

REPORT

Leith Outer Berth: Habitats Regulations Appraisal

Stage 1: Screening

Client: Forth Ports Limited

Reference: PC2045-ZZ-XX-RP-Z-0001

Status: S0/P01.05

Date: 05 November 2021



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**

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Author(s): Gemma Starmore, Helen Riley

Drafted by: Gemma Starmore, Helen Riley

Checked by: Dr Rob Iredale, Dr Jennifer Learmonth

Date: 21/06/2021, 25/06/2021

Approved by: Jamie Gardiner

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Table of Contents

1	Introduction	1
1.1	Background to the Project	1
1.2	Purpose of this Report	1
2	Habitats Regulations Appraisal	3
2.1	Legislation	3
2.2	The HRA Process	4
3	The Proposed Development	7
3.1	Summary of the Proposed Development	7
3.2	Construction Phase	7
3.3	Operational Phase	10
3.4	Potential Environmental Effects	14
4	Stage 1: Screening	14
4.1	Approach to Screening	14
4.2	Alone Assessment	17
4.3	In-combination Assessment	37
5	Conclusion of the Screening Assessment	47
5.1	Conclusion of Screening for LSE	47
5.2	Approach to Providing Information for Appropriate Assessment	47
6	References	49

Table of Tables

Table 4-1 Alone Screening for LSE on fish species of the River Teith SAC	18
Table 4-2 Summary of the Outer Firth of Forth and St Andrews Bay Complex SPA designated species and Conservation Objectives	19
Table 4-3 Summary of the Firth of Forth SPA and Ramsar site designated species and Conservation Objectives	20
Table 4-4 Summary of the Imperial Dock Lock, SPA designated species and Conservation Objectives	20
Table 4-5 Summary of the Forth Islands SPA designated species and Conservation Objectives	21
Table 4-6 High Tide Counts of SPA qualifying species at Water of Leith - Ocean Drive to Western Harbour (WeBS Core Count Sector 83440). Darker blue shading indicates SPA species recorded on site and peak monthly counts.	24
Table 4-7 High Tide Counts of SPA qualifying species at Seafield to Eastern Breakwater (WeBS Core Count Sector 83441). Darker blue shading indicates SPA species recorded on site and peak monthly counts.	26

Table 4-8 Peak counts of qualifying species of the Outer Firth of Forth and St Andrews Bay Complex SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA populations (Nature Scot 2020, SNH and JNCC 2016). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population 29

Table 4-9 Peak counts of qualifying species of the Firth of Forth SPA and Ramsar site at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation populations (SNH 2001) and the most recent 5 year mean peak counts for the Forth Estuary (Frost et al. 2021). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population 30

Table 4-10 Peak counts of qualifying species of the Imperial Dock Lock Leith SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation population (SNH 2004) and updated estimates (Furness 2015). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population 30

Table 4-11 Peak counts of qualifying species of the Forth Islands SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation populations (SNH 2018b) and updated estimates (Furness 2015). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population 31

Table 4-12 Potential effects of the proposed development on SPA Qualifying Bird Species 31

Table 4-13 Alone Screening for LSE on qualifying features of the SPAs and Ramsar site 32

Table 4-14 Alone Screening for LSE on marine mammal qualifying features of the SACs 36

Table 4-15 Projects with the potential for in-combination effects with the proposed development 37

Table 4-16 In combination Screening for LSE of designated sites (and features) 40

Table 5-1 Summary of screening for LSE 47

Table of Figures

Figure 1-1 Leith Outer Berth and Lay Down Area 2

Figure 3-1 Indicative drawing of the outer berth 8

Figure 3-2 Indicative drawing of the outer and hardstanding area (red start denotes approximate location of lock drainage outlet) 9

Figure 4-1 Designated sites screened into the HRA 16

Figure 4-2 WeBS count sectors 23

Table of Plates

Plate 2-1 The HRA Process (SNH, 2014) 6

Plate 3-1 Current use of the Port and storage area 12

Plate 3-2 Proposed development once constructed 12

Plate 3-3 Example use of the outer berth and laydown area 13

Plate 3-4 Example loading of offshore renewables vessel when berthed 13

Acronyms

Acronym	Acronym description
AEol	Adverse Effect on site Integrity
cSAC	Candidate Special Areas of Conservation
CI	Confidence Interval
EC	European Commission
EIA	Environmental Impact Assessment
EU	European Union
HRA	Habitats Regulations Appraisal
IROPI	Imperative reasons of overriding public interest
LSE	Likely Significant Effect
NSN	National Site Network
OWF	Offshore Wind Farm
pSAC	Possible Special Areas of Conservation
pSPA	Potential Special Protection Area
SNH	Scottish Natural Heritage
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SPMT	Self-Propelled Modular Transporter
UK	United Kingdom
WeBS	Wetland Bird Survey
WTG	wind turbine generator

Executive Summary

This report documents Stage 1 of the Habitats Regulations Appraisal (HRA) process. The aim of Stage 1 is to determine whether or not a plan or project is likely to have a significant effect (Likely Significant Effect (LSE)) on the qualifying features and Conservation Objectives of a National Site Network (NSN) site or Ramsar site, either alone or in-combination with other plans and projects. Where it is considered that there is no potential for LSE, the site (or relevant interest feature) is 'screened out' from further consideration in the HRA process. Where the potential for LSE cannot be discounted, it is 'screened in' and further assessment is required as part of subsequent stages of the HRA process. It has been issued to NatureScot to confirm the findings of the Stage 1 assessment.

Based on the HRA guidance specifically developed for the Firth of Forth area and consultation with NatureScot, the following designated sites have been considered within the Stage 1 assessment:

- **Outer Firth of Forth and St Andrews Bay Complex SPA** - 0km from the proposed development.
- **Firth of Forth SPA and Ramsar site** - 0km from the proposed development.
- **Imperial Dock Lock, Leith SPA** - Less than 1km from the proposed development.
- **Forth Islands SPA** - Approximately 4km from the proposed development.
- **River Teith SAC** - Approximately 49km from the proposed development, screened in for long-ranging or migratory species only.
- **Isle of May SAC** - Approximately 43km from the proposed development, screened in for long-ranging or migratory species only.
- **Firth of Tay and Eden Estuary SAC** - Approximately 64km from the proposed development, screened in for long-ranging or migratory species only.
- **Berwickshire and North Northumberland Coast SAC** - Approximately 63km from the proposed development, screened in for long-ranging or migratory species only.
- **Moray Firth SAC** - Approximately 300km from the proposed development, screened in for long-ranging or migratory species only.

The table below summarises the sites and features where a LSE has been concluded and therefore would be the subject of the next stage of the HRA process (appropriate assessment).

Designated Site	Feature
River Teith SAC	<ul style="list-style-type: none"> • sea lamprey, river lamprey, and Atlantic salmon
Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> • common tern, eider, and red-throated diver • waterfowl assemblage • breeding seabird assemblage • non-breeding seabird assemblage
Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> • pink-footed goose, red-throated diver, redshank, sandwich tern, and turnstone • waterfowl assemblage
Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> • common tern
Forth Islands SPA	<ul style="list-style-type: none"> • common tern, lesser black-backed gull, sandwich tern, and shag • breeding seabird assemblage
Isle of May SAC	<ul style="list-style-type: none"> • grey seal
Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> • harbour seal
Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> • grey seal
Moray Firth SAC	<ul style="list-style-type: none"> • bottlenose dolphin

1 Introduction

1.1 Background to the Project

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 2045¹. 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 local². 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, due to its central location for projects within the northern North Sea.

The lock gates at the Port of Leith currently restrict access for vessels with a beam (width) of over 30m. Forth Ports Ltd. is therefore proposing to improve a 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:

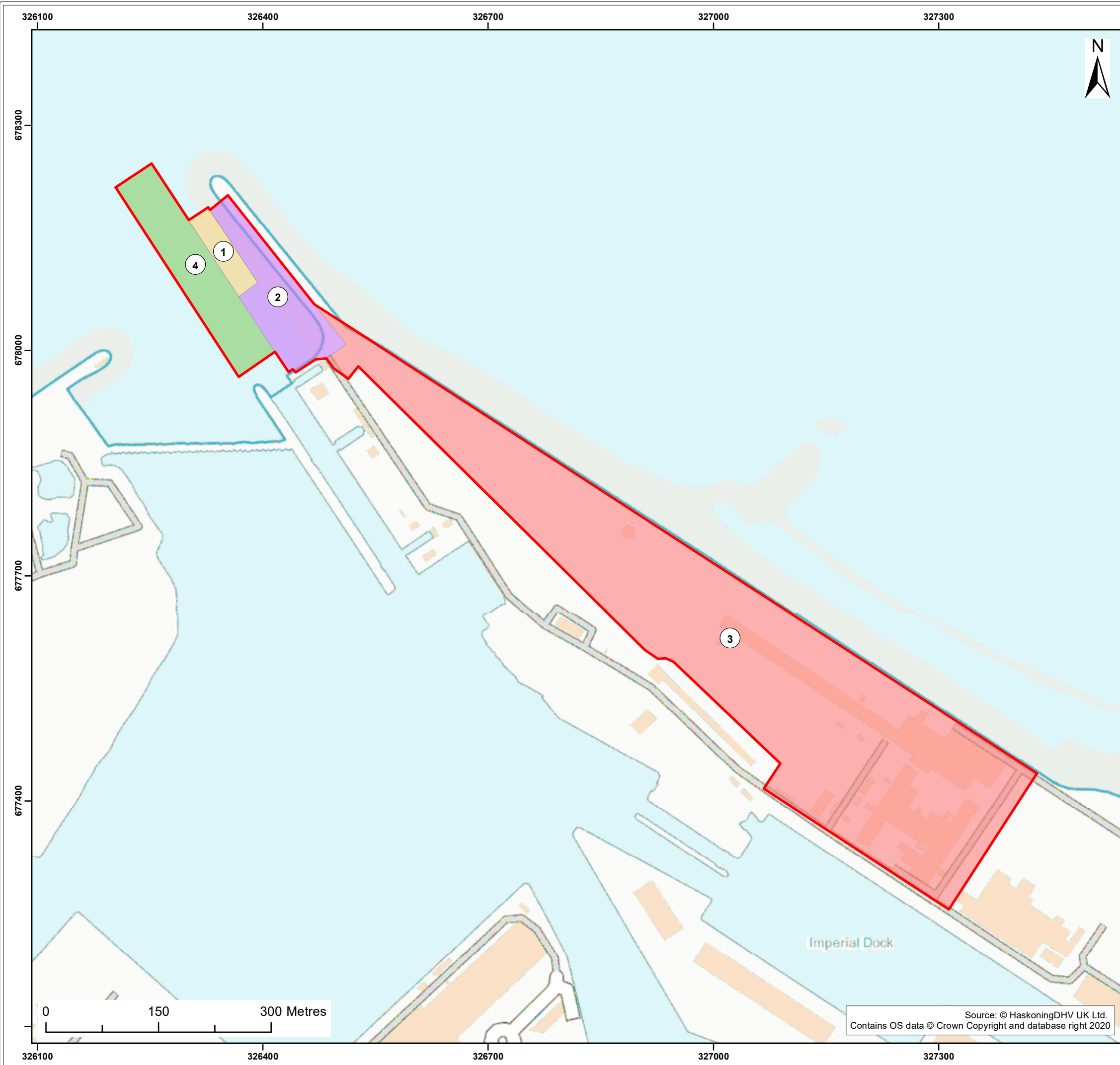
- Improvements to a 120m section of existing berth (Area 1 as shown on **Figure 1-1**);
- An area of hardstanding to be used for loading/unloading (Area 2 as shown on **Figure 1-1**);
- Space for a reconfigured laydown area within the existing port to be used for the storage and transhipment of cargo, most likely 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 documents Stage 1 of the Habitats Regulations Appraisal (HRA) process. The aim of Stage 1 is to determine whether or not a plan or project is likely to have a significant effect (Likely Significant Effect (LSE)) on the qualifying features and Conservation Objectives of a National Site Network (NSN) site or Ramsar site, either alone or in-combination with other plans and projects. Where it is considered that there is no potential for LSE, the site (or relevant interest feature) is 'screened out' from further consideration in the HRA process. Where the potential for LSE cannot be discounted, it is 'screened in' and further assessment is required as part of subsequent stages of the HRA process.

