

**Proposed Redevelopment of  
Dundee East**

Habitats Regulations Appraisal  
Appropriate Assessment

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# 1 Introduction

## Overview

- 1.1 The applicant (Port of Dundee Ltd) is submitting a Marine Licence application to Marine Scotland for various quayside works which include the proposed construction of a Ro-Ro facility, new quay and dredging at the Port of Dundee as shown on Drawing Number 130143/8003. The central Ordnance Survey grid reference for the application site is NO43493085. A location plan is provided in Section 7 (Figure 1).
- 1.2 BSG Ecology was appointed by Fairhurst on 16 September 2019 to undertake a Habitats Regulations Appraisal (HRA) 'screening assessment for likely significant effects' for the proposed development. The screening assessment (BSG Ecology, 2019) confirmed the requirement and scope for an Appropriate Assessment, which is presented in this report.
- 1.3 There are a number of European sites within 10 km of the Application site (see Section 3 for information on the extent of the study area). These are:
- Firth of Tay and Eden Estuary SAC (the proposed development extends into the SAC);
  - Firth of Tay and Eden Estuary SPA (2.9 km east);
  - Firth of Tay and Eden Estuary Ramsar (2.9 km east);
  - Outer Firth of Forth and St Andrews Bay Complex proposed SPA (adjacent to part of the Application site).
- 1.4 Following consultation with Scottish Natural Heritage (SNH) in November 2019, the screening assessment was extended to include the following additional European sites:
- Barry Links SAC (7.5 km east);
  - Isle of May SAC (36 km south-east).
- 1.5 In addition to the above sites the assessment has also considered impacts on highly mobile qualifying features (species) that may use the Firth of Tay adjacent to the Application site. For this reason the following additional sites have been included in the assessment:
- River Tay SAC (due to the presence of migratory fish species);
  - Moray Firth SAC (due to the presence of bottlenose dolphin in the Firth of Tay, which may be linked to the Moray Firth population).
- 1.6 The locations of the European sites are shown on Figure 2 in Section 7.
- 1.7 This document presents the results of a shadow Habitat Regulations Appraisal<sup>1</sup> appropriate assessment, which will provide information to assist Dundee City Council and Marine Scotland to discharge their duties as the 'competent authority' as defined under Regulation 48(1) of the Conservation (Natural Habitats, &c.) Regulations 1994 (hereafter referred to as the 'Habitats Regulations').

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<sup>1</sup> Under the Conservation (Natural Habitats, &c.) Regulations 1994 the 'competent authority' is responsible for completing a Habitats Regulations Appraisal (HRA). If an HRA is carried out by a third party with the objective of it being adopted by the competent authority, this is often referred to as a shadow HRA.

### Application site description

- 1.8 The application site is located on land at the Port of Dundee, which is operated by the Port of Dundee. To the north of the application site is Stannergate Road, to the east is a rocky foreshore fronting the Firth of Tay, to the south is the Firth of Tay and operational berths associated with the use of Prince Charles Wharf and the Prince Charles Wharf Extension. To the west of the application site is further land owned and operated by the Port of Dundee. The application boundary and existing uses on-site are shown on Drawing Number 130143/8002. Vehicular access is from Stannergate Road.
- 1.9 The Port of Dundee provides services for the North Sea oil and gas industry, construction industry, paper pulp and forest products sectors, and also a wide range of general and bulk cargoes. The Port of Dundee comprises 1,600m of quayside and currently has 6 working berths. Recently, there has been £10 million invested into various redevelopments, which have included a new quayside to support the decommissioning and offshore wind farm industry, which the Port of Dundee has a strong presence in due to its strategic location.
- 1.10 As shown on Drawing Number 130143/8002, the application site currently contains a range of buildings and land uses common to an operational port. There is an existing dredge pocket to the front of the existing quay. The existing Prince Charles Wharf and Prince Charles Wharf Extension also lie within the site.

### The proposed works

- 1.11 The proposed development is shown on Drawing Number 130143/8003 and consists of the following main elements:
- The widening of the existing dredged berth associated with the Prince Charles Wharf Extension from 200m x 40m to 200m x 60m. The depth of the berth will increase to -10.0mCD;
  - Slab thickening / strengthening to the existing Prince Charles Wharf, to increase quayside capacity;
  - The creation of a new suspended quay on land to the west of Prince Charles Wharf; and
  - The creation of a new 170m x 30m berth pocket to the south of the proposed suspended quay. Dredging works will be to a depth of -9.0mCD.
- 1.12 The construction works involved for the suspended quay and the strengthening and repair work to the existing quays, will consist of the following:
- Installation of (tubular) piling and (sheet) piling (by vibro and / or hammer);
  - Strengthening / repairs to steel pile through the installation of steel plating;
  - Revetment, including general filling and placement of rock armour;
  - Reinforced concrete slabbing / decking, including drilling and dowelling into existing slabs forming the existing quay / wharf; and
  - Utility and lighting installations.
- 1.13 Some new hardstanding will be created through the proposed suspended quay (shown on Drawing 134380/8002).
- 1.14 Sediment sampling has been undertaken which confirms that the sediment in the vicinity of the application site comprises of sandy silt and silty sand with some samples presenting gravel fractions. Whilst there are elevated concentrations of some metals and PAHs within the dredged material, these are consistent with historic industrial discharges to the Firth of Tay.

- 1.15 A report detailing the Best Practicable Environmental Option (BPEO) for the disposal of the sediments has been used to inform this shadow HRA (ERM, 2019). The report confirms that disposal of sediments offshore to a licensed sea disposal site (the preferred option being the Middle Bank disposal site) is the BPEO.
- 1.16 The proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. The dredged material will be deposited at the Middle Bank spoil ground and so there will be no overall change in local sediment supply within the outer Firth of Tay.
- 1.17 The BPEO report (ERM, 2019) notes that the disposal operations may cause the occasional exceedance of Environmental Quality Standards and failure to meet Water Framework Directive (WFD) objectives, although it is concluded that this would be localised and short-term. The BPEO report also notes that the disposal operations may affect the benthic fauna in proximity to the disposal site due to sediment drifting from the disposal area itself.
- 1.18 It is anticipated that there will not be any significant impact on the Tay marine ecosystem as a whole given the scale and duration of effects. There may be some short term effects, such as displacement on migrating fish due to increased turbidity caused by the discharge of dredged material into the water column, but these impacts are not predicted to cause mortality or alter the viability of populations. Under the disposal proposed, cumulative impacts with other operations are not predicted to create a significant impact to the SAC or marine ecosystem (ERM, 2019).

#### Source-receptor-pathway Model

- 1.19 The spatial scope of this HRA has been determined by application of the source-pathway-receptor model, which highlights whether there is any potential pathway that connects development to any European sites. In this case the spatial scope of the assessment is informed by identifying the impacts that could potentially arise as a result of the development, assessing the spatial and temporal scope of those impacts and understanding the effects on sensitive receptors that might arise.
- 1.20 The following definitions have been adopted for the purposes of the screening process when applying the source-pathway-receptor model to each relevant designated site and its qualifying features:
- The **source** of the impact is the process that generates the identified impact (e.g. piling during construction works);
  - The **pathway** for the impact is the route the source takes to reach the ecological receptor (e.g. noise related disturbance that affects birds on nearby intertidal mudflats);
  - The **receptor** is the ecological feature that may be subject to an impact via an identified pathway (e.g. birds as in the previous example).
- 1.21 For a 'likely significant effect' or an 'adverse effect on integrity' to occur, an impact must have a source and also a clear linking pathway and a negative impact upon the receptor.

