedy these classifications are ongoing and target status by 2027 is Good.

Water quality is also monitored at Bathing Waters designated through the Bathing Water Directive (2006/7/EC) enacted in Scotland by the Bathing Waters (Scotland) Regulations 2008 (as amended[3]). The closest Bathing Waters are Portobello (West) and Portobello (Central) approximately 5km and 7km, respectively, to the east of the proposed development. Portobello (West) has a current classification of Sufficient and Portobello (Central) is classified as Good[8].

There are no Shellfish Waters within the Firth of Forth under The Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2013.

4.3.1.2 Sediment quality

Sediment sampling will be undertaken in Area 4 (**Figure 1**) prior to the dredging works, to measure any contaminant presence against MS Action Levels.

4.3.2 Potential impacts

4.3.2.1 During construction

Potential impacts to marine and sediment water quality during construction include:

- Potential release of historic contamination in sediments during dredging;
- Surface water run-off from land-based construction activities; and,
- Accidental spills or leaks from construction plant or vessels.

The capital dredge would deepen the existing berth pocket to between -9mCD and -10mCD, therefore sediment samples will be obtained to characterise the sediment particle size and any contamination present. A sample plan has been submitted to Marine Scotland to confirm the number of samples and analysis. The results will be compared to MS Action Levels to determine suitability for offshore disposal.

Surface water run-off and accidental spills and leakages are standard construction industry hazards and are commonly and routinely managed using current industry standard practices and procedures.

4.3.2.2 During operation

During operation, surface water run-off will be treated, as required. No other potential impacts are anticipated.

4.3.3 Summary

Neither the construction nor operation of the proposed development, given current industry practices and procedures, is considered to have a significant impact on marine water or sediment quality.

4.4 Ground Conditions

4.4.1 Existing environment

The study area is defined by the land based element of the proposed development's boundary, which is part of the Port of Leith, and has been used for a variety of land uses associated with the operation of the port since the 1960's.

[8] *https://www2.sepa.org.uk/bathingwaters/Classifications.aspx*

Previous intrusive ground investigations undertaken on the site indicate the site is underlain by Made Ground, relating to reclamation of the area from the Firth of Forth. The Made Ground is anticipated to be over 5m thick. It is anticipated that the Made Ground will be underlain by Shoreface and Beach Deposits (undifferentiated) comprising sand and gravel, which overlie the Lower Carboniferous Gullane Formation. This comprises sandstone with interbedded grey to dark grey mudstone and siltstone. The superficial aquifer map indicates a portion of the centre of the site is classified as intergranular flow with moderate productivity. The bedrock is classified as an aquifer with intergranular fracture flow with moderate productivity.

The proposed development is underlain by the Edinburgh Coastal groundwater body (ID: 150724) which has an overall status of Good. Groundwater flow direction at the site is not known, although previous ground investigations within the site indicate that there is a difference in groundwater level either side of a former sea wall. Groundwater to the south of the former sea wall is likely to be in hydraulic continuity with surface water within the impounded dock system. Groundwater to the north of the sea wall is likely to be in hydraulic continuity with the Firth of Forth and subject to greater tidal influence. However, the active sea wall on the northern boundary of the site may also inhibit the connectivity to the Firth of Forth estuary to some extent.

Potential sources of existing contamination include historical and current land uses. These have the potential to present a risk to sensitive receptors associated with the site and surrounding area; however, it should be noted that there has been no issues with land contamination within the port estate to date..

4.4.2 Potential impacts

4.4.2.1 During construction

Potential impacts on ground conditions during construction include:

- Direct impacts to aquifers due earthworks;
- Introduction of new sources of contamination i.e. from the storage of fuels and chemicals or via spillages and leaks; and,
- Direct impacts to surface water receptors from possible sources of contamination by the creation of new pathways.

Construction works will follow best practice and guidance to avoid potential risks to human health and ecology from any potential ground contamination. This includes an intrusive ground investigation that will allow appropriate assessments to be undertaken to ascertain if contaminants are present at concentrations that could result in harm to human health and controlled waters. If unacceptable risks are identified, a detailed remediation strategy will be designed and implemented for the proposed development.

4.4.2.2 During operation

Potential impacts on ground conditions during operation include:

- Indirect impacts may occur as a result of leakages of stored materials or spillages of materials during the operational phase; however, these would be managed using the Port of Leith's existing management plans.

4.4.3 Summary

Overall, potential impacts on ground conditions are not considered to be significant can be managed using standard practices.

4.5 Water Resources and Flood Risk

4.5.1 Existing environment

Flood mapping provided by SEPA[9] shows that the area of the proposed development has a high likelihood of coastal flooding with a 10% chance of flooding each year. The indicative floodplain mapping does not take account of any flood defences which may be in place along the estuary.

The Port of Leith is shown to have a high likelihood of fluvial flooding with a 10% chance of flooding each year. During extreme fluvial events on the Water of Leith waterbody (see **Section 4.3.1.1**), procedures are in place to release water from the port as quickly as it enters from the Water of Leith in order to manage the risk of flooding. The Port of Leith is not known to have flooded historically.

Previous studies have shown there are no private water supplies or surface water extraction licences held within 2km of the Port of Leith. There are three known discharge points relating to the Scottish Water treatment works east of the Port of Leith.

4.5.2 Potential impacts

4.5.2.1 During construction

Construction of the proposed development would not have any impacts on water resources. Potential impacts from the risk of flooding during construction include:

- Risk to construction workers from coastal or fluvial flooding.

Best practice measures will be adopted (including signing up to flood alerts) to avoid flood risk to construction workers during the construction phase.

4.5.2.2 During operation

Under SEPAs Guidance Note 8 (*SEPA standing advice for planning authorities and developers on development management consultations*)[10], developments of water-based infrastructure, such as pontoons, jetties, and moorings, are unlikely to have a significant impact on flood risk, and any flood related impacts can be minimised through good design. In addition, there is no infrastructure within the proposed development area that would come under either the most vulnerable or highly vulnerable uses, as defined by SEPAs Guidance Note 8.

The design of the proposed development will take account of climate change and sea level rise, in line with best practice in respect of wave and flood periods (no less than a 1 in 100 year event of either wave overtopping or flood will be designed for). The height of the wave wall will be designed to minimise wave overtopping. Furthermore, the provision of improved surface water drainage, using the best available technology, is considered to improve the situation with regards to pluvial flood risk. The proposed development is not considered to have the potential to affect the flood risk of the surrounding area.

4.5.3 Summary

Overall, potential impacts on water resources and flood risk are not considered to be significant.

[9] https://map.sepa.org.uk/floodmaps
[10] https://www.sepa.org.uk/media/136130/sepa-standing-advice-for-planning-authorities-and-developers-on-development-management-consultations.pdf

4.6 Traffic and Transport

4.6.1 Existing environment

The study area contains a mix of residential, leisure, industrial and retail areas with a mixture of strategic and local roads. Development in recent years has resulted in enhancement of public transport provision, with the area also benefiting from good walking and cycling infrastructure.

The road network around the Port of Leith can be congested at peak times, and heavy goods vehicle traffic is present due to the existing operational port, including the Shawcor facility, and industrial uses in the area. Typically, the heavy vehicle traffic travels on more strategic routes and therefore outside immediate vicinity of the site the proportion of heavy vehicle traffic reduces as routes become more local. Within the study area there are also large trip attractors such as Ocean Terminal. An extension to the tram service within Edinburgh is under construction, to connect to the Port of Leith, which is due for completion in 2023. This would alleviate some of the traffic during peak times around the Port of Leith area.

4.6.2 Potential impacts

4.6.2.1 During construction

Potential impacts to traffic and transport during construction include:

- Movements of construction workers to and from the site.

4.6.2.2 During operation

Operational impacts to traffic and transport are not anticipated for the proposed development, given all components would arrive and leave the port by sea. In addition, there would be a positive impact to traffic and transport due to the removal of the Shawcor facility from late 2021.

4.6.3 Summary

Overall, potential impacts to traffic and transport are not considered to be significant.

4.7 Noise and Vibration

4.7.1 Existing environment

The immediate surrounding area comprises existing industrial premises and residential dwellings (both existing and proposed) along Western Harbour Drive.

The closest human receptors are approximately 550m south-west from the proposed development, located off Western Harbour View and Western Harbour Drive. The Western Harbour Masterplan includes plans for a new mixed use residential, commercial, open space and school development. This would bring the closest residential properties to a distance of 300m to the west of the proposed berth.

Existing baseline noise data were used to supplement planning applications of the proposed residential schemes along Western Harbour Drive[11]; summarised in **Table 4-1**.

[11] *Full details of the baseline noise survey available within the noise impact assessment supporting planning application 19/00986/AMC*

Table 4-1 Historic baseline noise survey results

Location	Reference period	$L_{Aeq,T}$ (dB)	$L_{AF,max}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
Western Harbour Drive	Day (07:00 to 23:00)	51	83	52	44
	Night (23:00 to 07:00)	40	68	42	37
Sandpiper Drive	Day (07:00 to 23:00)	64	85	69	52
	Night (23:00 to 07:00)	49	73	52	40

During the baseline survey, there was limited activity within the Port of Leith; therefore, the noise environment was dominated by activity at nearby industrial and commercial premises and road traffic. This is reflected in the baseline data with higher noise levels measured at Sandpiper Drive than at Western Harbour Drive.

Ornithological receptors are considered in **Section 4.9**.

4.7.2 Potential impacts

4.7.2.1 During construction

During construction the following activities are considered to be the main sources of noise:

- Demolition of existing structures;
- Installation of piles;
- Infill of hardstanding areas;
- Installation of beams, deck panels and rock armour;
- Dredging; and,
- Vessels arriving with construction materials.

However, only the proposed piling works, and specifically only if impact piling is chosen as the preferred method, are considered to have the potential to cause significant levels of noise. The implementation of Best Practice Measures (BPM) will manage potential noise impacts to human receptors.

Vibration impacts due to piling activities are not considered likely at residential premises due to the separation distance from the proposed works, approximately 550m. Therefore, there would be no requirement to assess vibration impacts. Given the low level of road traffic associated with the construction of the proposed development, there would be no requirement to assess noise from construction traffic.

4.7.2.2 During operation

During operation the following activities are considered to be the main sources of noise:

- Vessels moored at the berth;
- Loading and unloading components between vessel and the hardstanding area; and,
- Movement of components between hardstanding and laydown areas.

ISO 9613-2[12] presents a formula for geometric divergence (A_{div}), which is the attenuation of sound from a point sound source in free-field conditions due to distance. The formula is presented below:

$$A_{div} = 20\log(d/d_0)$$

where d is the separation distance, in meters, and d_0 is the reference distance (=1m)

[12] *International Standards Organisation (1996) ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors Part 2:General method of calculation*

The resulting attenuation of noise from the source (i.e. the proposed berth) to a distance of 300 – 500m (i.e. the Western Harbour proposed and existing residential properties) is approximately 50 – 54 dB. This decrease in noise does not account for air and ground absorption, or screening effects and therefore presents a very conservative estimate. Given this, and the fact that the activities associated with the proposed development would be similar in nature to existing operations at the Port of Leith, operational noise impacts at the nearby residential receptors are not considered to be significant.

The use of modern equipment for the movement of components is considered to generate less noise than the current Shawcor facility, which tends to utilise HGV's and large industrial material handling machinery. No significant vibration impacts are expected.

In addition, Forth Ports Ltd is proposing to install shore-side electricity supplies on the proposed berth. Shore power supply would then be available for use by vessels with the necessary on-board equipment, which would be able to "plug-in" to this supply and not have to run their auxiliary engines whilst at berth. This would have a further positive impact on the surrounding noise environment.

As there would be no traffic impacts during operation, there can be no noise associated with operational road traffic.

4.7.3 Summary

Based upon the location of the proposed berth and separation distance to nearby residential premises, it is considered that, with adherence to standard best practice measures, construction and operation of the proposed development would not give rise to significant noise impacts. The use of modern equipment to move components would reduce noise levels compared to the operational noise of the existing Shawcor facility.