¹ <https://www.gov.scot/policies/climate-change/reducing-emissions/>

² <https://www.crownstatescotland.com/resources/documents/supply-chain-development-statement-summary-1>



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
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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 Habitats Regulations Appraisal

2.1 Legislation

The HRA process covers those sites designated under the European Council Directive 2009/147/EC on the conservation of wild birds (the '*Birds Directive*') and Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the '*Habitats Directive*'). The UK also has to meet its obligations under relevant international agreements such as the Ramsar Convention.

The UK exited the EU on 31st January 2020; however, the application of the HRA process remains largely unchanged due to the introduction of the EU Exit Regulations 2019.

2.1.1 International Legislation

2.1.1.1 The Ramsar Convention

The Convention on Wetlands of International Importance especially as Waterfowl Habitat, as amended in 1982 and 1987 (the '*Ramsar Convention*') is an international treaty for the conservation and sustainable use of wetlands of international importance. Ramsar site selection has had an emphasis on wetlands of importance to waterbirds, however non-bird features are increasingly taken into account, both in the selection of new sites and when reviewing existing sites. The UK government and the devolved administrations have issued policy statements relating to Ramsar sites which extend to them the same protection at a policy level as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Ramsar sites are therefore included in the HRA process.

2.1.2 European Legislation

2.1.2.1 The Birds Directive

The Birds Directive provides a framework for the conservation and management of wild birds in Europe. The relevant provisions of the Birds Directive are the identification and classification of SPAs for rare or vulnerable species listed in Annex I of the Directive and for all regularly occurring migratory species (required by Article 4). The Directive requires national Governments to establish SPAs and to have in place mechanisms to protect and manage them. The SPA protection procedures originally set out in Article 4 of the Birds Directive have been replaced by the Article 6 provisions of the Habitats Directive.

2.1.2.2 The Habitats Directive

The Habitats Directive provides a framework for the conservation and management of natural habitats, wild fauna (except birds) and flora in Europe. Its aim is to maintain or restore natural habitats and wild species at a favourable conservation status. The relevant provisions of the Directive are the identification and classification of SAC (Article 4), and procedures for the protection of SACs and SPAs (Article 6). SACs are identified based on the presence of natural habitat types listed in Annex I and populations of the species listed in Annex II. The Directive requires national Governments to establish SACs and to have in place mechanisms to protect and manage them.

2.1.3 National Legislation

2.1.3.1 Conservation (Natural Habitats, &c.) Regulations 1994, as amended

In Scotland, the Habitats Directive is translated into specific legal obligations by the Conservation (Natural Habitats, &c.) Regulations 1994, as amended. These regulations (hereafter the '*Habitats Regulations*') transpose the Habitats and Birds Directives into Scottish legislation.

The Habitats Regulations place an obligation on ‘competent authorities’ to carry out an appropriate assessment of any proposal likely to affect a designated site, to seek advice from NatureScot and not to approve an application that would have an adverse effect on a designated site unless certain conditions are met (where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured).

2.2 The HRA Process

In accordance with the Habitats Regulations, Appropriate Assessment is required for any plan or project, not connected with the management of a site within the NSN, which is likely to have a significant effect on the site, either alone, or in-combination with other plans and projects.

This report provides the information to support a HRA Screening for LSE for the proposed outer berth at Leith. Specifically, it sets out the following:

- An overview of the HRA process;
- The designated sites considered relevant to the HRA;
- The qualifying features and conservation objectives of the relevant designated sites;
- Identification of pathways and impacts considered; and,
- Screening of potential effects.

The HRA process helps meet the requirements of Article 6(3) of the Habitats Directive which states that any plan or project, that is not directly connected with or necessary to the management of a designated site, but would be likely to have a significant effect (LSE) on such a site, either on its own or in-combination with other plans or projects, will be subject to an appropriate assessment of its implications for the site in view of its conservation objectives.

According to the Waddenzee judgement (Judgement of 7.9.2004 – Case C-127/02), an appropriate assessment will be required if a LSE cannot be excluded on the basis of objective information. The Sweetman Opinion (Opinion of Advocate General 22.10.2012 – Case C-258/11) states that the question is simply whether the plan or project concerned is capable of having an effect.

2.2.1 Stages of HRA

The HRA process (in its entirety) follows a four-staged approach, as detailed in SNHs Natura Casework Guidance (SNH, 2014), which is described further below and in **Plate 2-1**.

1. **What is the plan or project:** to establish whether there is sufficient information on the plan or project (location, extent, timings).
2. **Is the plan or project directly connected with or necessary to site management for nature conservation:** works which are clearly necessary to the management of the site, or that provide value to the site are not required to undertake further assessment.
3. **Is the plan or project likely to have a significant effect (this report):** The process of identifying potentially relevant designated sites, and whether the proposed development is likely to have a significant effect on the qualifying features of the site, either alone or in-combination with other plans and projects. If it is concluded at this stage that there is no potential for LSE, there is no requirement to carry out subsequent stages of the HRA.
4. **Undertake an Appropriate Assessment:** Where a LSE for a designated site(s) cannot be ruled out, either alone or in-combination with other plans and projects, assessment of the potential effects on the integrity of the site(s), again either alone or in-combination with other plans and projects, in view of its qualifying features and conservation objectives is required. Where an adverse effect on integrity cannot be excluded, an assessment of mitigation options is carried out and mitigation

measures (where available) are proposed to address the effects. If, after taking account of mitigation, an adverse effect on integrity cannot be excluded, the HRA must progress to Stages 3 and 4.

5. **Can it be ascertained that the plan or project will not adversely affect site integrity:** the appropriate authority must decide if the plan or project in question will or will not adversely affect the integrity of the site/s.
6. **Are there Alternative Solutions:** Identifying and examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on the site(s).
7. **Would a priority habitat or species be adversely affected:** priority habitats and species are afforded a greater level of protection under the Regulations, this stage determines whether Stage 8 or Stage 9 should be undertaken.
8. **Are there Imperative reasons of overriding public interest (IROPI) (non-priority habitats and/or species):** Where no alternative solution exists, the next stage of the process is to assess whether the development is necessary for IROPI and, if so, the identification of compensatory measures needed to maintain the overall coherence of the designated site network.
9. **Are there IROPI (priority habitats and/or species):** as above, for priority habitats and/or species, where there are *exceptional* health, safety, or environmental benefits, or other reasons for IROPI.

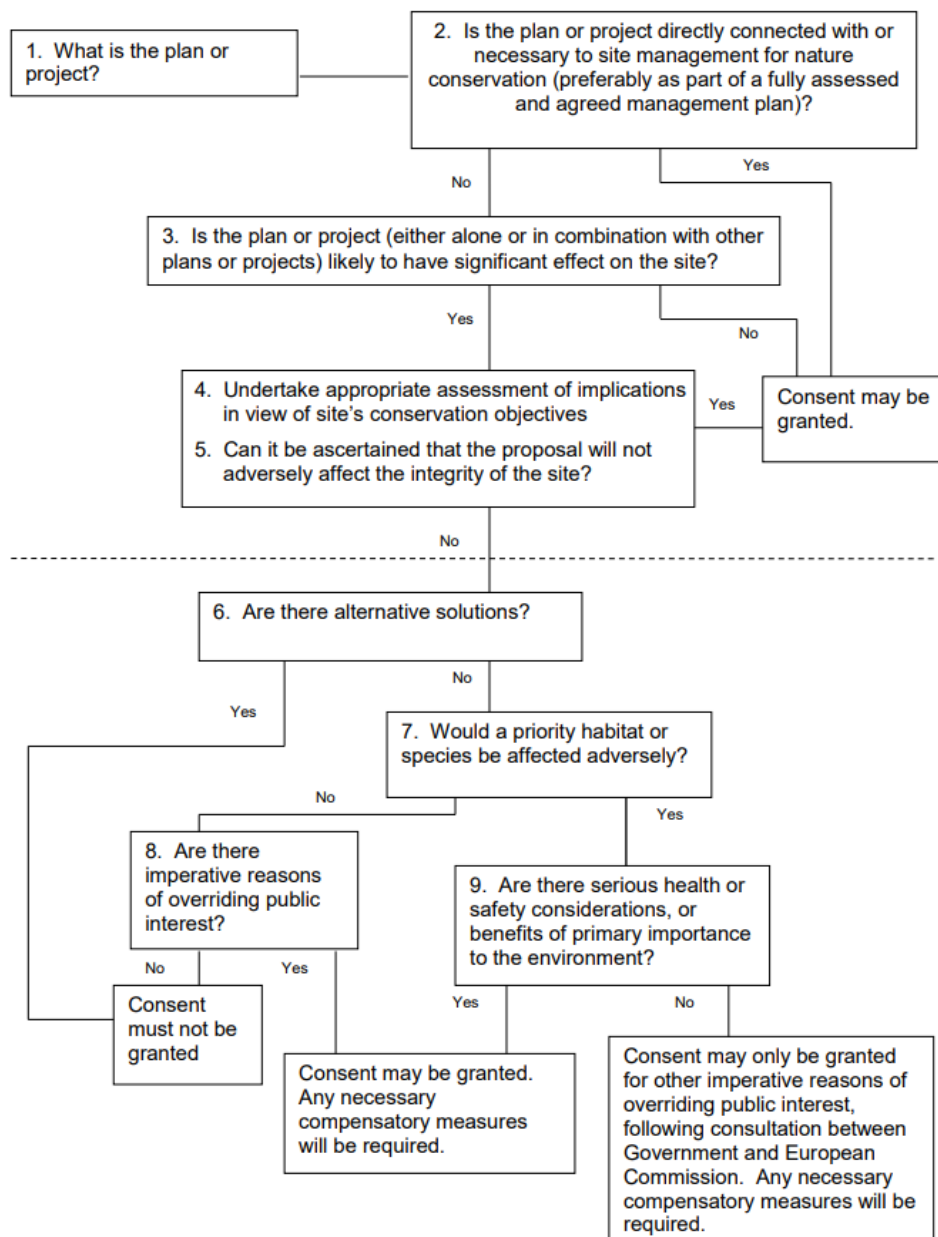


Plate 2-1 The HRA Process (SNH, 2014)

2.2.2 Types of Designated Sites included in HRA

The classes of designations considered by HRA are:

- Ramsar sites;
- SPAs;
- Potential SPAs (pSPAs) – SPAs that are approved by the UK Government but are still in the process of being classified;
- SACs;
- Possible SACs (pSACs) – a site which has been identified and approved to go out to formal consultation; and,
- Candidate SACs (cSACs) – following consultation on a pSAC, the site is submitted to the European Commission (EC) for designation and at this stage it becomes a cSAC.

3 The Proposed Development

3.1 Summary of the Proposed Development

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

- Improvements to a 120m long 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.

3.2 Construction Phase

3.2.1 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 5,500m³ of rock armour and 3,300m³ of underlayer rock, subject to completion of the design.