## 2 Habitats Regulations Appraisal

### Legislation

- 2.1 The Conservation (Natural Habitats, &c.) Regulations 1994 (the 'Habitats Regulations') transpose the requirements of two European Directives in to UK legislation:
- i. Council Directive on the conservation of natural habitats and of wild fauna and flora of 21<sup>st</sup> May 1992 (92/43/EEC) (the 'Habitats Directive'); and
  - ii. Council Directive on the conservation of wild birds of 2<sup>nd</sup> April 1979 (70/409/EEC) consolidated by Council Directive on the conservation of wild birds 2009 (2009/147/EC (the 'Birds Directive')).
- 2.2 The Habitats Directive aims to protect plants, habitats and animals other than birds, and this is achieved in part through the creation of Special Areas of Conservation (SACs).
- 2.3 The Birds Directive aims to protect rare and vulnerable birds and the habitats that they depend upon and this is achieved in part through the classification of Special Protection Areas (SPAs).
- 2.4 The measures in the Directives required to protect these sites are transposed in to UK legislation as the assessment process set out in the Habitats Regulations (see below).
- 2.5 The UK is also a contracting party to the Convention on wetlands of international importance especially as waterfowl habitat, Ramsar, Iran, 1971 (the 'Ramsar Convention') which seeks to protect wetlands of international importance, especially those wetlands utilised as waterfowl habitat. It is Scottish Government policy that all competent authorities should treat Ramsar sites in their decision making processes as if they are SACs or SPAs. This policy also brings candidate SACs (cSACs) and potential SPAs (pSPAs) within the requirement for HRA.
- 2.6 In this report the term 'European sites' is used to refer collectively to SACs, SPAs and Ramsar sites.
- 2.7 On 31 January 2020 the UK left the European Union (referred to as 'exit day') and will be subject to transitional arrangements until 31 December 2020. From 'exit day' the provisions of the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 apply which amend the Conservation (Natural Habitats, &c.) Regulations 1994 in a manner that ensures they continue to operate, including without the need for reference to European institutions.

### Habitats Regulations Appraisal process

- 2.8 The requirements of the Habitats Regulations with regard to the implications of plans or projects are set out within Regulation 48 (as amended). The step-based approach implicit within this regulation is referred to as a 'Habitats Regulations Appraisal', which is the term that has been used throughout this report.
- 2.9 It is a requirement of any public body (referred to as a competent authority within the Habitats Regulations) to carry out a Habitats Regulations Appraisal when they are proposing to carry out a project, implement a plan or authorise another party to carry out a plan or project. Competent authorities are required to record the process undertaken, ensuring that there will be no adverse effects on the integrity of any European Site as a result of a plan or project whether alone or in combination with other plans or projects.

### Appraisal stages

- 2.10 The assessment of a plan or project goes through a number of stages, with guidance having been published to aid competent authorities fulfil their responsibilities (e.g. European Commission 2001; DCLG, 2006; European Commission 2008). Those stages are summarised in Table 1 below.

**Table 1: Stages in the Habitats Regulations Appraisal process (Source: The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended))**

Stage	Description	Legislative Context
Purpose	Determines if the purpose of the plan or project is directly connected with, or necessary, to the management of a European Site. If it is, then no further assessment is necessary	Regulation 48(1)
Scoping	The identification of any European Site that might be within scope of a HRA, i.e. those European Sites should be taken forward to the screening stage based on a wide consideration of spatial and ecological factors. Such European Sites may be located within the plan or project area but may also include sites located in neighbouring authority areas.	Regulation 48(1)(a) – assessment of ‘in combination’ effects
Screening	Assessment of whether a plan or project, either alone or in combination with other plans or projects, is likely to have a significant effect on any European Sites’ qualifying features (habitats and species) and the achievement of the European Site’s conservation objectives.  This is also known as the ‘test of likely significant effect’ (ToLSE).	Regulation 48(1)(a)
Appropriate Assessment	Consideration of the impacts of the proposals to determine whether or not it is possible to conclude with certainty that the development will not result in any adverse effect on the integrity of any European Site, either alone or in combination with other plans or projects and with reference to the European Site’s conservation objectives.  This is also known as the test of ‘adverse effect on integrity’ (AEol).  At this stage consent may be granted for the plan or project if it is possible to conclude with certainty that the proposal will not result in any adverse effect on the integrity of any European Site, either alone or in combination with other plans or projects.	Regulation 48(1)
If it cannot be concluded with certainty that the proposal will not result in any adverse effect on the integrity of any European Site then proceed to:		
Assessment of alternative solutions	Assess whether there is an alternative solution to the plan or project, i.e. one that better respects European Sites.  If no such alternative solution exists, the process continues to an assessment of whether there are ‘imperative reasons of overriding public interest’ (IROPI) for the plan or project to proceed.	Regulation 49(1)
Assessment of IROPI	Assess whether a plan or project can be justified as being needed for ‘imperative reasons of overriding public interest’ (IROPI).	Regulation 49(1)
Compensatory measures	Identify and secure any necessary compensatory measures to ensure that the overall coherence of the European Site network is protected.	Regulation 52

## **Interpretation of Terminology**

### ***Likely Significant Effect***

- 2.11 The term 'likely significant effect' comes from Regulation 48(1) of the Habitats Regulations and its interpretation has been shaped by case law and guidance (e.g. European Commission, 2001; European Commission, 2018).
- 2.12 SNH advises that a conclusion of 'no likely significant effect' can only be reached for a plan or project if there is clearly no ecological connectivity to the site's qualifying interests and if the plan or project obviously will not undermine the conservation objectives for the qualifying interests to which it has a connection.
- 2.13 SNH also advises that the process of checking for likely significant effects should be a relatively quick and straightforward decision and must include plans and projects at any distance beyond the Natura site's boundaries.
- 2.14 Case law has provided clarity about the terms 'likely' and 'significant'. In the Waddenzee case (European Court of Justice C-127/02) the European Court of Justice ruled that a plan or project should undergo an appropriate assessment "if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site". Following on from this the Sweetman case (European Court of Justice C-258/11) reinforced and further refined the Waddenzee case interpretation. The Advocate General's Opinion stated: "the question is simply whether the plan or project concerned is capable of having an effect."
- 2.15 In light of this guidance and feedback from SNH (SNH, November 2019) a precautionary approach has been adopted in the screening assessment. An impact is considered likely to have a significant effect if there is ecological connectivity to a European site's qualifying interests and if the proposed development could potentially undermine the European site's conservation objectives in the absence of mitigation.

### ***Appropriate Assessment***

- 2.16 The term 'appropriate assessment' also comes from Regulation 48(1) of the Habitats Regulations. The scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed plan or project and the interest features of the relevant European site. The term 'appropriate' indicates that an assessment needs to be proportionate and sufficient to allow the competent authority to determine whether a plan or project will adversely affect the integrity of a European site.
- 2.17 The content and structure of an appropriate assessment is not specifically defined; however, it must contain complete, precise and definitive findings and conclusions to ensure that there is no reasonable scientific doubt as to the effects of a proposed plan or project.

### **Case law on the HRA process**

- 2.18 The Court of Justice of the European Union (CJEU) and UK Court judgements have identified that in the HRA process the assessment may not have 'lacunae' (gaps or omissions) and must contain complete, precise and definitive findings capable of removing all reasonable scientific doubt as to the effects of the proposed works on the European Site concerned. Court judgements have identified that in the HRA process all aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the conservation objectives of European Sites concerned must be identified in the light of the best scientific knowledge available in the field.

- 2.19 A recent CJEU judgement (People Over Wind and Sweetman, 12 April 2018, C-323/17) has provided clarification as to when avoidance or reduction (i.e. mitigation) measures can be considered within the HRA process. The headline for the case is:

*“In the light of all the foregoing considerations, the answer to the question referred is that Article 6(3) of the Habitats Directive must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site”.*

- 2.20 This case means that a competent authority cannot rely on avoidance or reduction measures that allow a conclusion of ‘no likely significant effect’ to be reached: instead it is necessary to accept that there is a ‘likely significant effect’ in the absence of these measures, and move to the next stage, i.e. appropriate assessment, at which point such mitigation measures can be considered. This recent judgement is accounted for in this report.
- 2.21 A further CJEU judgement (Holohan & Ors. v An Bord Pleanála, 7 November 2018, C - 461/17) provides further clarification about the HRA process, requiring that all habitats and species associated with a European Site (irrespective of whether or not they are qualifying features) must be considered in the assessment if impacts on those non-qualifying habitats or species are liable to affect the conservation objectives of the European Site through, for instance, effects on ecological processes or food chains. This recent judgement is also accounted for in this report.