4.8 Air Quality

4.8.1 Baseline environment

Baseline air quality levels in the vicinity of the Port of Leith vary according to distance from nearby major roads. CEC declared an air quality management area (AQMA) in 2017 along Salamander Street and also covering a portion of the Port of Leith (**Figure 4-1** below), on the basis of elevated concentrations of fine particulate matter (PM_{10}) recorded at a kerbside monitoring station (Point 1 on **Figure 4-1**) near the junction of Salamander Street and Bath Road. The proposed development lies well beyond the boundary of this AQMA.

At the time, it was acknowledged that the excessive PM_{10} concentrations originated from congested road traffic emissions but there was a suspicion that activities within the Port of Leith may have contributed. A subsequent analysis of the monitoring data, backed-up by detailed monitoring of fine particulate matter at a site in Tower Street, close to the Port of Leith boundary (Point 2 on **Figure 4-1**) revealed that PM_{10} concentrations in the Port of Leith were well within Scottish air quality standards in 2018 and 2019.

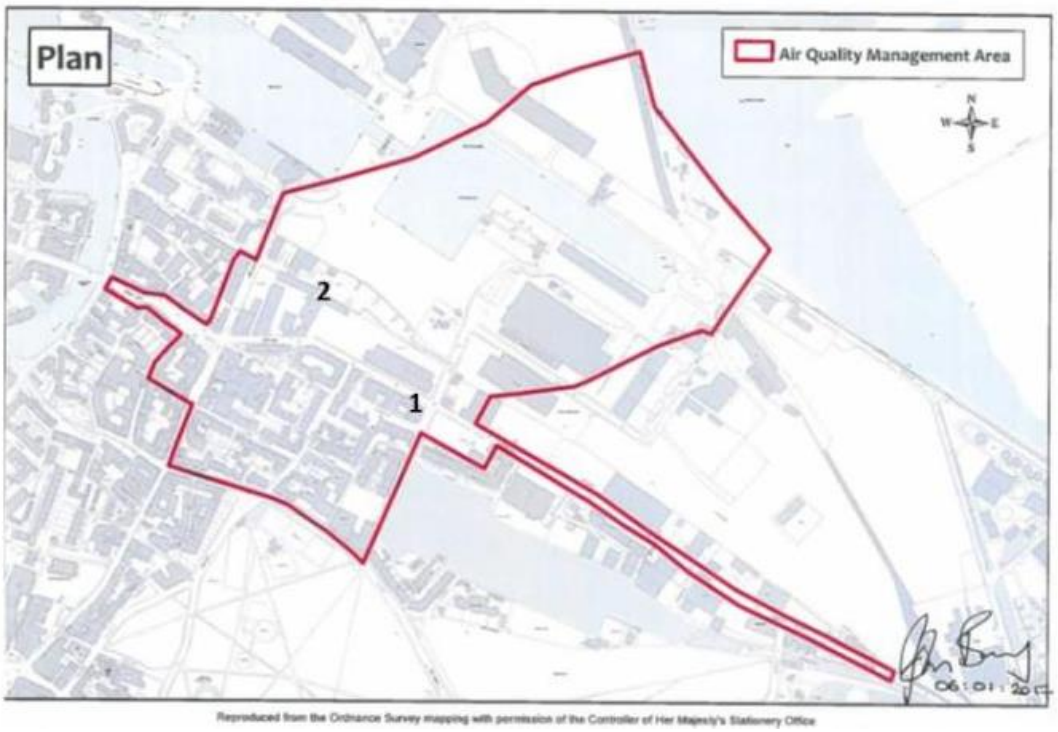


Figure 4-1 Salamander Street AQMA and nearby monitoring stations

In addition, planning permission was granted in 2019 and construction is now proceeding on residential units within the boundary of the previously declared AQMA. Air pollutant concentrations in Edinburgh have been decreasing at a number of sites across the city, and in 2018 the monitoring station at Salamander Street recorded a marginal breach (of less than 4%) of the annual average PM_{10} air quality standard. **Table 4-2** includes a summary of monitored PM_{10} concentrations at the two CEC monitoring stations.

Table 4-2 Monitored PM_{10} concentrations at Salamander Street and Tower Street

Year	Salamander Street (µg m^{-3})	Tower Street (µg m^{-3})
2018	**18.7**	**9.1**
2019	**17.1**	**10.7**
2020	**13.1**	**8.7**
Air Quality Standard	**18**	**18**

Background concentrations of nitrogen dioxide (NO_2) and PM_{10} in the four 1km by 1km grid squares on and around the Port of Leith, obtained from the Defra background maps[13], are detailed below for 2021 in **Table 4-3**, compared with the air quality standards.

Table 4-3 Mapped background air pollutant concentrations for 2021

Grid Square Centroid	NO_2 Annual Average, µg m^{-3}	PM_{10} Annual Average, µg m^{-3}
326500,677500	12.1	9.9
327500,677500	12.8	10.7
326500,676500	15.1	11.6
327500,676500	13.3	12.1
Air Quality Standard	**40**	**18**

[13] http://www.scottishairquality.scot/data/mapping?view=data

Background concentrations are well within the air quality standards for both air pollutants. This has been confirmed by fine particulate (PM_{10} & $PM_{2.5}$) monitoring carried out by Forth Ports Limited in the Western Harbour area for six months in 2018 and a full calendar year in 2019. The results of this monitoring are summarised in **Table 4-4**.

Table 4-4 Fine particulate monitoring results at Western Harbour 2018-2019

Year	PM_{10} Period Average, µg m^{-3}	$PM_{2.5}$ Period Average, µg m^{-3}
2018 – 5 months, August-December	5.7	4.2
2019 – Full calendar year	6.9	5.0
Air Quality Standard	**18**	**12**

Across Edinburgh as a whole, the general picture is one of gradually improving ambient air quality, as stated in the CEC 2020 Air Quality Annual Progress Report (APR)[14], reporting monitoring results for 2019:

- "Exceedances of the NO_2 annual objective have continued to be monitored within St John's and the City Centre AQMAs, therefore these remain valid."
- "For the third consecutive year, Great Junction Street AQMA has reported no breaches of the NO_2 annual objectives. A review will be undertaken to consider the potential revocation of the AQMA, particularly in relation to changing traffic management priorities in the area. With the Inverleith Row AQMA, there was no breach of the said objective for the second year in a row. Monitoring will continue to assess whether this AQMA can be revoked in the future."
- "St John's Road AQMA is also declared for exceedances of the NO_2 1-hour objective. 2019 is the fourth consecutive year in which less than 18 hourly concentrations greater than 200 µg/m^3 were reported. Therefore, the Council will amend the AQMA to remove this designation."
- "PM_{10} and $PM_{2.5}$ monitoring data shows that for all locations, except Salamander Street, there are no breaches of the Scottish objectives. Salamander Street has reported a breach of the annual mean PM_{10} objective when using the local factor to adjust the TEOM data."
- "Trend analysis has shown that for NO_2, PM_{10}, and $PM_{2.5}$, concentrations are largely decreasing across Edinburgh. In some locations (Currie, NO_2, and Glasgow Road, PM_{10}) the concentrations are remaining stable, however no exceedances are located in these areas."

The prevailing wind blows from between west and south-west, although there is a percentage of the year, typically, when the wind blows from the east-north-east (**Figure 4-2**).

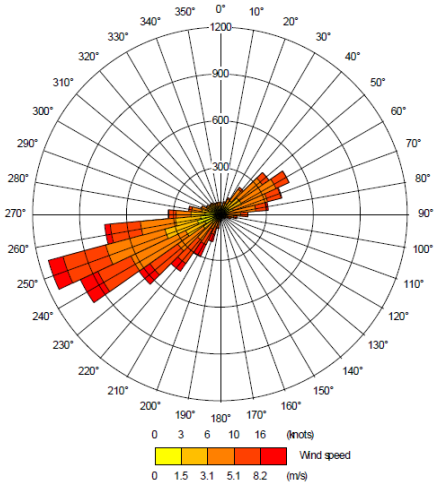


Figure 4-2 Wind rose for Edinburgh (calendar year 2016)

[14] https://www.edinburgh.gov.uk/downloads/file/28720/laqm-annual-progress-report-2020

4.8.2 Receptors

The closest human receptors to the proposed development lie approximately 550m to the west in the existing Western Harbour development, along Western Harbour View. Other residential properties lie between 650m and 730m to the south-west, along Western Harbour Midway, and between 850m and 930m to the south-west, along Western Harbour Way. The next closest residential properties lie more than 1,000m to the south-east, the Cala Homes development along Ocean Drive, opposite Ocean Terminal. Additional properties are under construction on the other side of Ocean Drive, some 1,100m to the south-east of the proposed berth. Also, the remainder of the Western Harbour area has been approved for a mixed use residential, commercial, open space and school development. This would bring the closest residential properties to a distance of 300m to the west of the new proposed berth.

With regard to sensitive ecological receptors, there are a number of national and international designated sites within 1km of the proposed development; however, none are sensitive to impacts to air quality, given their intertidal nature or that they only supporting breeding birds (i.e. the breeding tern colony located within the port).

4.8.3 Potential impacts

4.8.3.1 During construction

During construction the following activities are considered to have the potential to give rise to dust emissions:

- Excavation of existing materials;
- Infilling of hardstanding areas and placement of surface layer; and,
- Installation of rock armour.

Application of the standard dust control and management techniques, as laid out in the Institute of Air Quality Management (IAQM) guidance document[15] would ensure that no significant effects arise in respect of dust or fine particulate matter.

Similarly for emissions from construction plant operating on the berth and associated infrastructure sites, given that emissions are now regulated by The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018[16], the separation distance from sensitive receptors and the direction of the prevailing wind, these are not considered to represent a significant effect upon air quality.

The greater majority of the materials for construction of the berth and associated infrastructure would be delivered by sea, in order to minimise the road (HGV) movements to and from the Port of Leith and this would take place at intervals over the construction period. There would be some additional light-duty road vehicle (LDV) movements associated with construction workers' travel to and from the site; however, this would be offset by the decommissioning of the Shawcor facility.

4.8.3.2 Operational phase

Once the berth and associated infrastructure are operational, the only emissions to atmosphere would be from vessel exhausts from ships at berth (and arrival/departure) and from shoreside materials handling plant and equipment, all of which occurs at present within the Port of Leith.

Port of Leith is within the North Sea Emissions Control Area under Annex VI of MARPOL, which means that vessels at berth in port have to use low-sulphur distillate fuels, rather than heavy fuel oil, or scrubbers. This

[15] https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf
[16] https://www.legislation.gov.uk/uksi/2018/764/made

achieves a reduction in emissions of sulphur dioxide and particulate matter. This, coupled with the fact that the berth is greater than 500m down prevailing wind from the nearest existing sensitive receptors and 300m from future committed residential development, means that there would be no significant effects upon air quality. The removal of the Shawcor facility and associated emissions to the atmosphere would result in an overall positive impact on local air quality.

Forth Ports Ltd is proposing to install shore-side electricity supplies on the proposed berth. Shore power supply would then be available for use by vessels with the necessary on-board equipment, which would be able to "plug-in" to this supply and not have to run their auxiliary engines whilst at berth. This would have a further positive impact on air quality.

4.8.4 Summary

Based upon the location of the proposed development, existing air quality conditions, the prevailing winds and remoteness of sensitive receptors, it has been concluded that the construction and operation of the proposed development would not give rise to significant effects upon air quality. The removal of the Shawcor facility and provision of shore power would have positive effects on air quality.

4.9 Ornithology

4.9.1 Existing environment

The proposed development is adjacent to a number of sites designated to protect national and internationally important bird species. These include the Outer Firth of Forth and St Andrews Bay Complex SPA, Firth of Forth SPA and Ramsar site, Imperial Dock Lock, Leith SPA, and Forth Islands SPA and Ramsar site. **Table 4-5** provides details of the species protected within these designations.