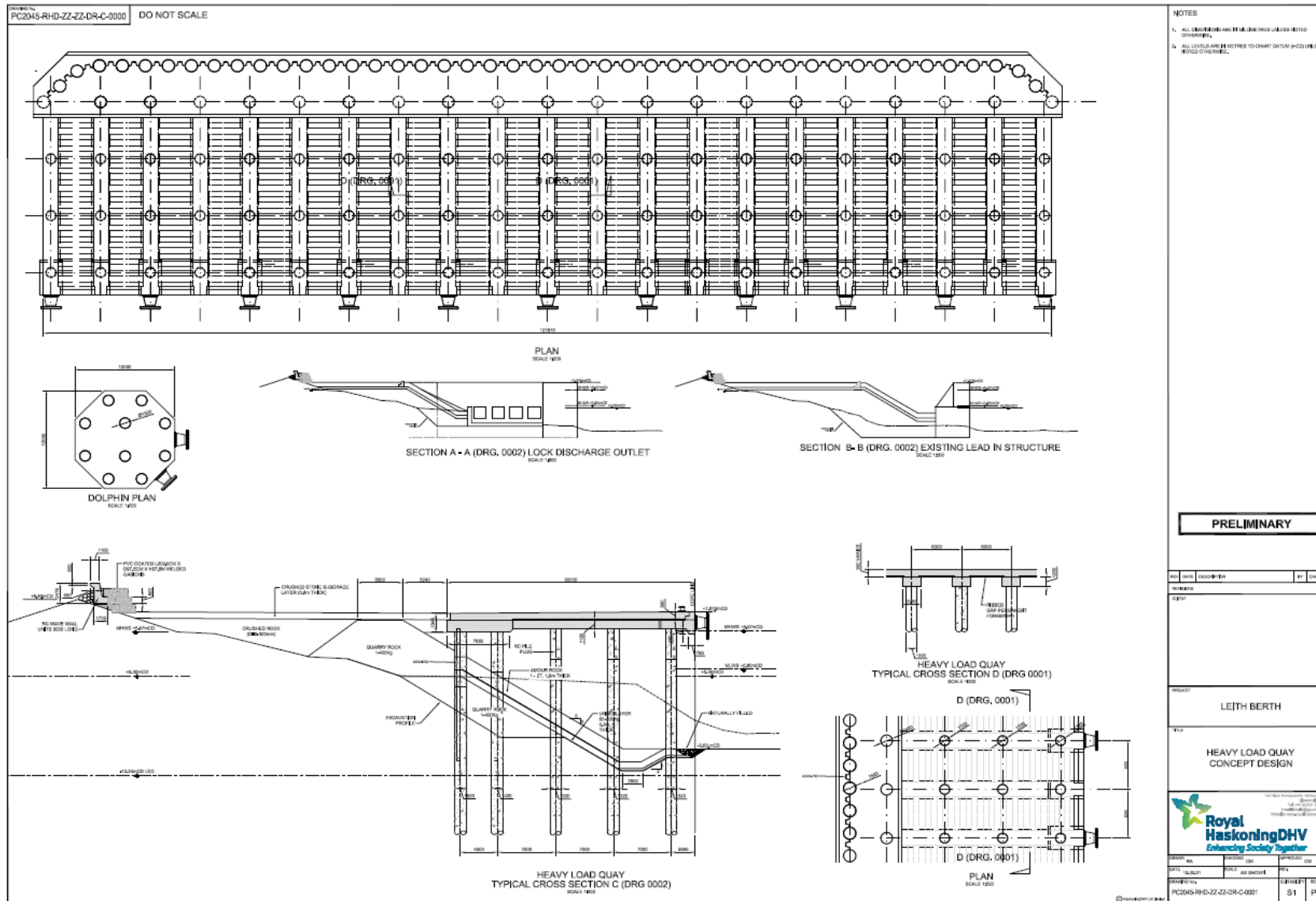


Figure 3-1 Leith Outer Berth Cross Sections

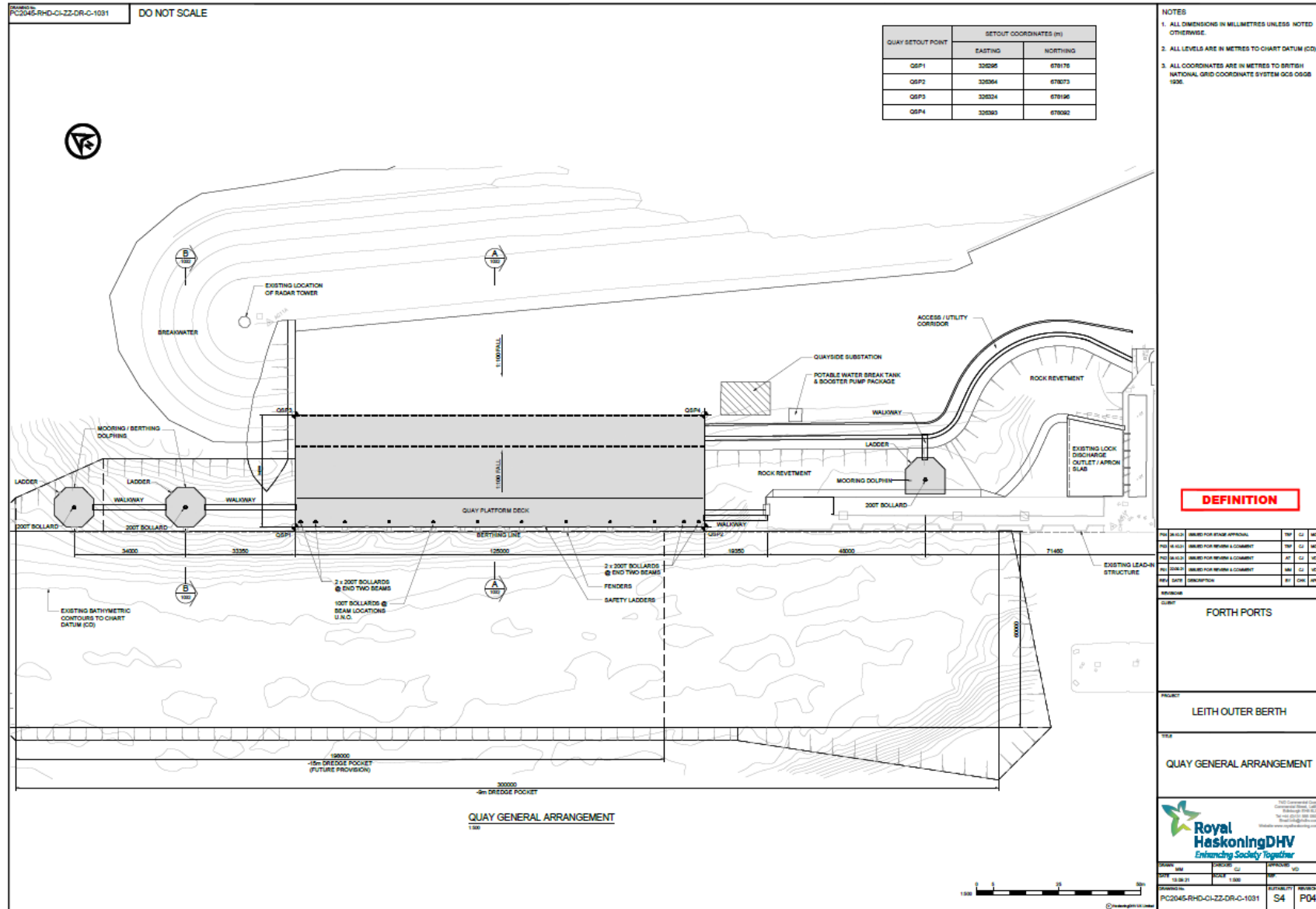


Figure 3-2 Indicative drawing of the Leith Outer Berth

3.2.2 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.

3.2.3 Berth pocket

The existing berth pocket (Area 4 in **Figure 1-1**) would be modified by dredging to between -9.25 and -10.25m CD, including a 0.25m over dredge allowance, and by approximately 300m by 60m wide. Total dredge volume is estimated to be approximately 100,000m³. 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.

3.2.4 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.

3.3 Operational Phase

3.3.1 Outer berth

The primary use of the improved outer berth would for use within the offshore renewables industry, providing facilities for the transshipment 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 of Leith, 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 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.

3.3.2 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 sea, as per the current situation. Lighting would be provided as required, comprised of downward direction 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..

Plate 3-2 to **Plate 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

3.4 Potential Environmental Effects

3.4.1 During construction

Potential impacts on bird species from construction activities include:

- Temporary or permanent habitat loss – small areas of open water and terrestrial habitat are likely to be temporarily and / or permanently lost.
- 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. Due to the existing busy nature of the port, and that the proposed development is within the access channel and current port area, it is not considered that there would be the potential for significant effect due to the presence of vessels and / or people during construction.
- Water quality impacts affecting prey availability – due to the potential release of contaminants and increased turbidity.
- Loss of prey due to underwater noise, impacts to sub-sea habitats, and changes to water quality.

3.4.2 During operation

It is considered that there would not be any potential for significant impacts during the operational phase of the proposed development, given no significant changes are proposed to the current activities at the Port of Leith. The Port of Leith already accepts vessels of a similar size to those that support the offshore renewables industry, in terms of length, height and deadweight; 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.

Overall, the proposed development would have a beneficial impact to the surrounding environment, due to 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. 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, including Self-Propelled Modular Transporters (SPMTs). 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, therefore reducing noise and emissions to air. In addition, it is expected that any vessel would be more modern, and therefore cleaner and quieter, than vessels that are currently using the port, due to their use within the offshore wind industry, which is relatively new, and continually expanding.

Overall, therefore the operational phase is not considered to have the potential to cause a LSE on any of the qualifying features and Conservation Objectives of the designated sites screened into the HRA. As such, the operational phase is not considered further within this report.

4 Stage 1: Screening

4.1 Approach to Screening

Screening is based on a conceptual 'source-pathway-receptor' approach. This approach identifies likely environmental effects resulting from the proposed construction and operation of the proposed development. The parameters are defined as follows:

- Source – the origin of a potential effect (noting that one source may have several pathways and receptors).

- Pathway – the means by which the effect of the activity could impact a receptor.
- Receptor – the element of the receiving environment that is impacted.

Where there is no pathway, or the pathway has sufficient distance such that the effect from the source has dissipated to a negligible level before reaching the receptor, there may be justification for the screening out of that particular receptor (i.e. feature) for the designated site in question.

Note that designated sites are screened in if, for any one of their qualifying features (i.e. a species or habitat), a source-pathway-receptor relationship and potential for LSE cannot be ruled out (including in-combination effects). However, each qualifying feature of that designated site will be considered separately and it may be that the screening process rules out LSE for some features at this stage. As described above, mitigation is not taken into account at Stage 1, but can be considered where relevant in the Stage 2 assessment.

The approach to screening for each receptor is based on the known distribution, ecology and sensitivities of each receptor group and therefore the potential for being affected. Where there is insufficient information available at this stage to screen out a designated site, the site is screened in for further consideration.