### 3 Scope of the Appraisal

3.1 The Zone of Influence (Zol) for the proposed development is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This may extend beyond the application site boundary. The Zol has been used to determine the extent of the desk study and baseline ecological surveys.

3.2 During the construction stage of the development the Zol is considered to be the area around the application site where impacts might arise during the construction, operation and decommissioning phases of the development. The extent of the Zol necessarily varies depending upon the sensitivity of the ecological receptors being considered and the impact mechanism being considered. In this assessment a 10 km Zol has been adopted, which is based on the following considerations:

- Habitat loss and disturbance arising from construction work will be limited to the application site itself, with dust related impacts potentially extending to 50 m beyond the application site boundary (see below). Pollution effects may be wider ranging if pollutants enter the adjacent Firth of Tay, and dredging related effects may also extend further than the area where dredging takes place. Nevertheless, Bates *et al* (2004) reports that the Firth of Tay is 'characterised by powerful tidal currents and a high suspended sediment load', and dredging already takes place at the port, so dredging related impacts are unlikely to be wide ranging. A precautionary 8 km Zol has been applied to take account of such impacts (following consultation with SNH in November 2019, who requested that impacts on Barry Links SAC should be considered).
- Disturbance related impacts on mobile species, such as birds, are potentially wider ranging. The Outer Firth of Forth and St Andrews Bay Complex pSPA is located adjacent to the application site and so any qualifying species using the Firth of Tay near the application site may be disturbed by the proposed works. Whilst disturbance related impacts on birds are unlikely to extend as far as the nearest part of the Firth of Tay and Eden Estuary SPA, which is 2.9 km to the east, it is possible that there may be disturbance of birds using 'functionally linked areas' (see below). Published information indicates that those birds that could potentially be present in the vicinity of the application site are unlikely to be disturbed at distances exceeding 1 km from a source (Ruddock & Whitfield, 2007; Laursen *et al*, 2005; Cutts, Phelps & Burdon, 2009).
- Consultation with SNH (SNH, November 2019) led to a recommendation to include the Isle of May SAC in the screening assessment. Grey seal *Halichoerus grypus* is a qualifying feature of the SAC and this species can travel over large distances when feeding. Whilst the SAC is approximately 36 km to the south-east of the Port of Dundee, a precautionary approach has been adopted and for the purposes of the screening assessment it has been assumed that grey seal could travel as far as the Firth of Tay (which may therefore provide habitat that is functionally linked to the SAC). If grey seal use the Firth of Tay then they may be susceptible to disturbance related impacts.
- Research shows that the maximum effect distance of piling related noise on marine mammals was 14 km at an offshore wind farm site where noise mitigation systems were employed (Brandt & Diederichs, 2018). Dahl (2015) notes that intense sound impulses from impact piling are likely to disrupt the behaviour of marine mammals at ranges of many kilometres and have the potential to induce hearing impairment at close range. As marine piling is proposed a precautionary 14 km Zol is considered to be appropriate when assessing impacts on marine mammals.
- Experimental research shows that in a contained situation Atlantic salmon *Salmo salar* did not perceive pile driving playback noise as a stressor. One explanation that is provided centres on Atlantic salmon hearing ability: this species is particularly sound insensitive lacking specialist hearing mechanisms (Harding *et al*, 2016). The author's also observe that 'the lack of such mechanisms reduces the fish's sensitivity and bandwidth to detect a noise stimulus, resulting in a poorer ability to distinguish specific acoustic cues from background noise'.

- 3.3 Current guidance (Holman *et al*, 2014) advises that construction related dust impacts only need to be considered for important ecological features within 50 m of the development boundary. As the nearest European site is adjacent to the application site, dust arising from the construction and decommissioning phases of the development has been considered in the assessment.
- 3.4 Consideration also needs to be given to areas that are not subject to a European designation but which may be 'functionally linked' to a European site if it serves a function for the interest features of that site. Functional linkage has been defined as follows (Chapman & Tyldesley, 2016):
- 3.5 *'the term 'functional linkage' refers to the role or 'function' that land or sea beyond the boundary of a European site might fulfil in terms of ecologically supporting the populations for which the site was designated or classified. Such land is therefore 'linked' to the European site in question because it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status.'*
- 3.6 In summary, the following potential types of adverse effect have been considered in this assessment:
- Physical habitat loss – land take by the works and indirect effects from dredging (and impact arising from disposal of dredge spoil), whilst noting that the application site is operational port land and dredging does already occur at the site;
  - Physical habitat damage – from on-site activities (which may include functionally-linked areas), albeit this is expected to be limited to the increased dredge areas;
  - Disturbance – e.g. noise from working machinery or visible presence of people, whilst noting that the application site is operational port land.
  - Changes in water quality – from the release of water-borne pollutants (including dust deposited in the marine environment), whilst noting that the application site is operational port land and dredging does already occur at the site.
  - Changes in air quality – from the release of airborne pollutants, whilst noting that the application site is operational port land.
- 3.7 Taking into account all impact mechanisms and the ZoIs that have been adopted for the assessment, together with the consultation response received from SNH (SNH, November 2019), the HRA considers impacts on the following European sites (Figure 2, Section 8):
- Firth of Tay and Eden Estuary SAC;
  - Firth of Tay and Eden Estuary SPA;
  - Firth of Tay and Eden Estuary Ramsar;
  - Outer Firth of Forth and St Andrews Bay Complex pSPA;
  - River Tay SAC (due to functionally-linked habitat);
  - Barry Links SAC;
  - Isle of May SAC (due to potentially functionally-linked habitat);
  - Moray Firth SAC (due to potentially functionally-linked habitat).
- 3.8 No impact mechanisms have been identified for any other European sites that are located more than 10 km from the application site and so they have been scoped out of this assessment.

## 4 Information on the Relevant European Sites

4.1 Set out below is information relating to the following parameters for each of the European Sites within the scope of the assessment:

- Site name
- Site code
- Year classified/designated/listed
- Area
- Qualifying interest features
- Conservation objectives
- Distance between nearest component of European Site and the proposed development
- Sources of information

4.2 The European Sites that have been considered are as follows: Firth of Tay and Eden Estuary SAC, SPA and Ramsar, Outer Firth of Forth and St Andrews Bay Complex pSPA, the River Tay SAC; Isle of May SAC, Barry Links SAC and Moray Firth SAC (see Figure 2 in Section 7).

Table 1: Firth of Tay and Eden Estuary SAC summary information

<b>Site name: Firth of Tay and Eden Estuary SAC</b>
Site code: UK0030311
Year designated: 2005
Area: 15441.63 ha
<p>Qualifying interest features:</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Estuaries</li> </ul> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Sandbanks which are slightly covered by sea water all the time</li> <li>• Mudflats and sandflats not covered by seawater at low tide</li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Harbour seal <i>Phoca vitulina</i></li> </ul>
<p>Conservation objectives:</p> <p>To avoid deterioration of the qualifying habitats 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</p> <p>To ensure for the qualifying habitats that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>• Extent of the habitat on site;</li> <li>• Distribution of the habitat within site;</li> <li>• Structure and function of the habitat;</li> <li>• Processes supporting the habitat;</li> <li>• Distribution of typical species of the habitat;</li> <li>• Viability of typical species as components of the habitat;</li> <li>• No significant disturbance of typical species of the habitat.</li> </ul>

<b>Site name: Firth of Tay and Eden Estuary SAC</b>
Distance: The SAC is adjacent to the application site.
Sources of information: Site citation - <a href="https://sitelink.nature.scot/site/8257">https://sitelink.nature.scot/site/8257</a> JNCC Natura 2000 Data Form - <a href="http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030311.pdf">http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030311.pdf</a> Conservation Objectives - <a href="https://sitelink.nature.scot/site/8257">https://sitelink.nature.scot/site/8257</a> Supplementary advice on condition of features - <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8257">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8257</a> Site Improvement Plan – n/a