Table 4-5 Nature conservation designations within 2km for which birds are a reason for designation

Site name and designation	Distance from the proposed development	Designated species
Outer Firth of Forth and St Andrews Bay Complex SPA	Adjacent	Annex 1 populations of European importance, non-breeding: • Red-throated diver (*Gavia stellata*) • Slavonian grebe (*Podiceps auritus*) • Little gull (*Larus minutus*) Breeding: • Common tern (*Sterna hirundo*) • Arctic tern (*Sterna paradisaea*) Migratory populations of European importance, non-breeding: • Eider (*Somateria mollissima*) • Waterfowl assemblage (long-tailed duck (*Clangula hyemalis*), common scoter (*Melanitta nigra*), velvet scoter (*Melanitta fusca*), goldeneye (Bucephala clangula), red-breasted merganser (*Mergus serrator*)) Breeding: • Shag (*Phalacrocorax aristotelis*) • Gannet (*Morus bassanus*) • Seabird assemblage, breeding (puffin (*Fratercula arctica*), kittiwake (*Rissa tridactyla*), Manx shearwater (*Puffinus puffinus*), guillemot (*Uria aalge*), herring gull (*Larus argentatus*) • Seabird assemblage, non-breeding (black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), herring gull, guillemot, shag, kittiwake, razorbill)

Site name and designation	Distance from the proposed development	Designated species
Firth of Forth SPA (and Ramsar site)	Adjacent	Annex 1 populations of European importance, non-breeding: • Red-throated diver • Slavonian grebe[17] • Golden plover (*Pluvialis apricaria*) • Bar-tailed godwit1 (*Limosa lapponica*) Post-breeding (passage): • Sandwich tern[7] (*Thalasseus sandvicensis*) Migratory populations of European importance (non-breeding): • Pink-footed goose[7] (*Anser brachyrhynchus*) • Shelduck[7] (*Tadorna tadorna*) • Knot[7] (*Calidris canutus*) • Redshank[7] (*Tringa totanus*) • Turnstone[7] (*Arenaria interpres*) • Waterfowl assemblage[7] (great-crested grebe (*Podiceps cristatus*), cormorant (*Phalacrocorax carbo*), scaup (*Aythya marila*), eider, long-tailed duck, common scoter, velvet scoter, goldeneye[7], red-breasted merganser, oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), dunlin (*Calidris alpina*), and curlew (*Numenius arquata*).
Imperial Dock, Leith SPA	0.8km	Annex 1 populations of European importance, Breeding: • Common tern
Forth Islands SPA	Adjacent	Annex 1 populations of European importance, breeding: • Arctic tern • Common tern • Roseate tern (Sterna dougallii) • Sandwich tern Migratory populations of European importance, breeding: • Gannet • Lesser black-backed gull • Puffin • Shag • Seabird assemblage (razorbill, guillemot, kittiwake, herring gull, cormorant)

Between 2010 and 2011, non-breeding bird surveys were carried out over the winter period, identifying a total of 21 waterfowl species, with a peak count of the waterfowl assemblage of 454 birds, within or adjacent to the port (SKM, 2012). The only species recorded in numbers greater than 25 within these surveys were eider, goldeneye, oystercatcher, knot, curlew and redshank. Oystercatcher was the most numerous species recorded (peak count 300), with the greatest numbers recorded roosting on the East Breakwater (SKM, 2012).

Breeding surveys were also carried out in 2010, which recorded very few species within the port, with the most notable species being common tern (with 818 pairs in 2010) and little ringed plover (2 pairs). Peregrine was also recorded but is not known to breed within the port area (SKM, 2012).

[17] *listed on Ramsar site citation in addition to SPA citation.*

4.9.2 Potential impacts

4.9.2.1 During construction

Potential impacts on bird species during construction include:

- Disturbance – disturbance (noise and visual) to breeding and non-breeding birds, although it should be noted that the site is currently an active port subject to high existing levels of disturbance. Sources of disturbance are likely to include noise, lighting, presence of people and plant / machinery and vehicular / shipping traffic, both onshore and offshore;
- Water quality impacts affecting prey availability – due to the potential release of contaminants and increased turbidity; and,
- Loss of prey species due to underwater noise.

4.9.2.2 During operation

It is considered that there would not be any potential for significant impacts to ornithology during the operational phase of the proposed development, given no significant changes are proposed to the current activities at the Port of Leith.

4.9.3 Summary

There is the potential for bird species to be affected by the proposed construction activities; however, given these impacts would be short term and temporary, and managed using standard best practice measures, significant impacts would not occur.

Potential impacts will be discussed and agreed with NatureScot via the Habitats Regulations Appraisal (HRA) process to ensure that potential impacts to ornithology are not significant.

4.10 Terrestrial and Coastal Ecology

4.10.1 Existing environment

The Habitat Map of Scotland (**Figure 4-3**) shows that, within the proposed development boundary, the only habitat noted is '*buildings of cities, towns, and villages'* (habitat code J1). Other adjacent habitats include '*surface standing waters'* (habitat code C1) and '*inland standing waters'* (habitat code C). There are localised areas of '*Atlantic hay meadow'* (habitat code E2.21), and '*broadleaved deciduous woodland'* (habitat code G1); neither of which are closer than 1.1km to the site boundary. To the south-east of the project boundary, is an area of '*annual vegetation of driftlines'*, an Annex I habitat (habitat code B2.12; approximately 870m from the project site).

The foreshore adjacent to the proposed development is designated as the Firth of Forth SSSI. This designation protects an extensive coastal area on the east coast of Scotland. The sites stretch from Alloa Inches in the River Forth to Fife Ness and Dunbar in the east.

Intertidal habitats along the outer edge of the harbour are relatively exposed, and there are sediments ranging from sandy beach (East Sands of Leith) to rocky outcrops. Studies undertaken for Forth Properties Ltd (2007) and by SKM (2011) indicate the intertidal benthic environment on the areas immediately surrounding Leith Docks are defined by man-made hard substrate, such as breakwaters. The man-made substrates were recorded as exhibiting a distinctive zonation pattern of species, relative to the aspect of the slope. The southerly sides showed a lowered diversity than northerly sides of breakwaters and were dominated by barnacles above patchy fucoids with scattered periwinkles, limpets and mussels.

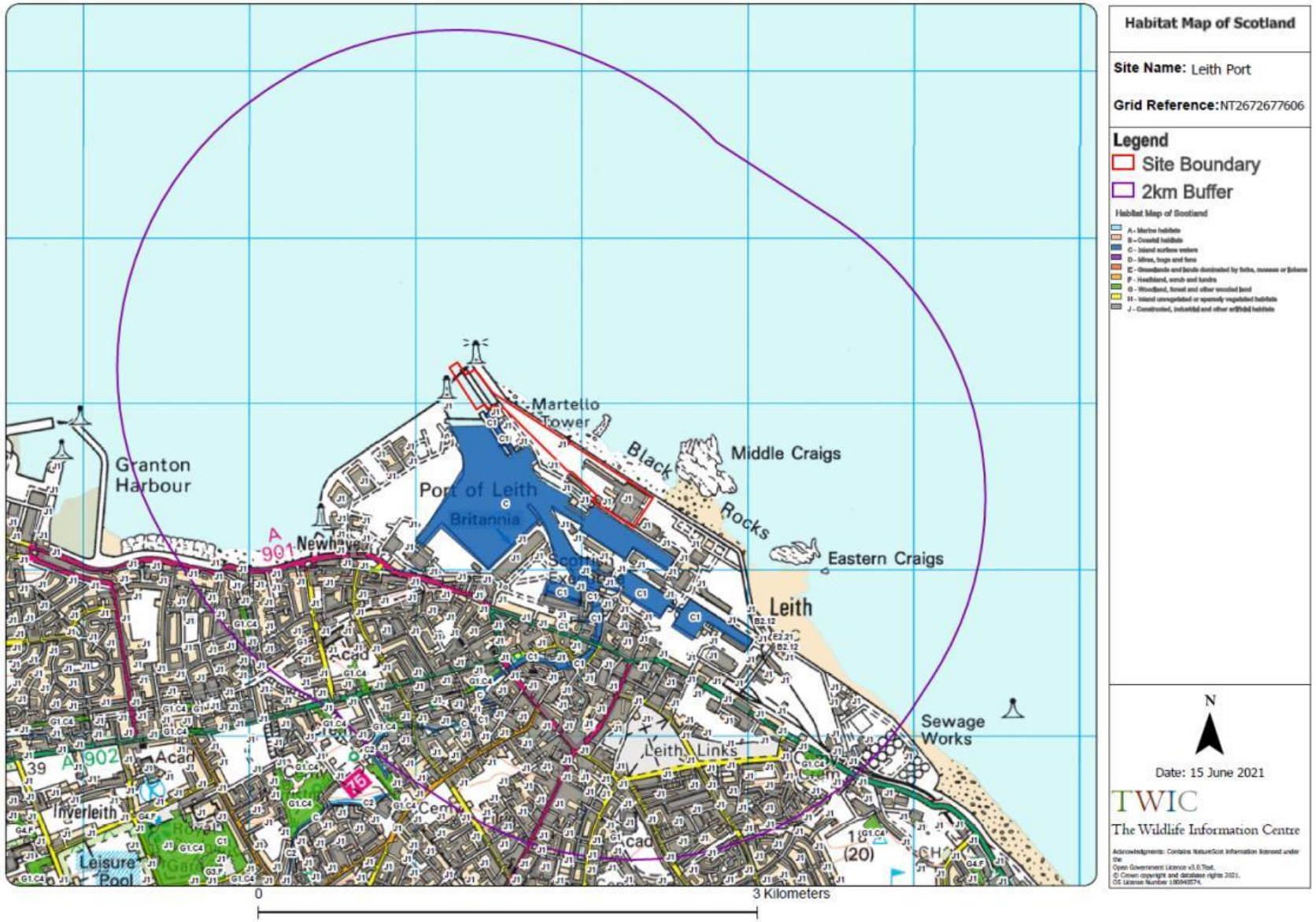


Figure 4-3 Terrestrial habitats within 2km of the proposed development (from the Habitat Map of Scotland)

An extended Phase 1 Habitat Survey was undertaken in June 2012 which recorded no rare or notable plant species, although there are historic records for notable plant species including corn buttercup (*Ranunculus arvensis*) and bog-rosemary (*Andromeda polifolia*) (SKM, 2012).

Table 4-6 below describes the key species that have been reported to the Wildlife Information Centre, within 2km of the proposed development, over the previous five year period (from 2015 to 2021 (to date)), that are afforded protection through national or international legislations.

Table 4-6 Summary of the key species reported to the Wildlife Information Centre (2015 – 2021 (to date))

Species	Distance to site boundary (at closest point)	Protections and Status
Within 2km of site boundary		
Chicory *Cichorium intybus*	391m	Scottish Biodiversity List of species of principal importance for biodiversity conservation (ScotBL).
European rabbit *Oryctolagus cuniculus*	715m	IUCN - Global Red List: Near Threatened (RLGLB.NT).
European otter	973m (opposite side of port)	Bern2; HabRegs2; Habitats Directive Annex 2 (Priority Species) (HSD2p); HSD4; ScotBL; UK Biodiversity Action Plan Priority Species (UKBAP); WCA5/9.4b; WCA5/9.4c.
Weasel *Mustela nivalis*	1,114m	Bern3
Pipistrelle	1,149m	Bern Convention Appendix 2 (Bern2); Bern3; CMS_A2; CMS_EUROBATS-A1; HabRegs2; HSD4; ScotBL; WCA5/9.4b; WCA5/9.4c
Soprano pipistrelle	1,158m	Bern2; CMS_A2; CMS_EUROBATS-A1; HabRegs2; HSD4; ScotBL; UKBAP; WCA5/9.4b; WCA5/9.4c.
Red mason bee *Osmia bicornis*	1,258m	ScotBL
Fork-tailed flower bee *Anthophora furcata*	1,273m	ScotBL
Eurasian badger	1,431m	Bern Convention Appendix 3 (Bern3); Protection of Badgers Act (1992) (PBA).
West European hedgehog *Erinaceus europaeus*	1,484m	Bern3; IUCN - Global Red List: Vulnerable (RLGB.VU) ScotBL; UKBAP
Common pipistrelle	1,674m	Convention on Migratory Species Appendix 2 (CMS_A2); Convention on Migratory Species - EUROBATS Annex 1 (CMS_EUROBATS-A1);

Species	Distance to site boundary (at closest point)	Protections and Status
		The Conservation (Natural Habitats c.) Regulations 2010 (Schedule 2) (HabRegs2); Habitats Directive Annex 4 (HSD4); Wildlife and Countryside Act 1981 Schedule 5 Section 9.4b (WCA5/9.4b); Wildlife and Countryside Act 1981 Schedule 5 Section 9.4c (WCA5/9.4c).