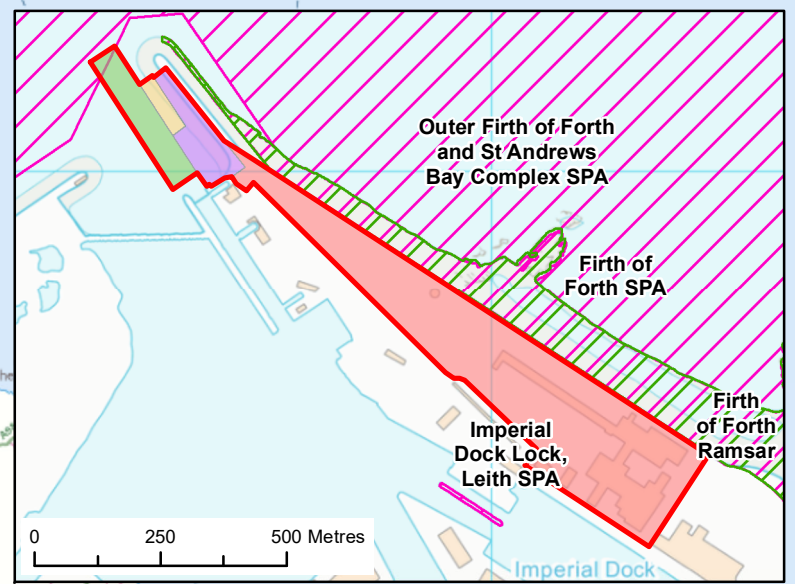
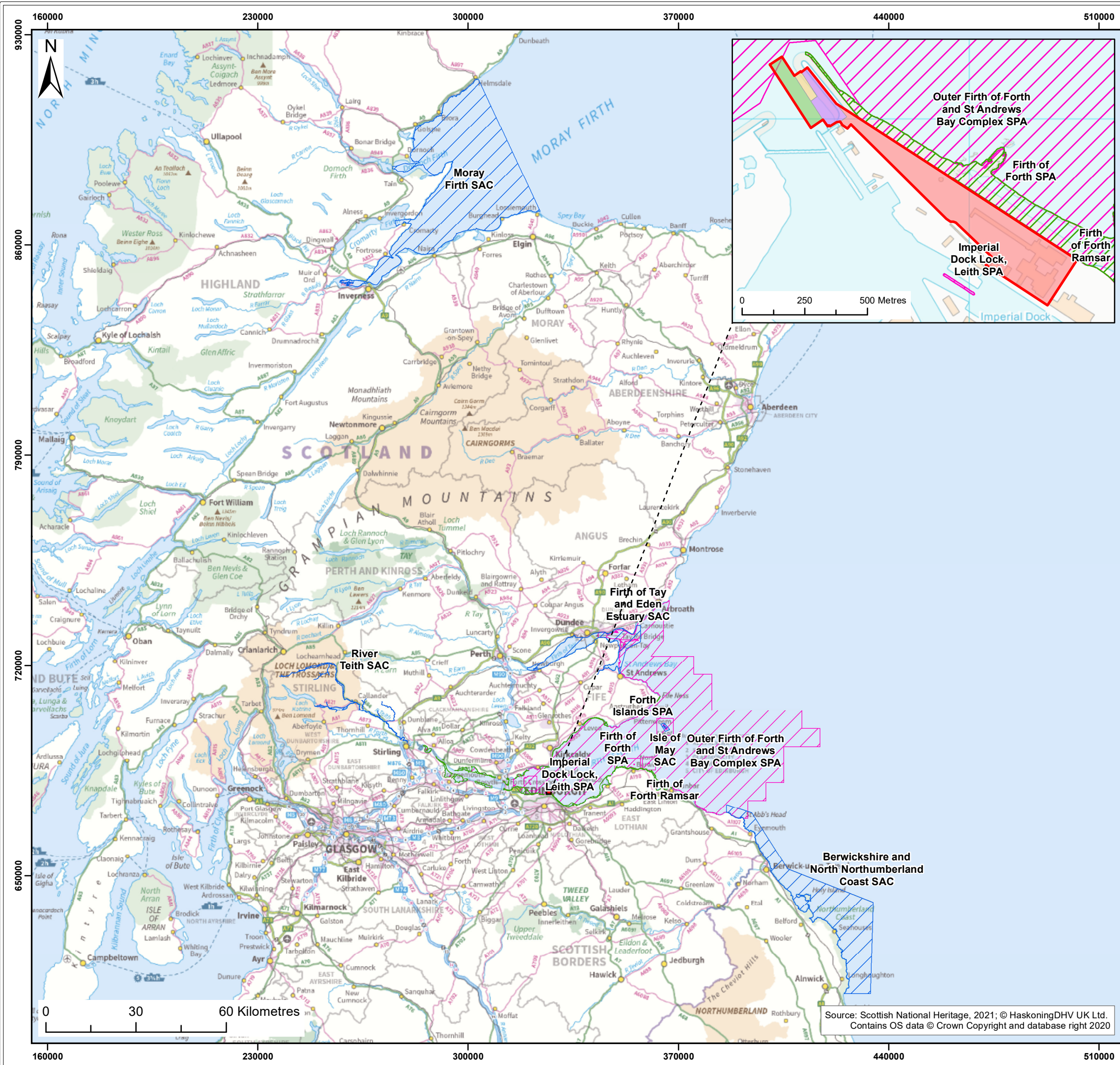
Based on the HRA guidance specifically developed for the Firth of Forth area (HRA on the Firth of Forth – A Guide for Developers and Regulators³), and early consultation that was undertaken on the project, it has been determined that the designated sites that should be considered within the HRA screening assessment are (**Figure 4-1**):

- **Outer Firth of Forth and St Andrews Bay Complex SPA** - 0km from the proposed development.
- **Firth of Forth SPA and Ramsar site** - 0km from the proposed development.
- **Imperial Dock Lock, Leith SPA** - Less than 1km from the proposed development.
- **Forth Islands SPA** - Approximately 4km from the proposed development.
- **River Teith SAC** - Approximately 49km from the proposed development, screened in for long-ranging or migratory species only.
- **Isle of May SAC** - Approximately 43km from the proposed development, screened in for long-ranging or migratory species only.
- **Firth of Tay and Eden Estuary SAC** - Approximately 64km from the proposed development, screened in for long-ranging or migratory species only.
- **Berwickshire and North Northumberland Coast SAC** - Approximately 63km from the proposed development, screened in for long-ranging or migratory species only.
- **Moray Firth SAC** - Approximately 300km from the proposed development, screened in for long-ranging or migratory species only.

The closest qualifying features related to benthic and intertidal habitats are approximately 43km (Isle of May SAC) and 64km (Firth of Tay and Eden Estuary SAC) from the proposed development, respectively. Consequently, where a designated site listed above has qualifying features related to benthic and intertidal habitats, these have been screened out of the HRA. As such, the following features are the focus of this HRA Screening assessment:

- Fish;
- Ornithology; and,
- Marine mammals.

³ 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



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

Designated sites

- Ramsar
- Special Area of Conservation
- Special Protected Area

Client:	Project:
Port of Leith	Leith Outer Berth
Title:	
Designated sites	

Figure: 2		Drawing No: PB2045-200-001			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	28/06/2021	JT	GS	A3	1:1,250,000

Co-ordinate system: British National Grid



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

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4.2 Alone Assessment

4.2.1 Fish

4.2.1.1 Screening of Designated Sites

River Teith SAC

The NatureScot guidance document (*HRA on the Firth of Forth – A Guide for Developers and Regulators*; SNH, 2019) states there is the potential for connectivity with the River Teith SAC due to the migration routes of Atlantic salmon *Salmo salar*, sea lamprey *Petromyzon marinus*, and river lamprey *Lampetra fluviatilis*. These species are known to occur within the wider Forth Estuary during parts of their life cycle.

The River Teith SAC is approximately 49km from the proposed development (**Figure 4-1**), and is the most significant tributary of the River Forth. The importance of this SAC is heightened as it supports populations of all three of the lamprey species.

Sea lamprey live in freshwater as juveniles, before migrating out to sea. There is no link between adult sea lamprey and their origin rivers, however, adults return to the River Teith every year. Spawning for sea lampreys usually occurs in late May or June, when the water temperature reaches at least 15°C (SNH, 2019). Sea lamprey will spend several years in silt beds, before migrating downstream to sea from autumn to mid-winter, travelling through the Firth of Forth from October to December (SNH, 2019). Sea lamprey will spend up to two years at sea before returning to freshwater; this can happen from as early as April, and spawning occurs from late May to June (SNH, 2019).

As with sea lamprey, river lamprey live in freshwater as juveniles, before migrating out to sea, and there is no evidence that adults will return to their river of origin. Spawning occurs when water reaches temperatures of 10-11°C, from late March to May, and then juveniles remain in freshwater for three to five years, before migrating out to sea. River lamprey may spend a significant proportion of their time in more coastal areas, including the Firth of Forth. Individuals will remain at sea for up to two years before returning to freshwater from October to December.

Atlantic salmon within the Firth of Forth have a complex life cycle, which starts and ends within freshwater catchments of the rivers Forth, Teith, and Allan (SNH, 2019). Atlantic salmon typically spend four years as juveniles in freshwater, before migrating downstream and out to sea. They would then spend up to four years at sea, before migrating back to their spawning grounds as adults. Juveniles migrate from freshwater to sea from March to May, and adults can migrate back to freshwater at any time of the year. Peak spawning occurs between November and December, but can extend from October to late February in larger rivers (SNH, 2019).

The Conservation Objectives for sea and river lamprey, and Atlantic salmon, are:

- To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,
- To ensure for the qualifying species that the following are maintained in the long term:
 - Population of the species, including range of genetic types for salmon, as a viable component of the site
 - Distribution of the species within site
 - Distribution and extent of habitats supporting the species
 - Structure, function and supporting processes of habitats supporting the species
 - No significant disturbance of the species

River lamprey and Atlantic salmon within the River Teith SAC are in favourable condition, and sea lamprey are in an unfavourable condition.

4.2.1.2 Potential Effects of the Proposed Development on fish species

There is the potential for the following effects of the proposed development to fish species during construction:

- Generation of underwater noise from piling operations and other construction activities (such as dredging) which could have physiological and/or behavioural response impacts;
- Impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime); 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 as proposed for marine mammals (see **Section 4.2.3.2**).

During operation, there would not be any significant change during the operational phase compared to the existing activity levels.

4.2.1.3 Results of alone Screening for LSE of fish species

Table 4-1 provides the results of the Screening for LSE as a result of the proposed development on fish species of the River Tay SAC.

Table 4-1 Alone Screening for LSE on fish species of the River Teith SAC

Qualifying feature	Potential effect	LSE concluded
Sea lamprey	Generation of underwater noise from piling operations and other construction activities	Yes
	Impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime)	Yes
	Impacts due to a change in habitat quality (e.g. increased sedimentation, loss of habitat)	Yes
River lamprey	Generation of underwater noise from piling operations and other construction activities	Yes
	Impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime)	Yes
	Impacts due to a change in habitat quality (e.g. increased sedimentation, loss of habitat)	Yes
Atlantic salmon	Generation of underwater noise from piling operations and other construction activities	Yes
	Impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime)	Yes
	Impacts due to a change in habitat quality (e.g. increased sedimentation, loss of habitat)	Yes

4.2.2 Ornithology

4.2.2.1 Screening of designated sites

The designated sites for ornithological features that have been screened into the HRA are:

- 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.

Each of these designated sites is described in further detail below and their locations in relation to the development are shown in **Figure 4-1**.

Outer Firth of Forth and St Andrews Bay Complex SPA

The Outer Firth of Forth and St Andrews Bay Complex SPA covers an extensive marine area off the east coast of Scotland, totalling 2,720.68km², including the Firth of Forth. This marine area has one of the largest and diverse marine bird concentrations in Scotland, and is designated for a total of 21 seabird and waterbird species (SNH & JNCC, 2017) (see **Table 4-2**).

Table 4-2 Summary of the Outer Firth of Forth and St Andrews Bay Complex SPA designated species and Conservation Objectives

Site name	Distance to proposed development	Species designated	Conservation Objectives (SNH & JNCC, 2016)
Outer Firth of Forth and St Andrews Bay Complex SPA	0km	<p>Annex 1 populations of European importance, non-breeding:</p> <ul style="list-style-type: none"> Red-throated diver (<i>Gavia stellata</i>) Slavonian grebe (<i>Podiceps auritus</i>) Little gull (<i>Larus minutus</i>) <p>Breeding:</p> <ul style="list-style-type: none"> Common tern (<i>Sterna hirundo</i>) Arctic tern (<i>Sterna paradisaea</i>) <p>Migratory populations of European importance, non-breeding:</p> <ul style="list-style-type: none"> Eider (<i>Somateria mollissima</i>) Waterfowl assemblage (long-tailed duck (<i>Clangula hyemalis</i>), common scoter (<i>Melanitta nigra</i>), velvet scoter (<i>Melanitta fusca</i>), goldeneye (<i>Bucephala clangula</i>), red-breasted merganser (<i>Mergus serrator</i>)) <p>(breeding):</p> <ul style="list-style-type: none"> Shag (<i>Phalacrocorax aristotelis</i>) Gannet (<i>Morus bassanus</i>) Seabird assemblage, breeding (puffin (<i>Fratercula arctica</i>), kittiwake (<i>Rissa tridactyla</i>), Manx shearwater (<i>Puffinus puffinus</i>), guillemot (<i>Uria aalge</i>), herring gull (<i>Larus argentatus</i>)) Seabird assemblage, non-breeding (black-headed gull (<i>Chroicocephalus ridibundus</i>), common gull (<i>Larus canus</i>), herring gull, guillemot, shag, kittiwake, razorbill) 	<p>To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.</p> <p>This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:</p> <ul style="list-style-type: none"> a) Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term; b) To maintain the habitats and food resources of the qualifying features in favourable condition.