Table 2: Firth of Tay and Eden Estuary SPA summary information

<b>Site name: Firth of Tay and Eden Estuary SPA</b>
Site code: UK9004121
Year listed: 2005
Area: 6,947.62 ha
Qualifying interest features: <p>The Firth of Tay and Eden Estuary SPA qualifies under Article 4.1 by regularly supporting populations of European importance of the Annex I species:</p> <ul style="list-style-type: none"> <li>Marsh harrier <i>Circus aeruginosus</i>; little tern <i>Sternula albifrons</i> and bar-tailed godwit <i>Limosa lapponica</i>.</li> </ul> <p>The Firth of Tay and Eden Estuary SPA further qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species:</p> <ul style="list-style-type: none"> <li>redshank <i>Tringa totanus</i>; greylag goose <i>Anser anser</i> and pink-footed goose <i>Anser brachyrhynchus</i>.</li> </ul> <p>The Firth of Tay and Eden Estuary SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. During the period 1990/91 to 1994/95 a winter peak mean of 48,000 individual waterfowl was recorded, comprising 28,000 wildfowl and 20,000 waders, including nationally important populations of the following species: velvet scoter <i>Melanitta fusca</i>.</p> <p>Qualifying species: bar-tailed godwit <i>Limosa lapponica</i>; black-tailed godwit <i>Limosa limosa islandica</i>; common scoter <i>Melanitta nigra</i>; cormorant <i>Phalacrocorax carbo</i>; dunlin <i>Calidris alpina alpina</i>; eider <i>Somateria mollissima</i>; goldeneye <i>Bucephala clangula</i>; goosander <i>Mergus merganser</i>; grey plover <i>Pluvialis squatarola</i>; greylag goose <i>Anser anser</i>; little tern <i>Sternula albifrons</i>; long-tailed duck <i>Clangula hyemalis</i>; marsh harrier <i>Circus aeruginosus</i>; oystercatcher <i>Haematopus ostralegus</i>; pink-footed goose <i>Anser brachyrhynchus</i>; red-breasted merganser <i>Mergus serrator</i>; redshank <i>Tringa tetanus</i>; sanderling <i>Calidris alba</i>; shelduck <i>Tadorna tadorna</i>; and velvet scoter <i>Melanitta fusca</i>.</p>

<b>Site name: Firth of Tay and Eden Estuary SPA</b>
<p>Conservation objectives:</p> <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"> <li>• Population of the species as a viable component of the site;</li> <li>• Distribution of the species within site;</li> <li>• Distribution and extent of habitats supporting the species;</li> <li>• Structure, function and supporting processes of habitats supporting the species;</li> <li>• No significant disturbance of the species.</li> </ul>
Distance: The SPA is 2.9 km from the application site
<p>Sources of information:</p> <p>Site Citation - <a href="https://sitelink.nature.scot/site/8501">https://sitelink.nature.scot/site/8501</a></p> <p>JNCC Natura 2000 Data Form – <a href="http://archive.jncc.gov.uk/pdf/SPA/UK9004121.pdf">http://archive.jncc.gov.uk/pdf/SPA/UK9004121.pdf</a></p> <p>Conservation Objectives – <a href="https://sitelink.nature.scot/site/8501">https://sitelink.nature.scot/site/8501</a></p> <p>Supplementary advice on condition of features – <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8501">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8501</a></p> <p>Site Improvement Plan – n/a</p>

Table 3: Firth of Tay and Eden Estuary Ramsar site summary information

<b>Site name: Firth of Tay and Eden Estuary Ramsar site</b>
Site code: UK13018
Year designated: 2000
Area: 6918.42 ha
<p>Qualifying interest features:</p> <p>Ramsar criterion 5:</p> <ul style="list-style-type: none"> <li>• Assemblages of international importance: Species with peak counts in winter: 27,028 waterfowl</li> </ul> <p>Ramsar criterion 6:</p> <ul style="list-style-type: none"> <li>• Species/populations occurring at levels of international importance. Qualifying Species/populations with peak counts in winter: pink-footed goose <i>Anser brachyrhynchus</i>; greylag goose <i>Anser anser anser</i>; bar-tailed godwit <i>Limosa lapponica lapponica</i></li> </ul>
<p>Conservation objectives:</p> <p>No specific Ramsar conservation objectives are available. It is assumed that SAC and SPA conservation objectives will apply by default.</p>
Distance: The Ramsar site is 2.9 km from the application site.

<b>Site name: Firth of Tay and Eden Estuary Ramsar site</b>
Sources of information: Site citation - <a href="https://sitelink.nature.scot/site/8425">https://sitelink.nature.scot/site/8425</a> Ramsar Site Information Sheet - <a href="https://sitelink.nature.scot/site/8425">https://sitelink.nature.scot/site/8425</a> Conservation Objectives – n/a Supplementary advice on condition of features – <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8425">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8425</a> Site Improvement Plan – n/a

Table 4: Outer Firth of Forth and St Andrews Bay Complex pSPA summary information

<b>Site name: Outer Firth of Forth and St Andrews Bay Complex pSPA</b>
Site code: UK9020316
Year designated: proposed
Area: 272068.1 ha
Proposed qualifying interest features: <ul style="list-style-type: none"> <li>• Breeding: Arctic tern, Atlantic puffin, common guillemot, common tern, European shag, herring gull, kittiwake, Manx shearwater, Northern gannet;</li> <li>• Non-breeding: black-headed gull, common eider, common goldeneye, common guillemot, common gull, common scoter, European shag, herring gull, kittiwake, little gull, long-tailed duck, razorbill, red-breasted merganser, red-throated diver, Slavonian grebe, velvet scoter.</li> </ul>
The conservation objectives for the Outer Firth of Forth and St Andrews Bay Complex proposed SPA are: 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.
Distance: The pSPA is adjacent to part of the application site.
Sources of information: Site citation - <a href="https://www.nature.scot/outer-firth-forth-and-st-andrews-bay-complex-proposed-marine-spa-supporting-documents">https://www.nature.scot/outer-firth-forth-and-st-andrews-bay-complex-proposed-marine-spa-supporting-documents</a> JNCC Natura 2000 Data Form – n/a Conservation Objectives – <a href="https://www.nature.scot/sites/default/files/2017-11/Marine%20Protected%20Area%20%28Proposed%29%20-%20Advice%20to%20support%20management%20-%20Outer%20Firth%20of%20Forth%20and%20St%20Andrews%20Bay%20Complex.pdf">https://www.nature.scot/sites/default/files/2017-11/Marine%20Protected%20Area%20%28Proposed%29%20-%20Advice%20to%20support%20management%20-%20Outer%20Firth%20of%20Forth%20and%20St%20Andrews%20Bay%20Complex.pdf</a> Supplementary advice to support management – <a href="https://www.nature.scot/outer-firth-forth-and-st-andrews-bay-complex-proposed-marine-spa-supporting-documents">https://www.nature.scot/outer-firth-forth-and-st-andrews-bay-complex-proposed-marine-spa-supporting-documents</a> Site Improvement Plan – n/a