A number of different bat species have been recorded within 2km of the site boundary within the five year period, the closest being just approximately 1,150m from the site boundary. During a site walkover survey undertaken in 2012 (SKM, 2012), three buildings were identified as providing potentially suitable bat roosting habitat, but with a low risk that bats would be present, however, the site was assessed to be of low quality for foraging bats (SKM, 2012). In addition, previous surveys undertaken on the site found no bats roosting within the site, and very low levels of bat activity were recorded (SKM, 2012). Due to the limited potential for providing good foraging areas, and that very minimal bat activity has been recorded within the proposed development areas themselves, it is considered unlikely for there to be any bat presence within the site boundary that would be at risk of any potential impact.

Otter have not been reported within the proposed development site boundary since 2015, and the closest record was 973m from the site; however, there is still the potential for otter to be present within the site boundary.

While badger have been recorded within 2km of the site boundary, the closest record is for over 1,400m form the site, and there is no habitat within the site boundary itself that would be suitable for this species.

4.10.2 Potential impacts

4.10.2.1 During construction

Potential impacts on terrestrial and coastal ecology during construction include:

- Loss of a small area of artificial intertidal habitat; and,
- Species mortality/injury – e.g. potential for otter to fall into excavated areas, potential for bats to be affected should they roost in the buildings to be demolished; however, the potential is considered to be very low given the nature of the buildings and the level of activity of the surrounding area.

4.10.2.2 During operation

No impacts to terrestrial and coastal ecology would occur during the operational phase.

4.10.3 Summary

The loss of the small area of intertidal habitat is not considered significant. Given this and the implementation of standard best practice measures, including the walkover survey and measures to protect otters, potential impacts to terrestrial and coastal ecology would not be significant.

4.11 Marine Benthic Ecology

4.11.1 Existing environment

The subtidal environment within and surrounding the Port of Leith generally comprises relatively shallow water (less than 5m) over sandy, muddy and silty soft sediments (Forth Properties Ltd, 2007). EMODnet

broad-scale seabed habitat mapping suggests that the seabed within the footprint of the proposed development is comprised of infralittoral mixed sediments.

Benthic species in the vicinity of the Port of Leith are common to the area and include the bivalve *Abra alba* and common mussel *Mytilus edulis* (Jacobs Arup, 2009; Forth Properties Ltd, 2007).

4.11.2 Potential impacts

4.11.2.1 During construction

Potential impacts on marine benthic ecology during construction include:

- Loss of benthic habitat as a result of the proposed dredging;
- Increased turbidity and smothering of benthic habitats as a result of the proposed dredging;
- Release of contaminants as a result of the proposed dredging; and,
- Accidental leaks and spillages.

4.11.2.2 During operation

No impacts to marine benthic ecology would occur during the operational phase.

4.11.3 Summary

The majority of the area to be dredged is within the currently dredged approach channel to the Port of Leith. Furthermore, predicted increases in suspended sediment and subsequent deposition are not considered to be significant (see **Section 4.2.2.1**). The potential for the release of contaminants during dredging and disposal will be determined by the sediment quality survey, with mitigation measures put in place as required. Given this, and the adherence of standard mitigation measures to avoid/manage accidental spills and leaks, potential impacts to marine benthic ecology would not be significant.

4.12 Fish and Shellfish Ecology

4.12.1 Existing environment

The Firth of Forth supports a diverse range of fish species, and encompasses several areas reported to be spawning and nursery grounds for species, including herring *Clupea harengus,* cod *Gadus morhua,* whiting *Merlangius merlangus,* plaice *Pleuronectes platessa*, sprat *Sprattus*, and lemon sole *Microstomus kitt* (Ellis *et al*., 2012; Coull *et al.,* 1998). An abundance of other species are also known to be present in the wider area, including mackerel *Scomber scombrus*, blue whiting *Micromesistius poutassou,* ling *Molva molva* (Ellis *et al*., 2012; Coull *et al.,* 1998).

A number of fish species are seasonally present in the area, as they migrate through the Firth of Forth upstream to freshwater spawning grounds. These species may spawn or have nursery areas in the lower estuary (e.g., allis shad *Alosa alosa* and twaite shad *Alosa fallax*) or in the rivers e.g., Atlantic salmon *Salmo salar* and sea trout *Salmo trutta* (SKM, 2012).

The European eel *Anguilla* moves from freshwater to the sea to spawn, and also passes through the Firth of Forth on its way to spawning grounds in the sea (Malcolm *et al.,* 2010). Data collected at the Longannet power station further upstream shows that a number of species migrate through the estuary, including European smelt *Osmerus eperlanus*, river lamprey *Lampetra fluviatilis*, European eel, Atlantic salmon and sea trout (SKM, 2011). Sea lamprey *Petromyzon marinus*, river lamprey and Atlantic salmon are designated under the River Teith SAC.

Several other fish species are known to be present within the Firth of Forth, including flounder *Pleuronectus flesus,* plaice, lesser sandeel *Ammodytes tobianus*, whiting, common goby *Pomatoschistus microps*, lesser spotted dogfish *Scyliorhinus canicular*, and sprat *Sprattus sprattus* (Forth Properties Ltd, 2007; Jennings *et al*., 2012).

A range of shellfish species are found in the vicinity of the Leith Docks area, including brown shrimp *Crangon crangon,* which have been recorded throughout the Forth estuary, while the pink shrimp *Pandalus montagui* occurred in the lower reaches of the estuary (Jayamanne, 1995). Razor shells *Ensis spp*. have been recorded in the inshore areas (Robson, 1997). Other shellfish species found in southeast Scotland that may be found in the area include European lobster *Hommarus Gammarus*, edible/brown crab *Cancer pagurus*, velvet swimming crab *Necora puber*; king scallop *Pecten maximus*, Norway lobster *Nephrops norvegicus*, and squid *Loligo forbesi* (Beard and McGregor, 2004; Robson, 1997).

4.12.2 Potential impacts

4.12.2.1 During construction

Potential impacts to fish and shellfish ecology during construction include:

- Generation of underwater noise from piling operations, which could have physiological and/or behavioural response impacts;
- Impacts due to changes to water quality (e.g., increased suspended sediment); and,
- Impacts due to a change in habitat quality (e.g. increased sedimentation, loss of habitat).

Piling would be temporary and for a short period only. Underwater noise impacts would be managed by the standard mitigation measures proposed for marine mammals (see **Section 4.13.2.1**).

The potential for indirect impacts due to changes in water quality and prey availability will be based on assessments undertaken for other relevant sections, including coastal processes (**Section 4.2**), marine water and sediment quality (**Section 4.3**), benthic ecology (**Section 4.11**); however, potential impacts are not considered to be significant.

4.12.2.2 During operation

There is not expected to be any significant change, through operation, compared to the existing activity levels; therefore, it is not expected that there would be any potential to impact fish and shellfish ecology during the operational phase.

4.12.3 Summary

There is the potential for fish species to be affected by the proposed construction activities; however, given these impacts would be short term and temporary, and managed using standard best practice measures, significant impacts would not occur.

Potential impacts to Sea lamprey *Petromyzon marinus*, river lamprey and Atlantic salmon are designated under the River Teith SAC. Potential impacts to these species will be discussed and agreed with NatureScot via the HRA process to ensure that they are not significant.

4.13 Marine Mammals

4.13.1 Existing environment

A number of marine mammal species are found off the east coast of Scotland, and within the Firth of Forth, with the most common being harbour porpoise *Phocoena phocoena*, white-beaked dolphin *Lagenorhynchus albirostris*, grey seal *Halichoerus grypus* and harbour seal *Phoca vitulina* (Paxton *et al*., 2016; Waggitt *et al*., 2020; Carter *et al*., 2020). Other species include minke whale *Balaenoptera acutorostrata*, with increased presence in the summer periods (DECC, 2016; Paxton *et al*., 2016; Waggitt *et al*., 2020). In recent years, the population of bottlenose dolphin *Tursiops truncatus* has been increasing in this area, as the Moray Firth population extends its range south (Civil *et al*., 2018). Less common marine mammal species in this area include humpback whale *Megaptera novaeangliae*[18], killer whale *Orcinus orca*, Atlantic white-sided dolphin *Lagenorhynchus acutus*, Risso's dolphin *Grampus griseus* and long-finned pilot whales *Globicephala melas* (DECC, 2016; Waggitt *et al*., 2020).

Reported sightings of marine mammal species to the Seawatch Foundation in 2021 (from February to June), within the Firth of Forth, include mainly bottlenose dolphin, with lower numbers of sightings of harbour porpoise, harbour seal, sei whale *Balaenoptera borealis* and humpback whale.

There are a number of marine mammal protected areas along the east coast of Scotland, including:

- Southern Trench Marine Protected Area (MPA), designated for minke whale - approximately 190km from the proposed development;
- Moray Firth SAC, designated for bottlenose dolphin - approximately 300km from the proposed development;
- Firth of Tay and Eden Estuary SAC, designated for harbour seal - approximately 64km from the proposed development;
- Isle of May SAC, designated for grey seal - approximately 43km from the proposed development; and,
- Berwickshire and North Northumberland Coast SAC, designated for grey seal - approximately 63km from the proposed development.

While minke whale are not regularly a common species within the Firth of Forth, the Regional Baselines for Marine Mammals (Scottish Marine and Freshwater Science, 2020) report shows that within the Firth of Forth, an adjusted density of 0-0.10 individuals per km^2 may be observed, with adjusted densities of up to 10 per km^2 observed within the Southern Trench MPA area. Due to the distance between the MPA and the proposed development, there is no potential for direct impacts.

Within the Firth of Forth, a relatively high number of grey seals breed, with a total pup production of 6,894 in 2018, an increase of 4.2% from the previous count in 2014 (SCOS, 2020). Along the east coast of Scotland (from the English border to Fraserburgh), the number of harbour seals are lower, with approximately 343 individuals (SCOS, 2020). Within the Firth of Forth, there are densities of grey seal of up to 0.109 individuals per 25km^2, and harbour seal densities up to 0.151 individuals per 25km^2 (Carter *et al*., 2020).

Within the Firth of Forth the closest designated seal haul-out site[19] is Inchkeith, for grey seal, approximately 4.5km from the proposed development. As such, designated seal haul-out sites would not be affected by the proposed development; however, surveys undertaken between 2004 and 2007, for the Leith Docks Framework for Development, indicated haul out sites for both harbour and grey seals on the rocky outcrops

[18] https://www.edinburghlive.co.uk/news/edinburgh-news/incredible-video-captures-huge-humpback-19884228
[19] *The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014*

to the east of the eastern breakwater at the Docks, with rare sightings of the species within the docks (Forth Properties Ltd, 2007). Both species were frequently recorded in the area by Jacobs Arup (2009).

The marine mammal species most likely to be present within potential impact ranges of the proposed development are harbour porpoise, bottlenose dolphin, grey seal, and harbour seal. Other species that may be present, although in lower numbers, are white-beaked dolphin and minke whale, as well as less common species such as humpback whale.