Firth of Forth SPA and Ramsar site

The Firth of Forth SPA and Ramsar site is formed of an estuarine and coastal complex, covering an area of 63.2km² of coastline around the Firth of Forth, with extensive intertidal flats and rocky shores, saltmarsh, lagoons and sand dunes (SNH, 2018a) (see **Table 4-3**).

Table 4-3 Summary of the Firth of Forth SPA and Ramsar site designated species and Conservation Objectives

Site name	Distance to proposed development	Species designated	Conservation Objectives
Firth of Forth SPA (and Ramsar site)	0km	<p>Annex 1 populations of European importance, non-breeding:</p> <ul style="list-style-type: none"> Red-throated diver Slavonian grebe¹ Golden plover (<i>Pluvialis apricaria</i>) Bar-tailed godwit¹ (<i>Limosa lapponica</i>) <p>Post-breeding (passage):</p> <ul style="list-style-type: none"> Sandwich tern¹ (<i>Thalasseus sandvicensis</i>) <p>Migratory populations of European importance (non-breeding):</p> <ul style="list-style-type: none"> Pink-footed goose¹ (<i>Anser brachyrhynchus</i>) Shelduck¹ (<i>Tadorna tadorna</i>) Knot¹ (<i>Calidris canutus</i>) Redshank¹ (<i>Tringa totanus</i>) Turnstone¹ (<i>Arenaria interpres</i>) Waterfowl assemblage¹ (great-crested grebe (<i>Podiceps cristatus</i>), cormorant (<i>Phalacrocorax carbo</i>), scaup (<i>Aythya marila</i>), eider, long-tailed duck, common scoter, velvet scoter, goldeneye¹, red-breasted merganser, oystercatcher (<i>Haematopus ostralegus</i>), ringed plover (<i>Charadrius hiaticula</i>), grey plover (<i>Pluvialis squatarola</i>), dunlin (<i>Calidris alpina</i>), and curlew (<i>Numenius arquata</i>). 	<p>To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and</p> <p>To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> Population of the species as a viable component of the site Distribution of the species within site Distribution and extent of habitats supporting the species Structure, function and supporting processes of habitats supporting the species No significant disturbance of the species

Notes

¹ listed on Ramsar site citation in addition to SPA citation.

Imperial Dock Lock, Leith SPA

The Imperial Dock Lock, Leith SPA is located on a man-made structure at the mouth of the Imperial Dock in the heart of the Port of Leith, and covers a total area of 0.001km². This site is designated as it regularly supports a breeding population of common tern (SNH, 2004) (see **Table 4-4**).

Table 4-4 Summary of the Imperial Dock Lock, SPA designated species and Conservation Objectives

Site name	Distance to proposed development	Species designated	Conservation Objectives (SNH, 2004)
Imperial Dock Lock, Leith SPA	0.8km	<p>Annex 1 populations of European importance, Breeding:</p> <ul style="list-style-type: none"> common tern 	<p>To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and</p> <p>To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> Population of the species as a viable component of the site Distribution of the species within site Distribution and extent of habitats supporting the species

Site name	Distance to proposed development	Species designated	Conservation Objectives (SNH, 2004)
			<ul style="list-style-type: none"> - Structure, function and supporting processes of habitats supporting the species - No significant disturbance of the species

Forth Islands SPA

The Forth Islands SPA covers a series of islands that support the main seabird colonies within the Firth of Forth, and totals an area of 97.97km². The Islands covered by the site include the Isle of May, Fidra, The Lamb, Craigleith, Bass Rock, and Long Craig (see **Table 4-5**).

Table 4-5 Summary of the Forth Islands SPA designated species and Conservation Objectives

Site name	Distance to proposed development	Species designated	Conservation Objectives
Forth Islands SPA	3.6km	<p>Annex 1 populations of European importance, breeding:</p> <ul style="list-style-type: none"> • Arctic tern • Common tern • Roseate tern (<i>Sterna dougalli</i>) • Sandwich tern <p>Migratory populations of European importance, breeding</p> <ul style="list-style-type: none"> • Gannet • Lesser black-backed gull • Puffin • Shag • Seabird assemblage (razorbill, guillemot, kittiwake, herring gull, cormorant) 	<p>To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and</p> <p>To ensure for the qualifying species that the following are maintained in the long term:</p> <ul style="list-style-type: none"> - Population of the species as a viable component of the site - Distribution of the species within site - Distribution and extent of habitats supporting the species - Structure, function and supporting processes of habitats supporting the species - No significant disturbance of the species

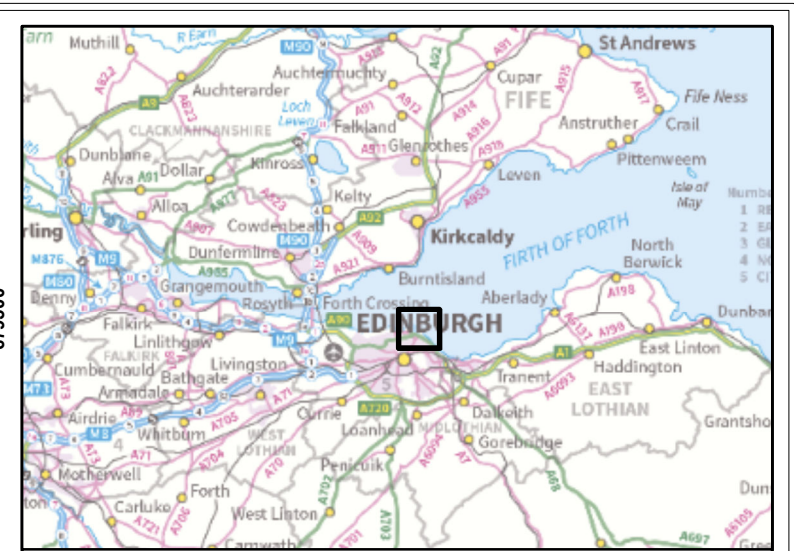
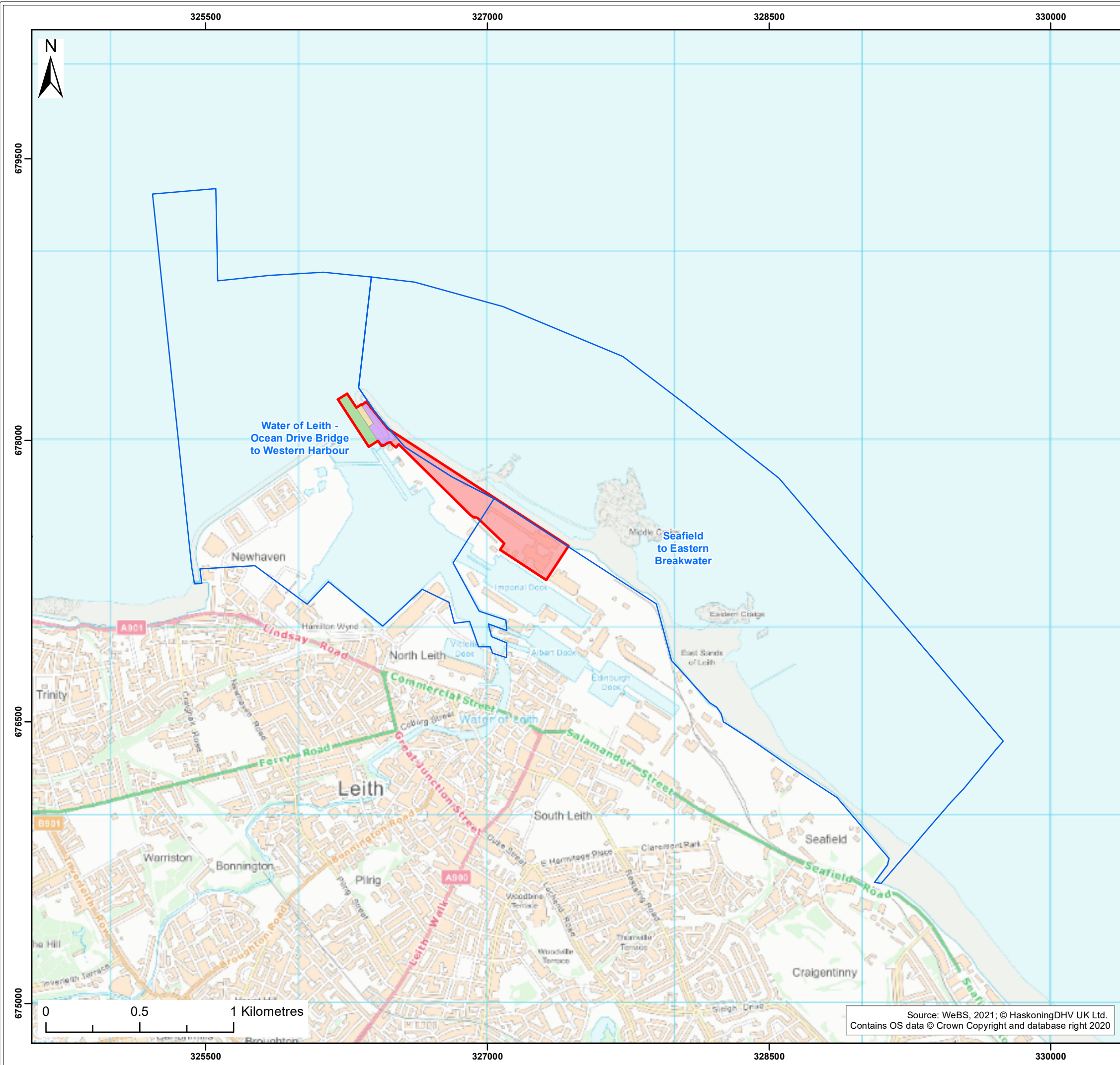
4.2.2.2 Abundance of SPA qualifying species in the vicinity of the proposed development

Recent data for estuarine birds have been obtained from the Wetland Bird Survey⁴ (WeBS). The WeBS scheme monitors the numbers and distribution of non-breeding waterbirds in the UK. Under the scheme, core counts are undertaken monthly in estuaries at high tide throughout the year. At high water, the available area of intertidal habitat is minimal and the waterbirds which use estuarine areas tend to concentrate in coastal roost sites. Core monthly counts therefore provide an indication of the total numbers of birds of a given species present in a given sector in a given month. The data presented are high tide counts from the following sectors which both overlap with the proposed development (**Figure 4-2**):

- Water of Leith – Ocean Drive Bridge to Western Harbour (83440), overlapping with and extending to the west of the development area; and,
- Seafeld to Eastern Breakwater (83441), overlapping with an extending to the east of the development area.

⁴ <https://www.bto.org/our-science/projects/wetland-bird-survey>

Available core count data for these count sectors in the most recent 5-year period are presented in **Table 4-6** and **Table 4-7**. Data are only available for either sector since 2018. The tables present peak monthly counts (the peak numbers of a given species recorded in a given month during the overall period for which data are available). Each table lists all qualifying species of the SPAs identified in **Section 4.2.2.1** (although not all species were recorded in each sector). For the purposes of screening, the peak annual counts from the WeBS sectors are used to provide an overall indication of the peak numbers of a given species present close to the proposed development, and the proportion of the population of a given SPA this represents (**Table 4-8**, **Table 4-9**, **Table 4-10** and **Table 4-11**). For most SPAs two population counts are given for a species, the numbers from the SPA citation at the time of classification, and updated estimates from Furness (2015). Only one estimate is given for the Outer Firth of Forth and St Andrews Bay Complex SPA as this site has been very recently classified (December 2020).