Table 5: River Tay SAC summary information

<b>Site name: River Tay SAC</b>
Site code: UK0030312
Year designated: 2005
Area: 9461.63 ha
<p>Qualifying interest features:</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Atlantic salmon <i>Salmo salar</i></li> </ul> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> <li>• Sea lamprey <i>Petromyzon marinus</i></li> <li>• Brook lamprey <i>Lampetra planeri</i></li> <li>• River lamprey <i>Lampetra fluviatilis</i></li> <li>• Otter <i>Lutra lutra</i></li> </ul>
<p>Conservation objectives:</p> <p>To avoid deterioration of the qualifying habitat 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</p> <p>To ensure for the qualifying habitat that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>• Extent of the habitat on site;</li> <li>• Distribution of the habitat within site;</li> <li>• Structure and function of the habitat;</li> <li>• Processes supporting the habitat;</li> <li>• Distribution of typical species of the habitat;</li> <li>• Viability of typical species as components of the habitat;</li> <li>• No significant disturbance of typical species of the habitat.</li> </ul>
Distance: The downstream limit of the SAC is 26 km to the west of the application site.
<p>Sources of information:</p> <p>Site citation - <a href="https://sitelink.nature.scot/site/8366">https://sitelink.nature.scot/site/8366</a></p> <p>JNCC Natura 2000 Data Form - <a href="http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030312.pdf">http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030312.pdf</a></p> <p>Conservation Objectives - <a href="https://sitelink.nature.scot/site/8366">https://sitelink.nature.scot/site/8366</a></p> <p>Supplementary advice on condition of features - <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8366">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8366</a></p> <p>Site Improvement Plan – n/a</p>

Table 6: Isle of May SAC summary information

<b>Site name: Isle of May SAC</b>
Site code: UK0030172
Year designated: 2005
Area: 356.64 ha
<p>Qualifying interest features:</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Reefs</li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Grey seal <i>Halichoerus grypus</i></li> </ul>
<p>Conservation objectives:</p> <p>To avoid deterioration of the qualifying habitat (listed below) 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</p> <p>To ensure for the qualifying habitat that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>• Extent of the habitat on site;</li> <li>• Distribution of the habitat within site;</li> <li>• Structure and function of the habitat;</li> <li>• Processes supporting the habitat;</li> <li>• Distribution of typical species of the habitat;</li> <li>• Viability of typical species as components of the habitat;</li> <li>• No significant disturbance of typical species of the habitat.</li> </ul>
Distance: The nearest part of the SAC is 36 km to the south-east of the application site.
<p>Sources of information:</p> <p>Site citation - <a href="https://sitelink.nature.scot/site/8278">https://sitelink.nature.scot/site/8278</a></p> <p>JNCC Natura 2000 Data Form - <a href="https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030172.pdf">https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030172.pdf</a></p> <p>Conservation Objectives - <a href="https://sitelink.nature.scot/site/8278">https://sitelink.nature.scot/site/8278</a></p> <p>MPA network advice - <a href="https://www.nature.scot/snh-commissioned-report-547-snh-and-jncc-mpa-network-advice">https://www.nature.scot/snh-commissioned-report-547-snh-and-jncc-mpa-network-advice</a></p> <p>Scotland's Environment Feature Condition – <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8278">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8278</a></p>

Table 7: Barry Links SAC summary information

<b>Site name: Barry Links SAC</b>
Site code: UK0013044
Year designated: 2005
Area: 770.44 ha
<p>Qualifying interest features:</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Embryonic shifting dunes</li> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")</li> <li>• Fixed coastal dunes with herbaceous vegetation ("grey dunes") *Priority feature</li> <li>• Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) *Priority feature</li> <li>• Humid dune slacks</li> </ul>
<p>Conservation objectives:</p> <p>To avoid deterioration of the qualifying habitat 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</p> <p>To ensure for the qualifying habitat that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>• Extent of the habitat on site;</li> <li>• Distribution of the habitat within site;</li> <li>• Structure and function of the habitat;</li> <li>• Processes supporting the habitat;</li> <li>• Distribution of typical species of the habitat;</li> <li>• Viability of typical species as components of the habitat;</li> <li>• No significant disturbance of typical species of the habitat.</li> </ul>
Distance: The nearest part of the SAC is 7.5 km to the east of the application site.
<p>Sources of information:</p> <p>Site citation - <a href="https://sitelink.nature.scot/site/8196">https://sitelink.nature.scot/site/8196</a></p> <p>JNCC Natura 2000 Data Form - <a href="https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0013044.pdf">https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0013044.pdf</a></p> <p>Conservation Objectives - <a href="https://sitelink.nature.scot/site/8196">https://sitelink.nature.scot/site/8196</a></p> <p>Scotland's Environment Condition Feature – <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8196">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8196</a></p>

Table 8: Moray Firth SAC summary information

<b>Site name: Moray Firth SAC</b>
Site code: UK0019808
Year designated: 2005
Area: 151273.99 ha
<p>Qualifying interest features:</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>Sandbanks which are slightly covered by sea water all the time</li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>Bottlenose dolphin <i>Tursiops truncatus</i></li> </ul>
<p>Conservation objectives:</p> <p>To avoid deterioration of the qualifying habitat 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</p> <p>To ensure for the qualifying habitat that the following are maintained in the long term:</p> <ul style="list-style-type: none"> <li>Extent of the habitat on site;</li> <li>Distribution of the habitat within site;</li> <li>Structure and function of the habitat;</li> <li>Processes supporting the habitat;</li> <li>Distribution of typical species of the habitat;</li> <li>Viability of typical species as components of the habitat;</li> <li>No significant disturbance of typical species of the habitat.</li> </ul>
Distance: The nearest part of the SAC is 138 km to the north of the application site.
<p>Sources of information:</p> <p>Site citation - <a href="https://sitelink.nature.scot/site/8327">https://sitelink.nature.scot/site/8327</a></p> <p>JNCC Natura 2000 Data Form - <a href="http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0019808.pdf">http://archive.jncc.gov.uk/ProtectedSites/SACselection/n2kforms/UK0019808.pdf</a></p> <p>Conservation Objectives - <a href="https://sitelink.nature.scot/site/8327">https://sitelink.nature.scot/site/8327</a></p> <p>Supplementary advice on condition of features - <a href="https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8327">https://www.environment.gov.scot/data/data-analysis/protected-nature-sites/?pagenumber=1&amp;resetmap=true&amp;siteid=8327</a></p> <p>Site Improvement Plan – n/a</p>

**Site condition*****Firth of Tay and Eden Estuary SAC***

- 4.4 The Scotland's Environment website indicates that the habitats 'Intertidal mudflats and sandflats' and 'Subtidal sandbanks' are in favourable condition. The habitat 'Estuaries' has not been assessed. The harbour seal population is described as being in unfavourable condition.

***Firth of Tay and Eden Estuary SPA***

- 4.5 The Scotland's Environment website indicates that some bird species are in favourable condition whilst some species are in unfavourable condition. Species populations that are identified as being in unfavourable condition are: common scoter; goldeneye; greylag goose; little tern; long-tailed duck; red-breasted merganser; shelduck; velvet scoter.

***Firth of Tay and Eden Estuary Ramsar***

- 4.6 The Scotland's Environment website indicates that the bird assemblage that the Ramsar is noted for is in favourable condition.

***Outer Firth of Forth and St Andrews Bay pSPA***

- 4.7 This site is currently only proposed and so no information is available on current condition.

***River Tay SAC***

- 4.8 The Scotland's Environment website indicates that all qualifying features are in favourable condition.

***Isle of May SAC***

- 4.9 The Scotland's Environment website indicates that all qualifying features are in favourable condition.

***Barry Links SAC***

- 4.10 The Scotland's Environment website indicates that three of the five qualifying features are in favourable condition and two in unfavourable condition. No information was available to indicate why some features are in unfavourable condition.

***Moray Firth SAC***

- 4.11 The Scotland's Environment website indicates that all qualifying features are in favourable condition.