4.13.2 Potential impacts

4.13.2.1 During construction

Potential impacts on marine mammals during construction include:

- Generation of underwater noise from piling operations and other construction activities (such as dredging), which could have physiological and/or behavioural response impacts; and,
- Indirect impacts due to changes to water quality (e.g., increased suspended sediment) and prey availability.

Piling would be temporary and for a short period only. Underwater noise impacts would be managed using standard mitigation measures in line with the *Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise*[20]. This will ensure that the potential impact ranges for instantaneous permanent auditory injury are mitigated for and therefore not significant.

For the potential for indirect impacts due to changes in water quality and prey availability will be based on assessments undertaken for other relevant sections, including coastal processes (**Section 4.2**), marine water and sediment quality (**Section 4.3**), benthic ecology (**Section 4.11**), and fish and shellfish ecology (**Section 4.12**); however, potential impacts are not considered to be significant.

Any increase in vessels through the construction phase is expected to be minimal, and in line with current use of the port and surrounding area. Therefore, it is not expected that there would be any potential for impact as a result of the presence of construction vessels (including impacts as a result of underwater noise, or collision risk), either at the proposed development, or while transiting past any nearby seal haul-out sites. Due to the distance between seal haul-out sites and the proposed development, there is not expected to be any potential for direct impact to the sites.

Marine mammals that are qualifying features of the SACs will be assessed by a HRA, of which Stage 1 (Screening for Likely Significant Effect) has already been undertaken (Royal HaskoningDHV, 2021).

4.13.2.2 During operation

There is not expected to be any significant change, through operation, compared to the existing activity levels; therefore, it is not expected that there would be any potential to impact marine mammals during the operational phase.

4.13.3 Summary

With the adherence to the proposed mitigation measures, potential impacts to marine mammals would not be significant.

[20] https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf

4.14 Commercial Fisheries

4.14.1 Existing environment

The proposed development is located within ICES rectangle 40E6. Fisheries landing data indicates that the fishing activities within ICES rectangle 40E6 are mainly undertaken by smaller fishing vessels of 10m and under that fish for shellfish species using pots and traps. 2019 landings data is presented in **Table 4-7** which shows the area is productive and valuable for the shellfish industry.

Table 4-7 Sea fisheries landings in 2019 from ICES rectangle 40E6 by landed weight and value

Species	Landed weight (tonnes)	Value (£)
Crabs	13.85	32,380
Lobster	8.69	115,825
Mackerel	0.054	92
Nephrops	2.29	11,979
Whelks	3.49	3,823
Total	**28.38**	**164,101.77**

Commercial fishing vessels do not land their catch at the Port of Leith. Data gathered for the ScotMap Inshore Fisheries Mapping Project indicates that potting for crabs and lobster is undertaken within the Firth of Forth between Burntisland and the Port of Leith, however the majority of activity is concentrated on the coastline to the east, around North Berwick and Dunbar (Marine Scotland, 2013).

4.14.2 Potential impacts

4.14.2.1 During construction

Potential impacts on commercial fisheries during construction include:

- Impacts to commercial fish species leading to displacement or reduction in available fish and shellfish resource.

As for fish and shellfish ecology (**Section 4.12**), potential impacts to fish species can be managed by adherence to standard mitigation measures.

4.14.2.2 During operation

There is not expected to be any significant change, through operation, compared to the existing activity levels; therefore, it is not expected that there would be any potential to impact marine mammals during the operational phase.

4.14.3 Summary

With the adherence of the proposed mitigation measures, potential impacts to commercial fisheries would not be significant.

4.15 Commercial and Recreational Navigation

4.15.1 Existing environment

4.15.1.1 The Port of Leith

The Port of Leith is Scotland's largest enclosed deep-water port. The port contains a number of locked berths for vessels up to 210m length and 30 metres beam including large bulk carriers, support and supply vessels and enabling Roll on-Roll of and Load On-Load Off facilities and capable of handling in excess of 1 million tonnes of cargo.

The Port of Leith is generally approached via the Leith Channel (shown in **Figure 4-4**), which runs from South Channel and Narrow Deep, to a position to the southeast of Inchkeith Island. Entry to the Port of Leith is through a dredged approach channel with a maintained depth of -6.7m CD, and the Leith Approach is marked with a lateral buoy (to indicate the edge of the approach channel).

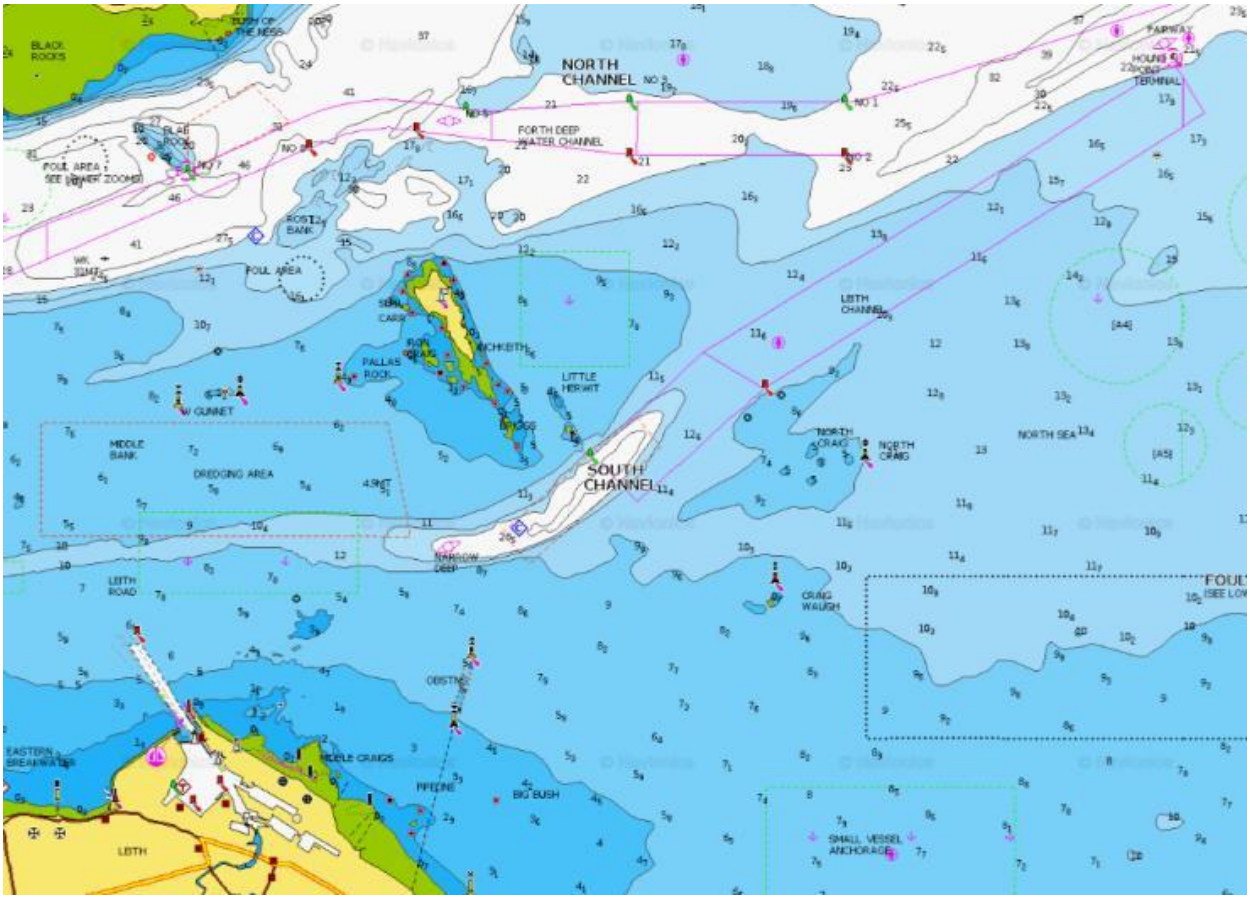


Figure 4-4 Navigation chart of the outer Firth of Forth and Port of Leith in the bottom left corner (Navionics, 2021)

For vessels carrying 12 or more passengers, pilotage is compulsory within the Forth on passing west of 3° W (in the vicinity of the eastern limits of the Forth Deep Water Channel and Leith Channel). Pilotage is also compulsory for vessels bound for South Channel and Leith of 45m Length Overall (LOA) or more carrying dangerous cargoes, and all other vessels of 80m LOA or more, on passing west of 3° 06'.1 W (the western limit of the Leith Channel, to the southeast of Inchkeith). Vessels of 150m length and over and vessels carrying 12 of more passengers embark the pilot at the Fairway Light Buoy, at the eastern limit of the Leith Channel, whereas vessels of less than 150m in length routing to South Channel embark the pilot within the

Leith Channel. Pilot vessels operate out of the Forth Pilot Station at Granton on the south shore of the Firth of Forth.

Forth Ports Ltd, as the Statutory Harbour Authority, actively and responsibly manage shipping receptors within the Forth and Tay through the Forth and Tay Navigation Service. Vessels navigating within the Firth of Forth are covered by the Forth and Tay Vessel Traffic Service (VTS).

The vast majority of vessels routing to and from Leith use the existing approach channel. Vessels using the Port of Leith include passenger vessels (cruise ships), cargo vessels, tugs, offshore support vessels and for example include facilities for agricultural, road salt and aggregate cargoes.

4.15.1.2 Cruise ships

The Port of Leith provides marquee facilities for visiting smaller-sized cruise ships, enabling visitors direct access to the city of Edinburgh and the surrounding area. The Port of Leith handled 85 cruise ship calls in 2019, and none in 2020 (attributable to the Covid-19 pandemic) and 30 cruises are programmed for arrival at Leith in 2021.

4.15.1.3 Recreational navigation

A small marina is present in Newhaven Harbour adjacent to the Port of Leith and there are marinas in Granton. The Royal Forth Yacht Club are based in Granton Harbour and host annual racing events such as the Edinburgh Cup and the Scottish Dragon Championship. A series of special purpose race mark buoys are set out in the area between the port and Granton Harbour. Granton Harbour also provides facilities for visiting yachts. However, the majority of recreational activity is based around Port Edgar near the Forth Road Bridge, approximately 14 km west of the Port of Leith.

4.15.2 Potential impacts

4.15.2.1 During construction

Potential impacts on commercial and recreational navigation during construction include:

- Risk of collision due to the presence of construction vessels;
- Restriction or delay of port activities due to the presence of construction vessels; and,
- Reduced visibility of other nearby vessels at night due to construction lighting.

4.15.2.2 During operation

Potential impacts on commercial and recreational navigation during operation include:

- Delay to inbound or outbound vessels due to a vessel berthed at the outer berth; and,
- Changes to navigational aids associated with the entrance to the Port of Leith.

4.15.3 Summary

Forth Ports Limited will manage the construction and operation activities associated with the proposed development through the issuing of Notice to Mariners and communication of access to the Port and berth availability through the Forth and Tay Navigation Service. Potential impacts would be limited to the Port itself and not be significant.

4.16 Infrastructure and Other Users

4.16.1 Existing environment

4.16.1.1 Existing infrastructure

To the east and west of the Port of Leith are a number of pipelines including Seafield Waste Water Treatment 3km to the east and Granton Sewage Pumping Station at Granton, 2km to the west. Telecommunication cables are also present to the east and west of the Port of Leith, which cross the Firth of Forth; however, these are more than 3km from the proposed development. There are no gas or oil pipelines in the vicinity of the proposed development, nor is the proposed development near to a licensed oil and gas block.

There are five licenced offshore disposal sites within the outer Firth of Forth, three are within 10km of the proposed development – Narrow Deep (FO039), Narrow Deep B (FO038) (to the north-east) and Oxcars Main (FO041) (to the north-west). There are no coastal water abstraction points within 10km of the proposed development.