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
- WeBS sectors

Client:	Project:
Port of Leith	Leith Outer Berth

Title:
WeBS sectors

Figure: 3		Drawing No: PB2045-200-002			
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	28/06/2021	JT	GS	A3	1:20,000

Co-ordinate system: British National Grid

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

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Table 4-6 High Tide Counts of SPA qualifying species at Water of Leith - Ocean Drive to Western Harbour (WeBS Core Count Sector 83440). Darker blue shading indicates SPA species recorded on site and peak monthly counts.

Species	Peak Monthly Count July 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arctic tern	0	0	0	0	0	0	0	1	0	0	0	0
Bar-tailed godwit	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed gull	3,000	101	4	0	0	0	7	27	48	93	158	171
Common gull	0	0	0	0	0	0	0	0	20	0	0	0
Common scoter	0	0	0	3	0	0	0	0	0	0	0	0
Common tern	0	0	0	0	63	200	120	1	0	0	0	0
Cormorant	3	0	1	7	2	2	6	4	11	13	8	9
Curlew	0	0	0	0	0	0	0	1	0	1	1	0
Dunlin	0	0	0	0	0	0	0	0	0	0	0	0
Eider	32	50	106	107	48	220	19	12	12	4	55	29
Gannet	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	504	0	37	0	0	0	0	0	0	0	0	408
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0
Great-crested grebe	0	0	0	0	0	0	0	0	0	0	0	0
Grey plover	0	0	0	0	0	0	0	0	0	0	0	0
Guillemot	0	0	0	0	0	0	0	0	0	0	0	0
Herring gull	500	62	103	83	27	160	81	68	114	104	109	228
Kittiwake	0	0	0	0	0	0	0	0	0	0	0	0
Knot	0	0	0	0	0	0	0	0	0	0	0	0
Lesser black-backed gull	0	0	20	10	15	31	32	56	140	9	9	11
Little gull	0	0	0	0	0	0	0	0	0	0	0	0

Species	Peak Monthly Count July 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long-tailed duck	0	0	0	0	0	0	0	0	0	0	0	0
Oystercatcher	1	3	0	0	0	2	0	4	4	16	4	12
Pink-footed goose	0	0	0	0	0	0	0	0	0	0	0	0
Puffin	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted merganser	0	0	0	0	0	0	1	0	0	2	10	1
Red-throated diver	0	0	0	0	0	0	0	0	0	0	0	0
Redshank	0	1	0	0	0	0	0	0	0	0	0	0
Ringed plover	0	0	0	0	0	0	0	0	0	0	0	0
Roseate tern	0	0	0	0	0	0	0	0	0	0	0	0
Sandwich tern	0	0	0	0	0	0	2	125	9	0	0	0
Scaup	0	0	0	0	0	0	0	0	0	0	0	0
Shag	1	0	0	0	0	0	3	0	1	2	0	0
Shelduck	0	0	0	0	0	0	0	0	0	0	0	0
Slavonian grebe	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone	0	0	0	0	0	0	0	0	0	0	0	0
Velvet scoter	0	0	0	0	0	0	0	0	0	0	0	0
Non-SPA species												
Common sandpiper	0	0	0	0	0	0	2	0	0	0	0	0
Goosander	0	0	0	0	0	0	0	0	0	0	0	6
Great black-backed gull	7	0	1	0	0	1	2	0	2	1	8	5
Grey heron	0	0	0	0	0	0	7	3	0	4	3	0

Species	Peak Monthly Count July 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mallard	8	27	25	3	3	14	10	30	46	9	14	24
Mute swan	2	4	5	3	8	2	13	13	5	6	2	2
Tufted duck	0	0	0	2	0	0	0	0	0	0	0	0

Table 4-7 High Tide Counts of SPA qualifying species at Seafield to Eastern Breakwater (WeBS Core Count Sector 83441). Darker blue shading indicates SPA species recorded on site and peak monthly counts.

Species	Peak Monthly Count February 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arctic tern	0	0	0	0	0	0	0	1	0	0	0	0
Bar-tailed godwit	0	4	2	0	0	0	9	0	1	5	2	0
Common scoter	0	0	0	0	6	0	0	0	0	8	0	1
Common tern	0	0	0	0	0	0	0	0	2	1	0	0
Cormorant	11	4	9	3	7	12	26	13	50	41	17	3
Curlew	6	14	9	8	4	1	19	28	30	27	15	6
Dunlin	0	0	33	0	7	1	11	3	4	28	3	2
Eider	133	57	265	141	205	660	391	426	713	112	40	78
Gannet	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	46	71	2	0	0	0	0	0	0	0	11	114
Golden Plover	0	0	0	0	0	0	0	1	0	0	0	0
Great-crested grebe	2	1	0	0	0	0	0	0	0	0	1	0
Grey plover	0	0	0	0	0	0	0	0	0	0	0	0
Guillemot	0	0	0	0	0	0	0	0	0	0	0	0
Herring gull	0	0	0	0	0	0	0	0	0	0	0	0

Species	Peak Monthly Count February 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kittiwake	0	0	0	55	1	0	0	0	0	0	0	0
Knot	0	0	0	0	0	0	1	0	0	0	0	0
Lesser black-backed gull	0	0	0	0	0	0	0	0	0	0	0	0
Little gull	0	0	0	0	0	0	0	0	0	0	0	0
Long-tailed duck	0	3	0	0	0	0	0	0	0	0	0	0
Oystercatcher	270	140	105	121	91	39	68	161	165	252	193	70
Pink-footed goose	0	0	0	0	0	0	0	0	60	150	0	0
Puffin	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted merganser	17	26	13	6	0	0	0	0	4	18	10	26
Red-throated diver	3	0	0	3	0	1	0	0	0	2	7	0
Redshank	120	160	122	143	0	0	48	29	6	63	33	140
Ringed plover	73	43	34	24	14	4	42	55	8	37	77	37
Roseate tern	0	0	0	0	0	0	0	0	0	0	0	0
Sandwich tern	0	0	0	4	0	0	0	0	12	15	2	0
Scaup	0	0	0	0	0	0	0	0	0	0	0	0
Shag	7	16	13	19	3	10	2	1	23	34	18	6
Shelduck	1	3	3	2	2	0	0	0	0	0	0	0
Slavonian grebe	0	0	0	0	0	0	0	0	0	0	0	0
Turnstone	35	66	33	27	3	5	3	29	36	25	33	31
Velvet scoter	6	0	0	5	0	0	0	0	0	0	2	0
Non-SPA species												

Species	Peak Monthly Count February 2018 – June 2020											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common sandpiper	0	0	0	3	0	0	0	2	0	0	0	0
Goosander	0	0	0	0	0	0	0	0	6	3	0	0
Grey heron	0	1	0	0	0	0	0	1	1	0	0	0
Mallard	0	5	34	11	13	13	0	5	0	0	16	0
Mediterranean gull	2	0	0	0	0	0	1	2	0	0	0	0
Mute swan	0	1	4	1	3	0	0	0	0	0	0	4
Purple sandpiper	7	11	10	15	1	0	0	0	0	1	3	0
Snipe	1	0	0	0	0	0	0	0	0	0	0	0
Spotted redshank	0	0	0	0	0	0	1	0	0	0	0	0
Teal	0	0	0	0	0	0	0	0	3	0	0	0
Tufted duck	0	0	0	0	0	1	0	0	0	0	0	0
Whimbrel	0	0	0	0	0	0	1	0	0	0	0	0
Wigeon	2	0	0	0	0	0	0	0	0	0	0	0

Table 4-8 Peak counts of qualifying species of the Outer Firth of Forth and St Andrews Bay Complex SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA populations (Nature Scot 2020, SNH and JNCC 2016). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population

Species	SPA citation (individuals)	population	Sector 83440		Sector 84441	
			Peak count	% SPA	Peak count	% SPA
Arctic tern	1,784		1	<0.1%	1	<0.1%
Common tern	1,080		200	19%	2	0.2%
Eider	21,546		220	1%	713	3%
Gannet	10,945		0	0	0	0
Little gull	126		0	0	0	0
Red-throated diver	851		0	0	7	0.8%
Shag	4,800		3	<0.1%	34	0.7%
Slavonian grebe	30		0	0	0	0
Waterfowl assemblage						
Common scoter	4,677		3	<0.1%	8	0.2%
Goldeneye	589		504	86%	114	19%
Long-tailed duck	1,948		0	0	3	0.2%
Red-breasted merganser	431		10	2%	26	6%
Velvet scoter	775		0	0	6	0.8%
Seabird assemblage, breeding						
Guillemot	28,123		0	0	0	0
Kittiwake	12,020		0	0	55	0.5%
Herring gull	3,044		500	16%	0	0
Manx Shearwater	2,885		0	0	0	0
Puffin	61,086		0	0	0	0
Seabird assemblage, non-breeding						
Black-headed gull	26,835		3,000	11%	0	0
Common gull	14,647		20	0.1%	0	0
Guillemot	21,968		0	0	0	0
Herring gull	12,313		500	4%	0	0
Kittiwake	3,191		0	0	0	0
Razorbill	5,481		0	0	0	0
Shag	2,426		3	0.1%	34	1%

Table 4-9 Peak counts of qualifying species of the Firth of Forth SPA and Ramsar site at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation populations (SNH 2001) and the most recent 5 year mean peak counts for the Forth Estuary (Frost et al. 2021). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population

Species	SPA citation population (individuals)	Forth Estuary 5 year peak mean 2015/16-2019-20	Sector 83440			Sector 84441		
			Peak count	% SPA	% 5 year peak mean	Peak count	% SPA	% 5 year peak mean
Bar-tailed godwit	1,974	1,142	0	0	0	9	0.6%	0.8%
Golden plover	2,949	1,261	0	0	0	1	<0.1%	<0.1%
Knot	9,258	3,370	0	0	0	1	<0.1%	<0.1%
Pink-footed goose	10,852	17,544	0	0	0	150	1%	1%
Red-throated diver	90	51	0	0	0	7	8%	14%
Redshank	4,341	4,932	1	<0.1%	<0.1%	160	4%	3%
Sandwich tern	1,617	1,270	125	8%	10%	15	1%	1%
Shelduck	4,509	3,628	0	0	0	3	<0.1%	<0.1%
Slavonian grebe	84	20	0	0	0	0	0	0
Turnstone	860	680	0	0	0	66	8%	10%
Waterfowl assemblage								
Common scoter	2,880	3,575	3	0.1%	0.1%	8	0.3%	0.2%
Cormorant	682	522	13	2%	2%	50	7%	10%
Curlew	1,928	3,392	1	<0.1%	<0.1%	30	2%	1%
Dunlin	9,514	6,061	0	0	0	33	0.4%	0.5%
Eider	9,400	5,018	220	2%	4%	713	8%	14%
Goldeneye	3,004	1,577	504	17%	32%	114	4%	7%
Great-crested grebe	720	85	0	0	0	2	0.3%	2%
Grey plover	724	196	0	0	0	0	0	0
Long-tailed duck	1,045	181	0	0	0	3	0.3%	2%
Oystercatcher	7,846	6,782	16	0.2%	0.2%	270	3%	4%
Red-breasted merganser	670	296	10	2%	3%	26	4%	9%
Ringed plover	328	310	0	0	0	77	23%	24%
Scaup	437	21	0	0	0	0	0	0
Velvet scoter	635	883	0	0	0	6	1%	1%

Table 4-10 Peak counts of qualifying species of the Imperial Dock Lock Leith SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation population (SNH 2004) and updated estimates (Furness 2015). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population