## 5 Identification of any Likely Significant Effects

- 5.1 The following section of this report carries out the screening of likely significant effects. This fulfils the requirement of Regulation 63 of the Habitats Regulations (as amended) that a proposed project is assessed to determine whether or not it is likely to have a significant effect on the qualifying features (species and habitats) of any European Site, either alone or in combination with other plans or projects.
- 5.2 The proposed development is not directly connected with or necessary to the management of any European Site.
- 5.3 The following European Sites, as described in the earlier section, have been scoped in for consideration for screening for any likely significant effects (for the location of the sites see Figure 2 in Section 7):
- Firth of Tay and Eden Estuary SAC;
  - Firth of Tay and Eden Estuary SPA;
  - Firth of Tay and Eden Estuary Ramsar site;
  - Outer Firth of Forth and St Andrews Bay pSPA;
  - River Tay SAC;
  - Isle of May SAC;
  - Barry Links SAC; and
  - Moray Firth SAC.
- 5.4 The following types of potentially adverse activity, as described in the earlier section, have been scoped in as a source of any likely significant effects and are included within the screening process set out below in accordance with the requirements of Regulation 63 of the Habitats Regulations (as amended):
- Physical habitat loss – Impacts on habitats, i.e. the loss or destruction of habitats, arising from the proposed development including habitats within European site boundaries and habitats outside European sites that have the potential to be ‘functionally linked’. This includes consideration of the effects of dredging;
  - Physical habitat damage – Impacts on habitats, i.e. temporary / short-term disturbance, arising from the proposed development including habitats within European site boundaries and habitats outside European sites that have the potential to be ‘functionally linked’;
  - Disturbance – Impacts on sensitive species, such as birds, grey seal and harbour seal, due to, for example, noise from working machinery or visible presence of people.
  - Changes in water quality which may arise from the following: potential pollution of surface water from fuel spills; potential release of suspended solids/sediment into the Firth of Tay as a result of the development; the potential release of suspended solids within the coastal environment as a result of dredging at the extraction site; potential release of sediment contamination as a result of seabed disturbance; dust generated from construction works.
- 5.5 The following types of potentially adverse activity have been screened out as a source of any likely significant effects in accordance with the requirements of Regulation 63 of the Habitats Regulations:

- Changes in air quality (emissions): Changes in air quality arising from machinery are not likely to have a significant effect on most marine habitats due to rapid mixing and dispersal and the influence of other chemical sources. Published data (<http://www.apis.ac.uk>, accessed 22 September 2019) indicates that most of the qualifying features of the Firth of Tay and Eden Estuary SAC are not sensitive to aerial pollutants, with the exception of saltmarsh which may be sensitive to increase nitrogen deposition (saltmarsh also supports a number of SPA qualifying species). The results of a previous survey (Royal Haskoning DHV, 2012) indicate that there is no saltmarsh in the vicinity of the proposed development and so effects from nitrogen deposition are not likely. Source attribution data indicate that a significant proportion of nitrogen deposition is derived from agricultural, non-agricultural abatable, non-agricultural non-abatable and transport related sources as well as contributions from Europe. The proposed development will not result in an increase in either road traffic visiting the application site, or in ships using the dock. This is because the Port has permitted development rights to undertake as much activity as they need to meet operational demands, which can therefore increase with or without the proposed development. For this reason significant air quality impacts are unlikely.

- 5.6 Each European Site is assessed in turn with reference to the potentially adverse activity, first considering the site alone and then, if necessary, considering the site in-combination with other plans and projects.
- 5.7 In accordance with the People Over Wind and Sweetman judgement (12 April 2018, C-323/17), the screening for likely significant effects has not relied on avoidance or reduction measures that allow a conclusion of 'no likely significant effect' to be reached. Instead it is accepted that there may be a 'likely significant effect' in the absence of these measures, which triggers the need to move to the next stage, i.e. appropriate assessment.

**Testing for likely significant effects of the project alone**

- 5.8 The screening of each European Site against each potentially adverse activity is set out below in Tables 9 to 16.

Table 9: Screening assessment for Firth of Tay and Eden Estuary SAC

Site:	Interest features:
Firth of Tay and Eden Estuary SAC	<p>Qualifying interest features:</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Estuaries</li> </ul> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Sandbanks which are slightly covered by sea water all the time</li> <li>• Mudflats and sandflats not covered by seawater at low tide</li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Harbour seal <i>Phoca vitulina</i></li> </ul>
Potentially adverse activity:	Assessment:
Physical habitat loss	<p>The proposed development will involve works within the boundary of the SAC, including: the widening of an existing dredged berth, the construction of a suspended quay, and creation of a new berth pocket. This work will necessarily impact on intertidal and benthic habitats adjacent to the application site, i.e. direct impacts within the boundary of the SAC.</p> <p>Taking into account the location and scope of the proposed work and applying the precautionary principle, it is concluded that the proposed development is likely to have a significant effect on the Annex I habitat 'Estuaries', which is a qualifying feature.</p>
Conclusion	Likely significant effect.

Physical habitat damage	The assessment presented for habitat loss (see above) is also relevant when considering habitat damage and disturbance. Taking into account the location and scope of the proposed work and applying the precautionary principle, it is concluded that the proposed development is likely to have a significant effect on the Annex I habitat 'Estuaries', which is a qualifying feature.
Conclusion	Likely significant effect.
Disturbance	Harbour seal is a qualifying feature of the SAC and is known to frequent the Firth of Tay. Consequently the proposed works may result in the disturbance of the species, if present. In particular, applying the precautionary principle underwater noise arising from the proposed development is likely to have a significant effect on the Annex II species harbour seal, which is a qualifying feature.
Conclusion	Likely significant effect.
Changes in water quality	<p>Changes in water quality can potentially occur, for example, as a result of pollution of surface water from the mobilisation of suspended solids within the coastal environment as a result of dredging (leading to impacts on turbidity and potentially dissolved oxygen levels), and release of sediment contamination as a result of seabed disturbance.</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and other port activities contribute to this.</p> <p>Furthermore there is likely to be rapid and extensive mixing, dilution and dispersal of suspended solids due to tidal movements, fluvial flows and wave-related mixing.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on harbour seal, which is a qualifying feature of the SAC. It is also considered that the proposed development is not likely to have a significant effect on the Annex I habitat 'Estuaries', which is a qualifying feature of the SAC.</p>
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of physical habitat loss and damage and disturbance. Appropriate Assessment is therefore required.

Table 10: Screening assessment for Firth of Tay and Eden Estuary SPA

<b>Site:</b>	<b>Interest features:</b>
Firth of Tay and Eden Estuary SPA	<p>Qualifying interest features:</p> <p>Article 4.1:</p> <ul style="list-style-type: none"> <li>Marsh harrier, little tern and bar-tailed godwit.</li> </ul> <p>Article 4.2:</p> <ul style="list-style-type: none"> <li>redshank; greylag goose and pink-footed goose</li> </ul> <p>Article 4.2 assemblage: 48,000 individual waterfowl</p>
<b>Potentially adverse activity:</b>	<b>Assessment:</b>
Physical habitat loss	The nearest part of the SPA is 2.9 km to the east, which is sufficiently distant to make the direct loss of habitats from the SPA highly unlikely. Habitat loss arising from the proposed development is only likely to impact

	<p>on the SPA if the area in the vicinity of the application site is 'functionally linked' to the SPA, i.e. it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the SPA (birds); however, these birds will not be dependent on the benthic habitat that will be affected by activities such as dredging. The SPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders).</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the SPA qualifying features (birds).</p>
Conclusion	<b>No likely significant effect.</b>
Physical habitat damage	<p>The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the SPA (birds); however, these birds will not be dependent on the benthic habitat that will be affected by activities such as dredging. The SPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders).</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the SPA qualifying features (birds).</p>
Conclusion	<b>No likely significant effect.</b>
Disturbance	<p>Disturbance related impacts on the SPA qualifying features, i.e. birds, may extend beyond the application site boundary. Whilst disturbance related impacts on birds are unlikely to extend as far as the nearest part of the Firth of Tay and Eden Estuary SPA, which is 2.9 km to the east, it is possible that disturbance of birds using 'functionally linked areas' may occur (see for example Ruddock &amp; Whitfield, 2007; Laursen, Kahlert &amp; Frikke, 2005; Cutts, Phelps &amp; Burdon, 2009).</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features (birds) of the SPA. Applying the precautionary principle it is considered that the proposed development is likely to have a significant effect on some qualifying features (birds).</p>
Conclusion	<b>Likely significant effect.</b>
Changes in water quality	<p>Changes in water quality can potentially occur as a result of potential pollution of surface water from fuel spills, the mobilisation of suspended solids, dust generation and release of sediment contamination as a result of seabed disturbance.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the SPA (birds); however, these birds will not be dependent on habitats that might be affected by changes in water quality that might arise as a result of activities such as dredging. The SPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders).</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and other port activities contribute to this.</p>

	<p>Furthermore there is likely to be rapid and extensive mixing, dilution and dispersal of suspended solids due to tidal movements, fluvial flows and wave-related mixing.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the qualifying features (birds) of the SPA.</p>
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of disturbance. Appropriate Assessment is therefore required.