4.16.1.2 Other users

Other users of the port would include the cruise ships visiting the terminal (see **Section 4.15.1**) and vessels (of all types and purposes) which visit other companies within the Port of Leith. Cargo vessels are the main user of the Port of Leith, with purposes such as transporting construction materials, aggregate industries, oil and gas related activity, and the transportation of agricultural products for brewing and distillery, and animal feed. There are also other used of the Port of Leith, all of which are managed by the Port of Leith. As discussed in **Section 4.15.1** a small marina is present in Newhaven Harbour adjacent to the Port of Leith, and there are marinas in Granton which support recreational users, which have their own approaches.

4.16.2 Potential impacts

4.16.2.1 During construction

There is no existing infrastructure within the footprint of the proposed development and therefore direct impacts will not occur. Indirect impacts are also considered unlikely due to the distance of these structures from the proposed development.

Potential impacts to other users would relate to navigation only, this has been discussed in **Section 4.15**.

4.16.3 Potential operational impacts

There would be no impact to existing infrastructure during operation of the proposed development. Potential impacts to other users have been discussed in **Section 4.15**.

4.16.4 Summary

There would be no impact to existing infrastructure during the construction and operation of the proposed development. Potential impacts to other users have been discussed in **Section 4.15**.

4.17 Archaeology and Cultural Heritage

4.17.1 Existing Environment

Data to inform a description of the existing environment for archaeology and cultural heritage were downloaded from the Historic Environment Scotland (HES) Historic Environment Portal as GIS shapefiles. These were mapped against a study area comprising the red line boundary plus a 500km buffer in order to identify non-designated historic assets within and in the vicinity of the proposed development. This study

area was widened to 2km in order to identify designated heritage with settings which could be subject to changes associated with the proposed development.

In addition, designated monuments within and across the Firth of Forth, and located at high points within the landscape around Edinburgh, are also discussed with respect to key views and potential settings effects. Key views are identified within the Edinburgh Design Guidance (EDG) (City of Edinburgh Council, 2020) based upon a study of views and skylines undertaken for the Council between 2005 and 2008. This study led to the development of a skyline policy to define which key views should be protected from new development (City of Edinburgh Council, 2008). This policy was subsequently reviewed and updated in 2012 (City of Edinburgh Council, 2012). The key views identified as part of the 2009 skyline study are all available for download from the City of Edinburgh Council website:

- Key Views – North available at: https://www.edinburgh.gov.uk/downloads/download/13261/key-views---north; and,
- Key Views – Centre available at: https://www.edinburgh.gov.uk/downloads/download/13259/key-views---centre.

Reference has been made to these key views where relevant to the setting of historic assets set out below.

Reference is also made to additional information available via Canmore (Scotland's National Record of the Historic Environment (NRHE)), compiled and maintained by HES to provide public access to information on archaeological sites, buildings, industry and maritime heritage across Scotland.

4.17.1.1 World Heritage Sites

There are no World Heritage Sites (WHSs) within the study area, although the northern edge of the Old and New Towns of Edinburgh designated by UNESCO as a WHS in 1995, is located c. 3km to the south west. The Forth Bridge, designated in 2015, is located c. 12.5km to the west of the Port of Leith.

The Outstanding Universal Value (OUV) of the Forth Bridge lies with its status as a "masterpiece of creative genius" and as an "extraordinary and impressive milestone in the evolution of bridge design and construction during the period when railways came to dominate long-distance land travel, innovative in its concept, its use of mild steel, and its enormous scale" (UNESCO, 2015). The view from the western end of Leith Docks towards the Forth Bridge is defined as a key viewpoint (N12b) in the EDG. Views from the bridge itself do not form part of its OUV and this is reflected in the key views defined for the bridge which are all focused towards the bridge rather than from it.

The OUV of the Old and New Towns of Edinburgh is focused upon the "remarkable juxtaposition of two clearly articulated urban planning phenomena. The contrast between the organic medieval Old Town and the planned Georgian New Town of Edinburgh, Scotland, provides a clarity of urban structure unrivalled in Europe" (UNESCO, 1995). There are views from within the world heritage site looking northwards across Leith, from Calton Hill, for example, which include views towards the Port. The Port of Leith features in several of the key views defined in the EDG. Two of these have relevance to the proposed development which are described by the 2009 skyline study as follows:

- C01b: Inchkeith Island from Castle lower ramparts:
  - View: Castle lower ramparts, north side
  - Skyline: falling sight line to the surface of the sea halfway between Port of Leith north breakwater and Inchkeith Island; George Street spire rises above this sightline against distant sea; and.

- Backdrop: Inchkeith Island standing in open water all round; the line of the tops of buildings in front of Inchkeith Island is irregular in height, but the Port of Leith upper skyline keeps lower than the near shore of the island.

- N12b: Castle and Hub spire:
  - View: quay side at west end of development area; a wonderful and unique view made possible by width of water in harbour;
  - Skyline: visible base of Castle walls and bottom of Hub spire; and,
  - Backdrop: roof levels to west of Castle rock from which Castle rises.

4.17.1.2 Scheduled Monuments

There is a single Scheduled Monument within the 500m study area, also located within the proposed laydown area:

- Martello Tower, Leith (SM2418).

This Martello Tower was built on Mussel Cape Rocks in 1809 to defend the entrance to Leith Harbour (Canmore ID 51960). The tower was scheduled in 1964 and survives, half buried within the reclaimed land forming the east breakwater within Forth Ports Ltd land and is not publicly accessible. The heritage significance of this asset primarily lies in its status as one of a number of small defensive forts that were built across the British Empire at the time of the French Revolutionary wars.

There are four further Scheduled Monuments within the 2km study area:

- Edinburgh, Citadel Arch at Johnston Street (SM2993);
- Custom House, hydraulic crane & cabin S of, Albert Dock, Leith (SM3528);
- Leith Links, artillery mounds (SM1195); and,
- Leith, dry dock off Sandport Street (SM5683).

In addition, there are a number of Scheduled Monuments within, and across the Firth of Forth which could have settings which could be impacted by the proposed development, including (but not limited to):

- Charles Hill, Monks' Cave storehouse, military camp and battery (SM5660);
- Braefoot Point, battery (SM7775);
- Inchmickery, fortifications (SM3332);
- Inchkeith Island and fortifications (SM3838);
- Inchcolm, Abbey, hermit's cell, First World War and Second World War defences (SM90166); and,
- Cramond Island, First World War and Second World War defences (SM13684).

Finally, Scheduled Monuments within the city of Edinburgh which have views across the Port of Leith may also have settings which could be affected, including (but not limited to):

- Edinburgh Town Wall, Flodden Wall and Telfer Wall, Heriot Place (SM2901);
- Edinburgh Town Wall, Flodden Wall, Johnston Terrace to Grassmarket (SM3012);
- Edinburgh Town Wall, Flodden Wall, Drummond Street to Pleasance (SM3013);
- Holyrood Park (SM13032);
- Holyrood Abbey, precinct and associated remains (SM13031);
- St Triduana's Aisle,chapel and wellhouse (SM90133); and,
- Edinburgh Castle/Caisteal Dhùn Èideann (SM90130).

As set out above, the view of Inchkeith Island from the Castle lower ramparts is defined as a key view in the EDG (C01b).

4.17.1.3 Listed Buildings

In Scotland, once a building is found to be of special architectural or historic interest, it is then classified under one of three categories according to its relative importance:

- Category A: Buildings of special architectural or historic interest which are outstanding examples of a particular period, style or building type;
- Category B: Buildings of special architectural or historic interest which are major examples of a particular period, style or building type; and,
- Category C: Buildings of special architectural or historic interest which are representative examples of a period, style or building type.

There are no listed buildings within the site, although there are nine within the 500m study area which may have settings which could be affected by the proposed development:

- Victoria Swing Bridge, Leith Docks, Edinburgh Category A (LB27644);
- Albert Dock, Leith Docks, Edinburgh Category B (LB27590);
- Alexandra Dry Dock, Leith Docks, Edinburgh Category B (LB27595);
- Hydraulic Power Station, Alexandra Dry Dock, Leith Docks, Edinburgh Category B (LB27601);
- Imperial Dock Grain Elevator, Leith Docks, Edinburgh Category B (LB27619);
- Prince Of Wales Graving Docks, Leith Docks, Edinburgh Category B (LB27629);
- Prince Of Wales Graving Docks, Leith Docks, Edinburgh Category B (LB27634);
- Hydraulic Station, Prince Of Wales Dry Dock, Leith Docks, Edinburgh Category B (LB27634); and,
- Harbour and Docks Office, Tower Place, Leith Docks Category C (LB27639).

Within the wider 2km study area there are 764 further listed buildings comprising:

- 46 Category A;
- 434 Category B; and,
- 282 Category C.

4.17.1.4 Historic Marine Protected Areas

There are no Historic Marine Protected Areas (HMPA) within the study area.

4.17.1.5 Gardens and Designated Landscapes

Within Edinburgh there are four Gardens or Designated Landscapes which may all have settings incorporating the Port of Leith:

- The New Town Gardens (GDL00367);
- Royal Botanic Garden, Edinburgh (GDL00334);
- Palace of Holyroodhouse (GDL00308); and,
- Dean Cemetery (GDL00135).

4.17.1.6 Conservation Areas

The northern edge of Leith Conservation Area (CA7) falls within the 500m study area, incorporating the area of Albert Dock. The Conservation Area Character Appraisal (City of Edinburgh Council, 2002) defines the character of the Conservation Area as deriving from Leith's history both as a port and an independent burgh and covers the older parts of the Port of Leith, containing many early features including listed dock buildings

and the Victoria Bridge, a Category A Listed Building (LB27644). Although views are predominantly internal, the character appraisal also describes how longer views to and from the Port of Leith and Nelson Monument on Calton Hill relate Leith to the city and to the sea.

Six further Conservation Areas are located wholly or partially within the 2km study area:

- Newhaven (CA5);
- Trinity (CA6);
- Lochend (CA653);
- Victoria Park (CA20);
- Pilrig (CA646); and,
- Hawthornbank Colonies (CA652).

4.17.1.7 Non-Designated Historic Assets (Canmore)

The NRHE maritime records from Canmore comprise records relating to Scotland's marine historic environment, including shipwrecks. There are 38 maritime records within the 500m study area. These are all, however, records of casualties rather than known wrecks (i.e. records of losses which were historically documented at Leith, but for which the actual location of any physical remains is unknown). As these records do not represent actual remains, these provide only an indication of the potential for encountering previously undiscovered remains during works. Although the records indicate a fairly high number of losses, the previous works within the area of the docks, including reclamation and the excavation of the entire area around the lock, means that there would be no potential for discovering *in situ* undisturbed wrecks during works.

There are no aircraft crash sites or reported losses of aircraft within the study area although, similarly, the discovery of isolated finds of aircraft material associated with crash sites may still occur. For example, to the north of the study area within the Firth of Forth, there are two recorded losses of aircraft at a location c. 2.5km west of Inchkeith described as follows:

- A/C HAWKER (BRITISH, HURRICANE I) Ditched off Burntisland in 1941 (Canmore ID 329853); and,
- A/C FAIREY (BRITISH, BARRACUDA II) Crashed into the sea 1 mile west of Inchkeith in 1943 (Canmore ID 328528).

In addition, there are 40 Canmore monument points within the 500m study area. Thirty-nine of these correlate to architectural elements associated with the docks including two of the Scheduled Monuments (the hydraulic crane and cabin SM3528 and Martello Tower SM2418) and a number of records relating to listed structures. For example, ten of the records correspond to various elements of the listed Albert Dock (LB27590).

Only one of the records corresponds to an archaeological discovery, comprising the discovery of a 20th century stone wall and a late 19th century timber jetty during two phases of evaluation in advance of development of land at Ocean Drive (Canmore ID 365145). During both phases of evaluation significant depths of made ground were revealed, with excavation indicating that this made ground extended beyond 3m in depth, although this could not be recorded due to the water level. This indicates that the potential for buried archaeology within the reclaimed areas is limited.

There are no further findspots or records indicating the archaeological potential of the study area. Below the reclaimed areas, and below recently accumulated marine sediments, it is possible that deposits of

prehistoric palaeo-environmental interest may be present although this potential is reduced within the areas of the docks which have been subject to routine dredging.