Species	SPA citation population (individuals)	Furness (2015)	Sector 83440			Sector 84441		
			Peak count	% SPA	% SPA Furness 2015	Peak count	% SPA	% SPA Furness 2015
Common tern	1,116	1,636	200	18%	12%	2	0.2%	0.1%

Table 4-11 Peak counts of qualifying species of the Forth Islands SPA at WeBS Sectors adjacent to the Leith Outer Berth (83440 and 83441) compared with the SPA citation populations (SNH 2018b) and updated estimates (Furness 2015). Darker blue shading indicates species present in one or both WeBS sectors in numbers representing 1% or more of the SPA population

Species	SPA citation population* (individuals)	Furness (2015)	Sector 83440			Sector 84441		
			Peak count	% SPA	% SPA Furness 2015	Peak count	% SPA	% SPA Furness 2015
Arctic tern	1080	530	1	<0.1%	0.2%	1	<0.1%	0.2%
Common tern	668	52	200	30%	385%	2	0.3%	4%
Gannet	43,200	110,964	0	0	0	0	0	0
Lesser black-backed gull	3,000	3,216	140	5%	4%	0	0	0
Puffin	28,000	124,462	0	0	0	0	0	0
Roseate tern	16	6	0	0	0	0	0	0
Sandwich tern	880	0	125	14%	n/a	15	2%	n/a
Shag	4,800	1,700	3	<0.1%	0.2%	34	0.7%	2%
Seabird assemblage, breeding								
Cormorant	400	160	13	3%	8%	50	13%	31%
Guillemot	32,000	29,348	0	0	0	0	0	0
Herring gull	13,200	5,654	500	4%	9%	0	0	0
Kittiwake	16,800	6,200	0	0	0	55	0.3%	0.9%
Razorbill	2,800	5,250	0	0	0	0	0	0

*The SPA citation is dated 2018 however the population estimates for qualifying features are for time periods between 1992 and 2001

4.2.2.3 Potential Effects of the Proposed Development of Birds

The potential effects on birds, either direct or indirect (via prey / habitat), are listed in **Table 4-12** based upon the potential for environmental impacts described in **Section 3.4**.

Table 4-12 Potential effects of the proposed development on SPA Qualifying Bird Species

Potential Effect	Construction	Operation
Direct effects		
Disturbance (noise and visual) and displacement due to works activity, piling, and other plant, lighting	✓	x
Temporary or permanent loss of habitats of importance	✓	x
Water quality effects, release of sediment (turbidity) and contaminants	✓	x
Indirect effects via availability / abundance / habitats of prey		
Underwater noise disturbance	✓	x
Water quality, turbidity and contaminants	✓	x

4.2.2.4 Results of the alone Screening for LSE on Birds

The alone Screening for LSE of the SPAs and qualifying features is presented in **Table 4-13**. Screening has been based on the peak counts from WeBS core count data in relation to SPA populations, as shown in

Table 4-6 to Table 4-11 Table 4-12. A qualifying species has been screened in if the data indicated that the species was present close to the proposed development in numbers representing more than 1% of the SPA population. A qualifying assemblage has been screened in if the data indicated that one or more component species was present in the vicinity of the development in numbers representing more than 1% of the SPA population.

Table 4-13 Alone Screening for LSE on qualifying features of the SPAs and Ramsar site

Site	Distance from development	Qualifying feature	LSE concluded
Outer Firth of Forth and St Andrews Bay Complex SPA	0km	Arctic tern	Yes
		Common tern	No
		Eider	No
		Gannet	Yes
		Little gull	Yes
		Red-throated diver	No
		Shag	Yes
		Slavonian grebe	Yes
		Waterfowl assemblage (Common scoter, goldeneye, long-tailed duck, red-breasted merganser, velvet scoter)	No
		Seabird assemblage, breeding (puffin, kittiwake, Manx shearwater, guillemot, herring gull).	No
		Seabird assemblage, non-breeding (Black-headed gull, common gull, herring gull, guillemot, shag, kittiwake, razorbill)	No
Firth of Forth SPA and Ramsar site	0km	Bar-tailed godwit	Yes
		Golden plover	Yes
		Knot	Yes
		Pink-footed goose	No
		Red-throated diver	No
		Redshank	No
		Sandwich tern	No
		Shelduck	Yes
		Slavonian grebe	Yes
		Turnstone	No
		Waterfowl assemblage (great-crested grebe, cormorant, scaup, eider, long-tailed duck, common scoter, velvet scoter, goldeneye, red-breasted merganser, oystercatcher, ringed plover, grey plover, dunlin, curlew).	No
Imperial Dock Lock Leith	0.8km	Common tern	Yes
Forth Islands	3.6km	Arctic tern	Yes
		Common tern	No
		Gannet	Yes
		Lesser black-backed gull	No

Site	Distance from development	Qualifying feature	LSE concluded
		Puffin	Yes
		Roseate tern	Yes
		Sandwich tern	No
		Shag	No
		Seabird assemblage, breeding (razorbill, guillemot, kittiwake, herring gull, cormorant)	No

4.2.3 Marine Mammals

4.2.3.1 Screening of Designated Sites

As outlined in **Section 4**, The NatureScot guidance document (*HRA on the Firth of Forth – A Guide for Developers and Regulators*; SNH, 2019) states that the following designated sites for marine mammal species be considered (see **Figure 4-1**):

- Isle of May SAC;
- Firth of Tay and Eden Estuary SAC;
- Berwickshire and North Northumberland Coast SAC; and,
- Moray Firth SAC.

The following sections describe these sites, and the marine mammal species for which they are designated, in further detail.

Isle of May SAC

The Isle of May SAC is located at the entrance to the Firth of Forth, approximately 43km from the proposed development. This site supports a breeding colony of grey seal *Halichoerus grypus*, with the largest east coast breeding colony of grey seals in Scotland, and the fourth-largest breeding colony in the UK (JNCC, 2021).

Grey seal pup production at the Isle of May SAC has been relatively stable since the late 1990s, with approximately 2,000 pups born each year (SCOS, 2020), with approximately 2,050 recorded in 2010 (Russell *et al.*, 2019). Based on the grey seal count of 2008-2017, the overall abundance in the east coast of Scotland is estimated to be 10,741 (95% Confidence Interval (CI) 9,870-12,173) (SCOS, 2019).

Grey seals haul-out on land to rest, moult, and breed. Foraging trips can last between one and 30 days, and usually occurs within 100km of their haul-out site, although individuals have been reported to travel up to several hundred kilometres offshore to forage (SCOS, 2019). In Scotland, grey seal pupping occurs between September and December, with the moult occurring between December and April the following year (Hague *et al.*, 2020).

Tagging studies of grey seal within UK waters have been undertaken since 1988, with a total of 285 individuals tracked within Scottish waters. These studies show that there is connectivity with the proposed development and the Isle of May Coast SAC, with individuals travelling from the SAC through the Firth of Forth, and near to the proposed development (Hague *et al.*, 2020).

The Isle of May SAC Conservation Objectives for grey seal are:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,
- To ensure for the qualifying species that the following are maintained in the long term:
 - Population of the species as a viable component of the site
 - Distribution of the species within site
 - Distribution and extent of habitats supporting the species
 - Structure, function and supporting processes of habitats supporting the species
 - No significant disturbance of the species

Grey seal within the Isle of May SAC are in favourable condition.

Firth of Tay and Eden Estuary SAC

The Firth of Tay and Eden Estuary SAC supports a nationally important breeding colony of harbour seal *Phoca vitulina*, which form part of the east coast population of seals that typically utilise sandbanks. The latest harbour seal count (from 2019) in the Firth of Tay and Eden Estuary SAC was 41 (SCOS, 2020), and the population in this site has been in decline since the 2000s; the 1990 to 2002 count within the SAC was 641 (Hague *et al.*, 2020), compared to the current site of 41. Based on the harbour seal count of 2015-2017, the overall abundance in the east coast of Scotland is estimated to be 481 (95% CI 393-641) (SCOS, 2019).

Harbour seal haul-out on land to rest, breed, and moult, with the core pupping period being between June and July. Harbour seal generally take foraging trips of between 30km and 50km, however, movements of harbour seal vary among individuals, and have reported foraging trips of up to 200km (Lowry *et al.*, 2001; Sharples *et al.*, 2012).

Tagging studies of harbour seal within UK waters have been undertaken since 2001, with a total of 420 individuals tracked within Scottish waters. These studies show that there is connectivity with the proposed development and the Firth of Tay and Eden Estuary SAC, with individuals travelling from the SAC through the Firth of Forth, and near to the proposed development (Hague *et al.*, 2020).

The Firth of Tay and Eden Estuary SAC Conservation Objectives for harbour seal are:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and,
- To ensure for the qualifying species that the following are maintained in the long term:
 - Population of the species as a viable component of the site
 - Distribution of the species within site
 - Distribution and extent of habitats supporting the species
 - Structure, function and supporting processes of habitats supporting the species
 - No significant disturbance of the species

Harbour seal within the Firth of Tay and Eden Estuary SAC are in unfavourable condition.

Berwickshire and North Northumberland Coast SAC

There are two main pup production locations within the Berwickshire and North Northumberland Coast SAC, one at the Farne Islands and one at Fast Castle. In 2010, pup production was estimated to be 1,700 at Fast Castle and 1,500 at the Farne Islands, a total of 3,200 within the SAC as a whole (Russell *et al.*, 2019). Based on the grey seal count of 2008-2017, the overall abundance in the east coast of Scotland is estimated to be 10,741 (95% CI 9,870-12,173) (SCOS, 2019).

Tagging studies of grey seal within UK waters show that there is connectivity with the proposed development and the Berwickshire and North Northumberland Coast SAC, with individuals travelling from the SAC through the Firth of Forth, and near to the proposed development (Hague *et al.*, 2020).

The SAC includes a protected grey seal haul-out site at Fast Castle, which is approximately 58km from the proposed development.

The Berwickshire and North Northumberland Coast SAC Conservation Objectives for grey seal are:

- To ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:
 - The extent and distribution of qualifying natural habitats and habitats of the qualifying species
 - The structure and function (including typical species) of qualifying natural habitats
 - The structure and function of the habitats of the qualifying species
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
 - The populations of each of the qualifying species
 - The distribution of qualifying species within the site

Grey seal within the Berwickshire and North Northumberland Coast SAC are in favourable condition.

Moray Firth SAC

The Moray Firth SAC in north-east Scotland supports the only known resident population of bottlenose dolphin *Tursiops truncatus* in the North Sea. Individuals are present all year round, and, while they range widely in the Moray Firth, they appear to favour particular areas. The bottlenose dolphin is a wide ranging species and occurs across the continental shelf. Historically, very few sightings of bottlenose dolphin were recorded further south on the east coast of the UK, however, in recent years an increase in bottlenose dolphins in the north-east of England have been reported (Aynsley, 2017), with one individual from the Moray Firth population being recorded as far south as The Netherlands (NatureScot, 2021).

The bottlenose dolphin population estimate within the Moray Firth is 209 individuals (95% CI 198 – 230; Arso Civil *et al.*, 2019).

The Moray Firth SAC Conservation Objectives for bottlenose dolphin are:

1. To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of Moray Firth SAC is maintained or restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:
 - a. The population of bottlenose dolphin is a viable component of the site.
 - b. The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance.

- c. The supporting habitats and processes relevant to bottlenose dolphin and the availability of prey for bottlenose dolphin are maintained.

Bottlenose dolphin within the Moray Firth SAC are in favourable condition.

4.2.3.2 Potential Effects of the Proposed Development on Marine Mammals

There is the potential for the following effects of the proposed development to marine mammals:

- 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, changes to hydrological regime) 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*⁵. This will ensure that the potential effect ranges for instantaneous permanent auditory injury are mitigated for and therefore not 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 effect as a result of the presence of construction vessels (including as a result of underwater noise, and an increase in collision risk), either at the proposed development, or while transiting past any nearby seal haul-out sites.