Table 11: Screening assessment for Firth of Tay and Eden Estuary Ramsar

Site:	Interest features:
Firth of Tay and Eden Estuary Ramsar	<p>Qualifying interest features:</p> <p>Ramsar criterion 5:</p> <ul style="list-style-type: none"> <li>Assemblages of 27,028 waterfowl</li> </ul> <p>Ramsar criterion 6:</p> <ul style="list-style-type: none"> <li>Internationally important populations of pink-footed goose, greylag goose and bar-tailed godwit</li> </ul>
Potentially adverse activity:	Assessment:
Physical habitat loss	See Table 10 – the screening assessment for likely significant effects on the Ramsar site is the same as reported for the Firth of Tay and Eden Estuary SPA.
Conclusion	No likely significant effect.
Physical habitat damage	See Table 10 – the screening assessment for likely significant effects on the Ramsar site is the same as reported for the Firth of Tay and Eden Estuary SPA.
Conclusion	No likely significant effect.
Disturbance	See Table 10 – the screening assessment for likely significant effects on the Ramsar site is the same as reported for the Firth of Tay and Eden Estuary SPA.
Conclusion	Likely significant effect.
Changes in water quality	See Table 10 – the screening assessment for likely significant effects on the Ramsar site is the same as reported for the Firth of Tay and Eden Estuary SPA.
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of disturbance. Appropriate Assessment is therefore required.

Table 12: Screening assessment for Outer Firth of Forth and St Andrews Bay pSPA

Site:	Interest features:
Outer Firth of Forth and St Andrews Bay pSPA	<p>Qualifying interest features:</p> <ul style="list-style-type: none"> <li>• Breeding: Arctic tern, Atlantic puffin, common guillemot, common tern, European shag, herring gull, kittiwake, Manx shearwater, Northern gannet;</li> <li>• Non-breeding: black-headed gull, common eider, common goldeneye, common guillemot, common gull, common scoter, European shag, herring gull, kittiwake, little gull, long-tailed duck, razorbill, red-breasted merganser, red-throated diver, Slavonian grebe, velvet scoter.</li> </ul>
Potentially adverse activity:	Assessment:
Physical habitat loss	<p>The nearest part of the pSPA is adjacent to the south-east corner of the application site. Habitat loss arising from the proposed development may impact on the pSPA if the area in the vicinity of the application site is used by any qualifying features (birds), including areas that are 'functionally linked' to the SPA, i.e. they provide an important role in maintaining or restoring the population of qualifying species at favourable conservation status.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the pSPA (birds); however, the pSPA birds will not be dependent on the benthic habitat that will be affected by activities such as dredging. The pSPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders). Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the qualifying features (birds) if they are present locally.</p>
Conclusion	No likely significant effect.
Physical habitat damage	<p>The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the pSPA (birds); however, the pSPA birds will not be dependent on the benthic habitat that will be affected by activities such as dredging. The pSPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders).</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the qualifying features (birds) if they are present locally.</p>
Conclusion	No likely significant effect.
Disturbance	<p>Disturbance related impacts on the pSPA qualifying features (birds), may extend beyond the application site boundary. Disturbance related impacts on birds may extend as far as the nearest part of the pSPA or on 'functionally linked areas' (see for example Ruddock &amp; Whitfield, 2007; Laursen, Kahlert &amp; Frikke, 2005; Cutts, Phelps &amp; Burdon, 2009).</p> <p>It is possible that the Firth of Tay and associated intertidal areas in the vicinity of the application site could be used by some of the qualifying features (birds) of the pSPA. Applying the precautionary principle it is considered that the proposed development is likely to have a significant effect on some qualifying features (birds).</p>
Conclusion	Likely significant effect.

<p>Changes in water quality</p>	<p>Changes in water quality can potentially occur as a result of potential pollution of surface water from, for example, the mobilisation of suspended solids, dust generation and release of sediment contamination as a result of seabed disturbance.</p> <p>It is possible that the Firth of Tay and associated intertidal areas could be used by some of the qualifying features of the pSPA (birds); however, these birds will not be dependent on habitats that might be affected by changes in water quality that might arise as a result of activities such as dredging. The pSPA qualifying features will utilise terrestrial, intertidal and pelagic areas for feeding (none are benthic feeders).</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and other port activities contribute to this.</p> <p>Furthermore there is likely to be rapid and extensive mixing, dilution and dispersal of suspended solids due to tidal movements, fluvial flows and wave-related mixing.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the qualifying features (birds) of the pSPA.</p>
<p>Conclusion</p>	<p>No likely significant effect.</p>
<p>Overall conclusion</p>	<p>The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of disturbance. Appropriate Assessment is therefore required.</p>

Table 13: Screening assessment for River Tay SAC

Site:	Interest features:
<p>River Tay SAC</p>	<p>Qualifying interest features:</p> <p>Annex I habitats (not a primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>• Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></li> </ul> <p>Annex II species (primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>• Atlantic salmon</li> </ul> <p>Annex II species (not a primary reason for site selection0</p> <ul style="list-style-type: none"> <li>• Sea lamprey</li> <li>• Brook lamprey</li> <li>• River lamprey</li> <li>• Otter</li> </ul>
Potentially adverse activity:	Assessment:
<p>Physical habitat loss</p>	<p>The nearest part of the River Tay SAC is 26 km to the west of the application site and consequently there is no mechanism by which direct habitat loss can occur. The qualifying features of the SAC include three migratory fish species that use the Firth of Tay when moving between the freshwater and marine environments: Atlantic salmon, river lamprey and sea lamprey. Consequently the Firth of Tay may be functionally linked to the SAC with respect to fish migration.</p> <p>The proposal includes dredging and disposal of dredged material, which has the potential to impact on migratory fish. As set out in the ERM (2019)</p>

	<p>BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. This dredge would increase the depth within the wharves to 9.5 m and 10 m below Chart Datum respectively. The proposed dredging schedule will be dependent on the licence award date, dredger availability and construction periods. The length of the campaign will be largely dependent on when the dredger is available, and it is possible that dredging could take place at different times depending on the work required to create the berths.</p> <p>During the construction and operation phases of the development, habitat loss will be limited to benthic material (primarily as a result of dredging work) and very small areas of intertidal/shoreline habitats (the intertidal area adjacent to the application site mostly consists of rock armour, concrete slabs etc.). It is highly unlikely that these areas provide important habitat for migratory fish. The application site is located adjacent to the Firth at a point where it is 1.4 km wide. Consequently the predicted habitat loss is not likely to impact on the ability of migratory fish to use the Firth.</p> <p>Taking into account the location and scope of the proposed work and applying the precautionary principle, it is concluded that the proposed development is not likely to have a significant effect on the migratory fish species that are qualifying features of the SAC.</p>
Conclusion	No likely significant effect.
Physical habitat damage	The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.
Conclusion	No likely significant effect.
Disturbance	Underwater noise, e.g. from impact piling, could affect migratory fish by causing disturbance, which may result in increased mortality or displacement of animals. Taking into account the location and scope of the proposed work and applying the precautionary principle, it is concluded that the proposed development is likely to have a significant effect on the migratory fish species that are qualifying features of the SAC.
Conclusion	Likely significant effect.
Changes in water quality	<p>Changes in water quality can potentially occur as a result of pollution of surface water from, for example, the mobilisation of suspended solids within the coastal environment as a result of dredging (leading to impacts on turbidity and potentially dissolved oxygen levels), and release of sediment contamination as a result of seabed disturbance.</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and other port activities contribute to this.</p> <p>The Firth of Tay is described as being relatively shallow and partially mixed to well-mixed (Bates <i>et al</i>, 2004; Royal Haskoning DHV, 2013). The significant freshwater influence and macro-tidal (more than 4m tidal range) nature of the Firth, means that the residence time of water in the Firth is relatively short (2-15 days). This means that any material discharged to the Firth is rapidly diluted and discharged to sea (Royal Haskoning DHV, 2013).</p> <p>ERM (2019) sampled the sediments within Caledon East Wharf and Prince Charles Wharf in June 2019. Analysis of the sediments found that there</p>