4.17.2 Potential impacts

4.17.2.1 During construction

Direct (physical) impacts to known historic assets will not occur.

There is a single known historic asset located within the footprint of the proposed development (the Martello Tower Scheduled Monument). The Martello Tower will be preserved *in situ* and protected by fences during construction works to prevent accidental impacts. As no direct changes to the Martello Tower will occur Scheduled Monument Consent will not be required.

Due to the limited groundworks and significant depths of made ground within reclaimed areas direct (physical) impacts to buried archaeology onshore are not anticipated to occur.

Piling, and potential the excavator dredging, may impact sub-surface deposits of potential paleoenvironmental interest in marine areas should these be present, although this potential is anticipated to have been reduced by previous disturbance associated with reclamation, port development activities and routine dredging.

4.17.2.2 During operation

4.17.2.3 Direct (physical) impacts to historic assets

Direct (physical) impacts to known historic assets will not occur.

4.17.2.4 Indirect (physical) impacts to historic assets

As set out in **Section 4.2** above, the anticipated effects of the proposed development on the natural physical environment and sediment transport system are considered to be insignificant. Together with the absence of known historic assets from marine areas, there is no pathway for indirect (physical) impacts to historic assets to occur.

4.17.2.5 Impacts upon the setting of historic assets

As the proposed development does not include provision for any new structures with significant height, and as the new berth, mooring dolphins, walkways, lay down area and associated elements are similar in nature to the current use of the study area, it is not anticipated that the proposed development will result in a material change to the defined key views, to the OUV of the WHSs or to the setting of the Martello Tower.

4.17.3 Summary

Potential impacts to archaeology and cultural heritage during construction and operation of the proposed development are not considered to be significant

4.18 Landscape and Visual Impact

4.18.1 Existing environment

The proposed development is located within an operational port. The proposed development is within an Urban Landscape Character Type (LCT)[21] which encompasses Edinburgh and the coastline from Portobello in the east to Cramond in the west. It is also within the Developed Inner Firths Coastal Character Type[22].

Adjacent to the proposed development is the Western Harbour development which includes residential apartments, a hotel, commercial properties and recreational and fitness facilities. At the end of Western Harbour is the Western Harbour Lighthouse and Lighthouse Park which is open to public access. Residents and visitors to this area will have uninterrupted views of the proposed development across the Western Harbour and approach channel.

Within sight of the proposed development are a number of heritage designations (see **Section 4.17**). The Old and New Towns of Edinburgh and Forth Bridge were designated as a UNESCO World Heritage Site (WHS). The boundary of the Old and New Towns of Edinburgh WHS is approximately 3km to the south of the Port of Leith.

Key views to and from the Old and New Towns of Edinburgh WHS have been identified in a Skyline Policy and incorporated in the Edinburgh Design Guidance 2020[23]. Protected Skyline Views include views of Inchkeith Island from Edinburgh Castle and Blackford Hill, with the Port of Leith in the middle ground and views of Calton Hill, Edinburgh Castle, Arthurs Seat and Forth Bridge from the Port of Leith.

4.18.2 Potential impacts

4.18.2.1 During construction

During construction there would be temporary impacts to the local landscape/coastal character and on views from residential, recreational and commercial areas within the Western Harbour development due to the presence of construction plant and vessels. Standard best practice would be adhered to that would minimise any impacts. Given this and the existing operational port setting, potential impacts to the landscape/coastal character and visual setting during construction would not be significant.

4.18.2.2 During operation

Vessels would be temporarily berthed at the quay during loading/off-loading operations, taking up to 24hrs, and the berth itself would not be discernible from any vantage point at distance from the port. Given the proposed development provides additional port infrastructure within an existing port, there would be no impact on the local landscape / coastal character.

The proposed development is considered to have a beneficial impact on the area's visual setting, through the removal of the Shawcor facility and 'tiding up' of the Eastern Breakwater. The proposed development would connect the Eastern Breakwater to the port by providing a uniform area of hardstanding that flows into the Port of Leith. The tallest components that would be stored on the laydown area would be towers associated with offshore wind farms; however, their presence would be short term, with full assembly taking place immediately prior to being collected and taken offshore to the wind farm development site. Given their narrow cylindrical form, they would quickly become indistinguishable at any distance from the Port of Leith.

[21] *https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland*
[22] *https://www.nature.scot/sites/default/files/2018-05/National%20coastal%20character%20map.pdf*
[23] *https://www.edinburgh.gov.uk/downloads/file/27602/edinburgh-design-guidance-january-2020*

4.18.3 Summary

The proposed development would not affect the local landscape/coastal character. Nor is it anticipated to have a significant impact on the visual setting.

4.19 Tourism and Recreation

4.19.1 Existing environment

The proposed development is within an operational port with no public access. The Port of Leith is marketed as the gateway to Edinburgh for cruise ship passengers, offering marquee facilities to visitors and direct access to the city of Edinburgh, its attractions and the wider area.

The Port of Leith hosts the Royal Yacht Britannia (HMY Britannia) which was Queen Elizabeth II's royal yacht between 1954 and 1997. HMY Britannia is permanently berthed at the Ocean Terminal and is open to tourists.

The neighbouring Western Harbour comprises a mix of residential, retail, leisure and commercial facilities, as well as hotels and serviced apartments. At the end of Western Harbour is Lighthouse Park and the Western Harbour Lighthouse which offers views across the approach to Port of Leith to the East Breakwater and across the Firth of Forth to the island of Inchkeith, and Burntisland and Kinghorn on the northern shore of the Forth.

4.19.2 Potential impacts

Potential impacts to recreational navigation are discussed in **Section 4.15**. No other potential impacts to tourism and recreation are anticipated.

4.20 Waste

4.20.1 Existing environment

4.20.1.1 Waste management at the Port of Leith

Forth Ports Limited update their Port Waste Management Plan every three years to manage the disposal of vessel-generated wastes in an environmentally sustainable and legally correct manner, in accordance with the requirements of the International Convention on the Prevention of Pollution by Ships (MARPOL) 1973/78). The Plan is approved by the Maritime and Coastguard Agency (MCA).

The current maintenance dredging licence for the Port of Leith permits the disposal of up to 130,000 wet tonnes of dredged material per year at the Narrow Deep B (FO038) disposal site (licenced from 2021 to 2024). This material is formed of 76% clay and silt, 23% sand, and 1% pebbles, cobbles, and boulders[24].

4.20.1.2 Offshore disposal sites

There are five licenced offshore disposal sites within the outer Firth of Forth, three are within 10km of the proposed development – Narrow Deep (FO039), Narrow Deep B (FO038) (to the north-east) and Oxcars Main (FO041) (to the north-west).

4.20.2 Potential construction impacts

Potential impacts on waste during construction include:

[24] *https://marine.gov.scot/sites/default/files/application_-_maintenance_dredging_and_sea_deposit-_port_of_leith_-_00009166_redacted.pdf*

- Disposal of up to approximately 100,000m^3 of dredged material; and,
- Generation of typical construction site related waste (e.g. plastics, food, hazardous, demolition waste).

Where possible, dredged material would be used in the construction of the proposed development. Where this is not possible a Best Practicable Environmental Option (BPEO) study will be undertaken to identify the most appropriate disposal option. Given the majority of the material is expected to comprise Diamict (also known as bolder clay), it is anticipated that the material would be required to be disposed of offshore.

Construction waste will be managed using a Site Waste Management Plan (SWMP). Material will be reused on site as much as possible, with landfill waste kept as low as possible.

4.20.3 Potential operational impact

Given the removal of the Shawcor facility, waste generated by the proposed development would likely be lower than that currently generated.

4.20.4 Summary

Construction waste would be managed using standard processes, whilst operational waste is considered to be lower than that generated currently. As such, potential significant impacts to waste are not anticipated.

4.21 Accidents and Disasters

4.21.1 Existing environment

The only disaster risk to the proposed development is associated with flood risk, as the proposed works are located within an area that is theoretically at high risk of coastal and fluvial flooding[25]. Relative sea level rise would increase coastal flood risk.

4.21.2 Potential impacts

Potential impacts from flooding has been discussed in **Section 4.5**. No significant impacts were identified.

4.22 Climate Change

4.22.1 Existing environment

In 2018, total GHG emissions in Scotland were 41.6 Mt CO_2e, of which 12.9 Mt were contributed by transport, 8.4 Mt by business activity and 1.9 Mt by aviation and shipping. Within the CEC area, total CO_2 emissions in 2018 were 3.27 Mt[26,27]. As discussed in **Section 1.1**, Scotland has pledged to reduce its GHG emissions by 75% by 2030 and to be net-zero by 2045. The ScotWind process will mean more wind farm projects in the future, and a part of that process includes the commitment to 25% of the OWF industry being local.

In the context of GHG emissions, then the receptor is effectively the global atmosphere. With regard to climate resilience, the receptor is the proposed development itself, together with its ancillary infrastructure.

[25] *https://map.sepa.org.uk/floodmaps*
[26] *https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018*

[27] *https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019*

4.22.2 Potential impacts

The function of the proposed berth facility is to provide logistical support to the ScotWind Round 4 initiative, with the aim of achieving construction and operation of an additional 8 – 10 GW of offshore wind electrical generation capacity. It is, therefore, intimately entwined in the zero-carbon electricity production industry and associated GHG emissions should, therefore, be interpreted and viewed in that specific context[28].

An assessment will be conducted of the embedded and other GHG emissions generated during the construction and operation of the facility and these will be evaluated in the context of the overall outcome project boundaries of offshore wind electricity generation. In general, GHG emissions generated by the construction and operation of offshore wind farms are effectively "neutralised" in the early years of the operation of a project, with the remaining years of electricity production being effectively zero-carbon. Emissions associated with the proposed development will be assessed in this context and mitigation measures applied accordingly.

4.22.3 Climate resilience

The design approach and procedures applied for the proposed development will result in an ultimate design that will cater for resilience to future changes in climate-related coastal variables, based upon conservative assumptions about future changes.

4.22.4 Summary

Given that the purpose of the proposed development is to service the ScotWind Round 4 (and beyond) renewable energy generation initiative, which itself is central to decarbonisation of the Scottish economy, it is concluded that any GHG emissions associated with the project would be subsumed into the overall carbon accounting of the offshore wind generation.

Similarly, climate resilience of the project would be designed into its construction and operation and would therefore not be significant.

4.23 Socio-economics

4.23.1 Existing environment

The Port of Leith is surrounded by mixed use development comprising retail, leisure and commercial offices primarily around Western Harbour, Ocean Terminal, the Victoria Quay office complex and Ocean Point office building. To the south and east there is extensive residential development, interspersed with this retail, leisure, and commercial accommodation.

4.23.2 Potential impacts

4.23.2.1 During construction

Potential impacts on socio-economics during construction include:

- Temporary construction jobs; and,
- Multiplier and supply chain effects at both a local and regional level.

[28] https://www.pure.ed.ac.uk/ws/portalfiles/portal/19730442/Main_Report_Life_Cycle_Costs_and_Carbon_Emissions_of_Offshore_Wind_Power.pdf

4.23.2.2 During operation

During operation it is likely that employment impacts and the economic benefits from the proposed development will be significant for the long term operational period, which is expected to generate significant numbers of well-paid permanent job and career opportunities in a number of activities related to the key target economic sectors of the offshore and marine energy industries. In addition, indirect and induced employment opportunities are also anticipated to be created as a result of the proposed development.

4.23.3 Summary

The proposed development is considered to have a significant beneficial impact on local and regional socio-economy.