Activities during the operational phase would be in line with current activities, and therefore there would be no effects to marine mammals during operation of the berth.

4.2.3.3 Results of alone Screening for LSE on Marine Mammals

Table 4-14 provides the results of the Screening for LSE as a result of the proposed development on marine mammals.

Table 4-14 Alone Screening for LSE on marine mammal qualifying features of the SACs

Designated site	Qualifying feature	Potential effect	LSE concluded
Isle of May SAC	Grey seal	Generation of underwater noise from piling operations and other construction activities	Yes
		Disturbance to seal haul-out sites	No
		Indirect impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime) and prey availability	Yes
		Increase in collision risk presence and underwater noise disturbance due to increase in vessels	No
Firth of Tay and Eden Estuary	Harbour seal	Generation of underwater noise from piling operations and other construction activities	Yes
		Disturbance to seal haul-out sites	No
		Indirect impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime) and prey availability	Yes

⁵ <https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf>

Designated site	Qualifying feature	Potential effect	LSE concluded
		Increase in collision risk presence and underwater noise disturbance due to increase in vessels	No
Berwickshire and Northumberland SAC	North Coast Grey seal	Generation of underwater noise from piling operations and other construction activities	Yes
		Disturbance to seal haul-out sites	No
		Indirect impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime) and prey availability	Yes
		Increase in collision risk presence and underwater noise disturbance due to increase in vessels	No
Moray Firth SAC	Bottlenose dolphin	Generation of underwater noise from piling operations and other construction activities	Yes
		Increase in collision risk presence and underwater noise disturbance due to increase in vessels	No
		Indirect impacts due to changes to water quality (e.g., increased suspended sediment, changes to hydrological regime) and prey availability	Yes

4.3 In-combination Assessment

Projects with the potential for in-combination are those located within 5km of the proposed development, as beyond this distance it would not be expected that there is the potential for combined disturbance to individuals affected by the proposed development and other projects. This 5km screening distance has been used for both bird species and fish. For the wider ranging species (such as seals and bottlenose dolphin), it is important to consider projects over a wider area. For seals, projects are considered if they are located within the Firth of Forth, and for bottlenose dolphin, due to the SAC they are associated with being within the Moray Firth, projects are considered if they are located within the Firth of Forth, as well as off the east coast of Scotland, between the proposed development and the inner Moray Firth.

The projects within the areas as noted above are included **Table 4-15** below, with an indication as to whether they will be considered further due to a temporal overlap with the construction of the proposed development.

Table 4-15 Projects with the potential for in-combination effects with the proposed development

Project	Location (approximate distance from the proposed development)	Stage	Date of Activity	Screened in for further consideration
Nigg Energy Park East Quay	Cromarty Firth, approximately 196km	Under construction	Construction from 2021-2022	Yes – potential for overlap in construction timeframes

Project	Location (approximate distance from the proposed development)	Stage	Date of Activity	Screened in for further consideration
	(340km around the coastline)			
NorthConnect HVDC Cable	Landfall at Peterhead, 187km (195km around the coastline)	Application approved	2019-2023 (operational by 2023 ⁶ with overall construction period of 54 months ⁷)	Yes – potential for overlap in construction timeframes
Seagreen Alpha and Bravo Offshore Wind Farms (Optimised Project)	Firth of Forth, approximately 69km from cable corridor and 96km from windfarm site (or 73km from cable corridor and 98km from windfarm site around the coastline)	Application approved	Expected to be fully commissioned by 2023	Yes – potential for overlap in construction timeframes
Neart na Gaoithe Offshore Wind Farm (Revised Design)	Firth of Forth, approximately 60km	Under construction	Construction from 2019-2022 ⁸	Yes – potential for overlap in construction timeframes
Port of Cromarty Firth - Phase 4 Development, Invergordon Service Base	Cromarty Firth, approximately 198km (351km around the coastline)	Under construction	Construction 2019-2021	No – construction periods would not overlap
Beatrice Offshore Windfarm	Moray Firth, approximately 243km (299km around the coastline)	Operational	N/A	No – as the project is currently operational, it is considered to be part of the baseline
European Offshore Wind Deployment Centre	Aberdeenshire, 151km (158km around the coastline)	Operational	N/A	No – as the project is currently operational, it is considered to be part of the baseline
Hywind Scotland Pilot Park	Aberdeenshire, 197km (201km around the coastline)	Operational	N/A	No – as the project is currently operational, it is considered to be part of the baseline
Inch Cape Offshore Windfarm Revised Design	Firth of Forth, approximately 61km (landfall at Prestonpans – 11km)	Application approved	Construction 2021-2024	Yes – potential for overlap in construction timeframes
Kincardine Offshore Windfarm	Aberdeenshire, approximately 136km	Under construction	Construction 2016-2021 ⁹	No – construction periods would not overlap

⁶ <https://marine.gov.scot/sites/default/files/hvdcca1.pdf>
⁷ https://marine.gov.scot/sites/default/files/02_project_description_0.pdf
⁸ https://marine.gov.scot/sites/default/files/combined_document_-_revised.pdf
⁹ www.4coffshore.com

Project	Location (approximate distance from the proposed development)	Stage	Date of Activity	Screened in for further consideration
	(139km around the coastline)			
Moray East Offshore Windfarm	Moray Firth, approximately 233km (281km around the coastline)	Under construction	Operational by 2022	Yes – potential for overlap in construction timeframes
Moray West Offshore Windfarm	Moray Firth, approximately 224km (291km around the coastline)	Application approved	Construction 2024-2026 ⁹	No – construction periods would not overlap
Sea Wall Repair and Extension – Alexandra Parade	Peterhead, approximately 189km (195km around the coastline)	Application approved	Construction 2020-2024 ¹⁰	Yes – potential for overlap in construction
Grangemouth Flood Protection Scheme	Firth of Forth, approximately 30km (31km around the coastline)	Pre-application	Five to year ten year construction, starting from 2022 ¹¹	Yes – potential for overlap in construction
Ardersier Port Development	Moray Firth, approximately 185km (344km around the coastline)	Application approved	Construction to commence in 2019	Yes – potential for overlap in construction

Table 4-16 below indicates the designated sites (and features) for which there is the potential for in-combination effects with the projects screened in for further consideration in **Table 4-15**.

¹⁰ https://marine.gov.scot/sites/default/files/environmental_appraisal_document_redacted.pdf

¹¹ https://marine.gov.scot/sites/default/files/grangemouth_fps_eia_scoping_report_final_for_submission.pdf

Table 4-16 In combination Screening for LSE of designated sites (and features)

Project	Designated site	Features screened in	Potential for in-combination effect?
Nigg Energy Park East Quay	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	No – not within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
NorthConnect HVDC Cable	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	

Project	Designated site	Features screened in	Potential for in-combination effect?
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	No – not within the Firth of Forth study area
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
Redevelopment of Dundee East	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	Yes - within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC

Project	Designated site	Features screened in	Potential for in-combination effect?
Seagreen Alpha and Bravo Offshore Wind Farms (Optimised Project)	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	Yes - within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
Neart na Gaoithe Offshore Wind Farm (Revised Design)	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	

Project	Designated site	Features screened in	Potential for in-combination effect?
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	Yes - within the Firth of Forth study area
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
Inch Cape Offshore Windfarm Revised Design	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	Yes - within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC

Project	Designated site	Features screened in	Potential for in-combination effect?
Moray East Offshore Windfarm	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	No – not within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
Sea Wall Repair and Extension – Alexandra Parade	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	

Project	Designated site	Features screened in	Potential for in-combination effect?
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	No – not within the Firth of Forth study area
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC
Grangemouth Flood Protection Scheme	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	Yes - within the Firth of Forth study area
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC

Project	Designated site	Features screened in	Potential for in-combination effect?
Ardersier Port Development	River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon 	No – more than 5km from the proposed development
	Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage 	
	Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, redshank, sandwich tern, and turnstone waterfowl assemblage 	
	Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern 	
	Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage 	
	Isle of May SAC	<ul style="list-style-type: none"> grey seal 	No – not within the Firth of Forth study area
	Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal 	
	Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal 	
	Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin 	Yes – within area used by the bottlenose dolphin population of the Moray Firth SAC

5 Conclusion of the Screening Assessment

5.1 Conclusion of Screening for LSE

Table 5-1 summarises the sites and features where a LSE has been concluded and therefore would be the subject of the appropriate assessment.

Table 5-1 Summary of screening for LSE

Designated Site	Feature
River Teith SAC	<ul style="list-style-type: none"> sea lamprey, river lamprey, and Atlantic salmon
Outer Firth of Forth and St Andrews Bay Complex SPA	<ul style="list-style-type: none"> common tern, eider, and red-throated diver waterfowl assemblage breeding seabird assemblage non-breeding seabird assemblage
Firth of Forth SPA and Ramsar site	<ul style="list-style-type: none"> pink-footed goose, red-throated diver, redshank, sandwich tern, and turnstone waterfowl assemblage
Imperial Dock Lock Leith SPA	<ul style="list-style-type: none"> common tern
Forth Islands SPA	<ul style="list-style-type: none"> common tern, lesser black-backed gull, sandwich tern, and shag breeding seabird assemblage
Isle of May SAC	<ul style="list-style-type: none"> grey seal
Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> harbour seal
Berwickshire and North Northumberland Coast SAC	<ul style="list-style-type: none"> grey seal
Moray Firth SAC	<ul style="list-style-type: none"> bottlenose dolphin

5.2 Approach to Providing Information for Appropriate Assessment

5.2.1 Approach for ornithological features

A LSE has been concluded on one or more qualifying feature (**Table 4-13**) of all four of the SPAs screened into the HRA (**Section 4.2.2.1**). The potential for an Adverse Effect on site Integrity (AEol) to occur will be considered further in the appropriate assessment for the Leith Outer Berth. This will present detailed information and evidence on the potential effects relevant to each species and SPA. To underpin this assessment, site specific surveys will be used to confirm the numbers and distribution of birds within and close to the proposed development site. When the baseline data collection is complete, a check on the LSE screening will be carried out to confirm the conclusions presented in **Table 4-13**.

Further desk study data and information will also be collated to support the appropriate assessment, including recent population trends of SPA features screened in for LSE. For the assessment of potential indirect impacts due to changes in water quality and prey availability, this will be based on assessments undertaken on coastal processes (including numerical modelling), marine water and sediment quality (including a sediment quality survey), benthic ecology, and fish and shellfish ecology.

5.2.2 Approach for marine mammal fish features

To undertake the assessment for underwater noise impacts, site-specific underwater noise modelling is not considered necessary and a desk-based assessment would instead be undertaken. This assessment will include a review of modelled impact ranges from other similar activities, which have been modelled with the most recent marine mammal thresholds (NMFS, 2018 or Southall *et al.*, 2019) and fish (Popper *et al.*, 2014). Reports that may be used to inform this assessment include the Port of Cromarty Firth (Phase 4 Development) (Port of Cromarty Firth, 2018), Sizewell C Nuclear Power Plant, UK ((EDF Energy, 2020), Victoria Harbour, Hartlepool, UK (PD Teesport, 2018), and Nigg East Quay (Global Energy Group, 2019)¹². A full review of relevant information will be undertaken to inform the underwater noise assessment. Mitigation measures would be undertaken in line with the *Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise*¹³, and will ensure that the potential impact ranges for instantaneous permanent auditory injury are mitigated for.

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.

For the potential for indirect impacts due to changes in water quality and prey availability, this will be based on assessments undertaken on coastal processes (including numerical modelling), marine water and sediment quality (including a sediment quality survey), benthic ecology, and fish and shellfish ecology.

As above for ornithological features, once the baseline review for marine mammals and fish species is complete, the screening for LSE will be reviewed to ensure conclusions remain valid. If more recent baseline data becomes available, it will be used in addition to the sources referenced within this HRA screening document.

¹³ <https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf>

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