5 EIA Screening Conclusion

The proposed development is considered to be a Schedule 2 EIA development, falling under Schedule 2 10(g) of the EIA Regulations, as:

construction of harbours Construction of harbours and port installations, including fishing harbours (unless included in schedule 1)

The potential impacts of the proposed development have therefore been assessed in accordance with the criteria set out in Schedule 3 of the EIA Regulations, and are concluded as follows:

- The proposed development would have a significant beneficial impact on the local and regional socio-economy, through the provision of significant numbers of well-paid permanent jobs and career opportunities, as well as indirect and induced employment opportunities.
- Beneficial impacts on the surrounding environment have been identified as a result of the proposed decommissioning of the existing Shawcor facility, which is a current source of air and noise emissions, as well as having a negative visual appearance, when compared to the proposed development. The use of the area as a laydown for the offshore renewables industry, would comprise a uniform stone surface and utilise more quiet modern equipment.
- Potential impacts to ornithology, marine mammals and fish during construction would be managed effectively using current best practice construction methodology and industry standard mitigation measures. No other potentially significant impacts have been identified during construction.
- No significant impacts are expected during operation of the proposed development from noise or emissions to air. In addition, the provision of cutting-edge technology, such as shore power, would reduce the need for vessels to be 'idling' at the berth with engines running while transhipments are taking place, therefore reducing noise and emissions to air.
- The tallest components that would be stored on the laydown area would be towers associated with offshore wind farms; however, their presence would be short term, with full assembly taking place immediately prior to being collected and taken offshore to the wind farm development site. Given their narrow cylindrical form, they would quickly become indistinguishable at any distance from the Port of Leith. As such, there would be no significant impact to the local landscape character and visual setting during operation.
- The Port of Leith already accepts vessels of a similar size to those that support the offshore renewables industry, in terms of length and height, it is just the wider beam width that prevents these vessels from being able to access the lock. As such, the ability for the Port of Leith to accept these vessels is not consider to represent a change to the existing situation.

Given the beneficial impacts that have been identified and the limited potential for the proposed development to result in significant environmental impacts, which can be managed using best practice construction

methodology and industry standard mitigation measures, it has been concluded by Forth Ports Limited and their advisors that **the Proposed Development does not require an EIA** under the Marine Works (EIA) (Scotland) Regulations 2017 (as amended) or The Town and Country Planning (EIA) (Scotland) Regulations 2017 (as amended).

Screening Opinions are requested from CEC and Marine Scotland to confirm that an EIA is not required.

6 References

Arso Civil, M., Quick, N.J., Cheney, B., Pirotta, E., Thompson, P.M. and Hammond, P.S. (2019). Changing distribution of the east coast of Scotland bottlenose dolphin population and the challenges of area-based management. Aquatic Conservation: Marine and Freshwater Ecosystems, 29, pp.178-196.

Beard, T. W. and McGregor, D., (2004). Storage and care of live lobsters. Laboratory Leaflet Number 66 (Revised) Cefas, Lowestoft, 2004. Available online from: http://www.cefas.co.uk/publications/lableaflets/lableaflet66rev.pdf

Bennett, T.L. and McLeod, C.R., (1998). East Scotland (Duncansby Head to Dunbar) (MNCR Sector 4). In Hiscock, K. (ed) Marine Nature Conservation Review. Benthic marine ecosystems of Great Britain and the north-east Atlantic. Peterborough, Joint Nature Conservation Committee. (Coasts and seas of the United Kingdom. MNCR series.). pp 123–154.

British Geological Survey. (1986). Tay-Forth. Sheet 56oN-04oW (including part of Borders Sheet 55oN-04oW). 1:250 000 Series. Sea Bed Sediments.

Carter, M.I., Boehme, L., Duck, C.D., Grecian, J., Hastie, G.D., McConnell, B.J., Miller, D.L., Morris, C., Moss, S., Thompson, D. and Thompson, P., (2020). Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles: Report to BEIS, OESEA-16-76, OESEA-17-78.

CEC (2020) 2020 Air Quality Annual Progress Report (APR) for The City of Edinburgh Council. Available from: https://www.edinburgh.gov.uk/downloads/file/28720/laqm-annual-progress-report-2020

CEC (2020) Edinburgh Design Guidance. Available from: https://www.edinburgh.gov.uk/downloads/file/27602/edinburgh-design-guidance-january-2020

CEC (2002) Leith Conservation Area Character Appraisal. Available at: https://www.edinburgh.gov.uk/downloads/file/23383/leith-conservation-area-character-appraisal

CEC (2008) Skyline Report: The Projection of Key Views. Available at: https://democracy.edinburgh.gov.uk/Data/Planning%20Committee/20080619/Agenda/skyline_report_-_the_protection_of_key_views.pdf

CEC (2012) Guidance for the Protection of Key Views. Available at: https://democracy.edinburgh.gov.uk/Data/Planning%20Committee/20120809/Agenda/item_12_guidance_protection_of_key_views.pdf

Coull, K. A., Johnstone, R and Rogers, S. I., (1998). Fishery sensitivity Maps in British Waters. Published and distributed by UKOOA Ltd. Available online from: http://cefas.defra.gov.uk/media/29947/sensi_maps.pdf

DECC (now Department for Business, Energy and Industrial Strategy) (2016). UK Offshore Energy Strategic Environmental Assessment 3 (OESEA3).

EDF Energy (2020). The Sizewell C Project, Volume 2 Main Development Site, Chapter 22 Marine Ecology and Fisheries, Appendix 22L - Underwater Noise Effects Assessment for Sizewell C: Edition 2. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010012/EN010012-001947-

SZC_Bk6_%20ES_V2_Ch22_Marine_Ecology_Appx22L_Underwater_Noise_Effects_Assessment.pdf

Ellis, J. R., Milligan, S. P., Readdy, L., Taylor, N. and Brown, M.J., (2012). Spawning and Nursery Grounds of Selected Fish Species in UK waters. Sci. Ser. Tech. Rep., Cefas, Lowestoft, 147: 56 pp.

ERM (Environmental Resources Management). (2021). Port of Leith Maintenance Dredge Disposal: Marine Licence Application. Best Practicable Environmental Option, February 2021.

Forth Port Properties Ltd, (2007). Outline Planning Application for Leith Docks: Environmental Statement. Produced by Ove Arup and Partners, 21 August 2007.

Furness, R., (2015). Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report 164.

Global Energy Group (2019) Nigg East Quay Environmental Impact Assessment Report Technical Appendix 4.2 Underwater Noise Assessment Nigg East Quay. https://marine.gov.scot/sites/default/files/eia_volume_3_-_technical_appendices_redacted_redacted.pdf

Hague, E.L., Sinclair, R.R. and Sparling, C.E. (2020) Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters. Scottish Marine and Freshwater Science.

Historic Environment Scotland (2016) Managing Change in the Historic Environment: Setting. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationid=80b7c0a0-584b-4625-b1fd-a60b009c2549

Historic Environment Scotland (2018) Scheduled Monument Consents Policy. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=46d8502d-7059-416b-940e-aa250102112d

IAQM (2014) Guidance on the assessment of dust from demolition and construction. Available from: https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf

IAQM (2017) Land-Use Planning & Development Control: Planning For Air Quality. Available from: http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

Jacobs Arup. (2009). Forth Replacement Crossing. DMRB Stage 3 Environmental Statement. Appendix A9.1: Hydrodynamic Modelling.

Jayamanne, S.C., (1995). Population dynamics, biology and ecology of the caridean shrimps Crangon crangon Linneaus, Crangon allmanni Kinahan and Pandalus montagui Leach in the estuary and Firth of forth, Scotland. PhD Thesis, University of Sterling. Available online from: https://dspace.stir.ac.uk/handle/1893/2173?mode=full&submit_simple=Show+full+item+record

Jennings, G., McGlashan, D.J. and Furness, R.W., (2012). Responses to changes in sprat abundance of common tern breeding numbers at 12 colonies in the Firth of Forth, east Scotland. ICES journal of marine science, 69(4), pp.572-577. Available online from: https://www.researchgate.net/profile/Robert-Furness/publication/275147380_Responses_to_changes_in_sprat_abundance_of_common_tern_breeding_numbers_at_12_colonies_in_the_Firth_of_Forth_east_Scotland/links/56422e4408aebaaea1f8c6d2/Responses-to-changes-in-sprat-abundance-of-common-tern-breeding-numbers-at-12-colonies-in-the-Firth-of-Forth-east-Scotland.pdf

Malcolm, I. A., Godfrey, J. and Youngson, A. F., (2010). Review of migratory routes and behaviour of Atlantic Salmon, sea trout and European eel in Scotland's coastal environment: implications for the development of marine renewables. Scottish Marine and Freshwater Science, 1, 14.
Marine Scotland (2013) ScotMap - Inshore Fisheries Mapping Project in Scotland. Available at: http://marine.gov.scot/information/scotmap-inshore-fisheries-mapping-project-scotland. Accessed on 09/06/2021

New Acoustics (2019) Western Harbour Development, Edinburgh – Noise Impact Assessment. Available from: http://citydev-portal.edinburgh.gov.uk/idoxpa-web/files/2B355E81EC1D98C8099FEB93C2F69B2B/pdf/20_03225_PPP-NOISE_ASSESSMENT-4804852.pdf

NIEA, DAERA, SEPA & NRW (2018) Guidance for Pollution Prevention Works and maintenance in or near water: GPP 5. Available from: https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm_source=website&utm_medium=social&utm_campaign=GPP5%2027112017

NMFS (2018). 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts.

Paxton, C.G.M., Scott-Hayward, L., Mackenzie, M., Rexstad, E. and Thomas, L. (2016). Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resources with Advisory Note, JNCC Report 517, ISSN 0963-8091: http://jncc.defra.gov.uk/page-7201

PD Teesport. (2018) Hartepool Approach Channel EIA Report: Appendix 8 Underwater noise baseline survey report and modelling report.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B. and Løkkeborg, S., (2014). ASA S3/SC1. 4 TR-2014 Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-Accredited standards committee S3/SC1 and registered with ANSI. Springer.

Port of Cromarty Firth Ltd. (2018). Appendix G: Underwater Acoustics: Underwater noise propagation modelling at Port of Cromarty Firth, Invergordon, Scotland.

Robson, C. F., (1997). Chapter 5 - Important Species IN: Barne, J. H., Robson, C. F., Kaznowska, S. S., Doody, J. P., Davidson, N. C. and Buck, A. L., eds. Coasts and Seas of the United Kingdom. Region 4: South-east Scotland: Montrose to Eyemouth. Peterborough JNCC (Coastal Directories Series).

Royal HaskoningDHV (2021). Leith Outer Berth Habitats Regulations Appraisal Stage 1: Screening. A report for Forth Ports Limited

SCOS (2020) Scientific Advice on Matters Related to the Management of Seal Populations: 2020. Available from: http://www.smru.st-andrews.ac.uk/files/2021/06/SCOS-2020.pdf

SKM, (2011). Leith Renewable Energy Plan Environmental Impact Assessment. Report for Forth Energy, January 2011. Reference 0127411.1, March 2011.

SKM (2012) Port of Leith: 21st Century Gateway Port. Request for EIA Scoping Opinion, September 2012. Available from: https://marine.gov.scot/sites/default/files/port_of_leith_-_scoping_request_redacted.pdf

SNH (2019) HRA on the Firth of Forth – A Guide for Developers and Regulators. Available from: https://www.nature.scot/sites/default/files/2019-07/Habitats%20Regulations%20Appraisal%20%28HRA%29%20on%20the%20Firth%20of%20Forth%20-%20A%20Guide%20for%20developers%20and%20regulators_1.pdf

Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P. and Tyack, P.L., (2019). Marine mammal noise exposure criteria: updated scientific recommendations for residual hearing effects.

UNESCO (1995) Old and New Towns of Edinburgh World Heritage List Entry. Available at: https://whc.unesco.org/en/list/728/

UNESCO (2015) The Forth Bridge World Heritage List Entry. Available at: https://whc.unesco.org/en/list/1485

University of Edinburgh (2015) Life Cycle Costs and Carbon Emissions of Offshore Wind Power. Available from: https://www.pure.ed.ac.uk/ws/portalfiles/portal/19730442/Main_Report_Life_Cycle_Costs_and_Carbon_Emissions_of_Offshore_Wind_Power.pdf

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. and Felce, T., (2020). Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), pp.253-269.