	<p>are elevated concentrations of some metals and Polycyclic Aromatic Hydrocarbons (PAHs) within the dredged material above Action Level 1<sup>2</sup>, consistent with historic industrial discharges to the Firth of Tay. No samples recorded concentrations of contaminants above Marine Scotland Action Level 2.</p> <p>Dredging is already an activity undertaken at the Port and the proposed dredging will be undertaken in accordance with the current dredging regime, therefore not significantly increasing dredging activity.</p> <p>As set out in the ERM (2019) BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. The dredged material will be deposited at the Middle Bank spoil ground and so there will be no overall change in local sediment supply within the outer Firth of Tay (the material has been sampled, analysed and confirmed to be suitable for sea disposal as the Best Practicable Environmental Option). As dredging will take place intermittently within an environment that is characterised by powerful tidal currents and a high suspended sediment load, it is considered that this is not likely to have a significant effect on the SAC.</p> <p>The BPEO report (ERM, 2019) concludes that disposal at sea is the preferred option for dredged material. The report notes that the disposal operations may cause the occasional exceedance of Environmental Quality Standards and failure to meet Water Framework Directive (WFD) objectives, although it is concluded that this would be localised and short-term.</p> <p>The BPEO report also notes that the disposal operations may affect the benthic fauna in proximity to the disposal site due to sediment drifting from the disposal area itself. It is anticipated that there will not be any significant impact on the Tay marine ecosystem as a whole given the scale and duration of effects. There may be some short term effects, such as displacement on migrating fish due to increased turbidity caused by the discharge of dredged material into the water column, but these impacts are not predicted to cause mortality or alter the viability of populations. Under the disposal proposed, cumulative impacts with other operations are not predicted to create a significant impact to the SAC or marine ecosystem.</p> <p>It is concluded that the proposed work will impact on baseline conditions that are already subject to the effects of on-going dredging and other activities. Consequently, the effect on SAC qualifying features will be minimal due to the relatively small scale and duration of the works, and the effects of dilution and dispersal in the receiving environment. The proposed work will not have an adverse effect on the qualifying features of the SAC, i.e. Oligotrophic to mesotrophic standing waters, Atlantic salmon, lampreys and otter.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the qualifying features of the SAC, in particular migratory fish.</p>
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of disturbance. Appropriate Assessment is therefore required.

<sup>2</sup> Action Levels for metals, PCBs, TBT and PAHs are used by Marine Scotland to assess the suitability for disposal of sediments at sea.

Table 14: Screening assessment Isle of May SAC

Site:	Interest features:
Isle of May SAC	<p>Qualifying interest features:</p> <ul style="list-style-type: none"> <li>Annex I habitats (not a primary reason for selection of this site):               <ul style="list-style-type: none"> <li>• Reefs</li> </ul> </li> <li>Annex II species (a primary reason for selection of this site):               <ul style="list-style-type: none"> <li>• Grey seal <i>Halichoerus grypus</i></li> </ul> </li> </ul>
Potentially adverse activity:	Assessment:
Physical habitat loss	<p>The nearest part of the Isle of May SAC is 36 km to the south-east of the application site and consequently there is no mechanism by which direct habitat loss can occur. Habitat loss arising from the proposed development is only likely to impact on the SAC if the area in the vicinity of the application site is 'functionally linked' to the SAC, i.e. it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status.</p> <p>The qualifying features of the SAC include breeding grey seal. It is reported that about a hundred grey seals live around the island all year, but the numbers swell significantly when they return to the island to pup and mate between late September and January. As the Isle of May is 36 km from the application site, the Firth of Tay adjacent to the application site is not likely to be functionally linked to the SAC.</p> <p>The grey seal is a species that is known to be present in the Firth of Tay outside the breeding period (Duck &amp; Morris, 2014). Count data are available for the Firth of Tay and these are broken down into count sectors as follows:</p> <ul style="list-style-type: none"> <li>• Upper Tay – 0 to a peak count of 110 in 2013</li> <li>• Broughty Ferry – 0 to a peak count of 16 in 2003</li> <li>• Buddon Ness – 0 to a peak count of 104 in 1994</li> <li>• Abertay &amp; Tentsmuir – 323 to a peak count of 2,088 in 2000</li> </ul> <p>These data indicate that the Firth of Tay is used by a relatively small number of grey seals outside the breeding period. This is supported by research carried out by Sea Mammal Research Unit Ltd (Sparling et al., 2012) for the Forth and Tay Offshore Wind Developers Group.</p> <p>A study of the grey seal population of the Moray Firth (Thompson et al., 1996) found that this species showed seasonal variation in numbers, with individuals moving to haul-out sites 125 km – 365 km away from the Firth. As grey seal can potentially range over large distances, and taking into account the local distribution in the Firth of Tay (where numbers are greatest at Abertay &amp; Tentsmuir, approximately 6.5 km to the south-east of the application site) it is considered unlikely that the section of the Firth of Tay in the vicinity of Port of Dundee is functionally linked to the SAC.</p> <p>As set out in the ERM (2019) BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. This dredge would increase the depth within the wharves to 9.5 m and 10 m below Chart Datum respectively. The proposed dredging schedule will be dependent on the licence award date, dredger availability and construction periods. The length of the campaign will be largely dependent on when the dredger is available, and it is possible that dredging could take place at different times depending on the work required to create the berths.</p>

	<p>During the construction and operation phases of the development, habitat loss will be limited to benthic material (primarily as a result of dredging work) and very small areas of intertidal/shoreline habitats (the intertidal area adjacent to the application site mostly consists of rock armour, concrete slabs etc.). It is highly unlikely that these areas provide important habitat for grey seal or their prey species. The application site is located adjacent to the Firth at a point where it is 1.4 km wide. Consequently the predicted habitat loss is not likely to impact on the ability of grey seal to use the Firth.</p>
Conclusion	<b>No likely significant effect.</b>
Physical habitat damage	The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.
Conclusion	<b>No likely significant effect.</b>
Disturbance	<p>The proposed works, including the widening of the existing dredged berth; slab thickening to the existing Prince Charles Wharf to increase quay capacity; a proposed suspended quay on land to the west of Prince Charles Wharf to accommodate Ro-Ro Vessels; and creation of a new berth pocket to the south of the proposed suspended quay may result in the disturbance of grey seal using the Firth of Tay.</p> <p>As noted above, grey seal can potentially range over large distances and has a local distribution in the Firth of Tay where numbers are greatest at Abertay &amp; Tentsmuir, approximately 6.5 km to the south-east of the application site. It is therefore considered unlikely that the section of the Firth of Tay in the vicinity of Port of Dundee is functionally linked to the SAC.</p> <p>Whilst harbour seals (and grey seals) are reported to forage throughout the outer Firth of Tay, including the area near the application site, SLR (SLR, 2015) concluded that '<i>The very small temporary loss of benthic habitat through the proposed capital dredging is not likely to affect the foraging resource for harbour seals. Similarly suspended sediment concentrations are not likely to be significantly different from current levels so prey resources for harbour seals will not be significantly affected.</i>' This conclusion is also relevant when considering impacts on grey seal.</p> <p>Piling works and works to the quay walls may result in some underwater noise. There is evidence that underwater noise can impact on harbour seal: for example, a study conducted at an offshore wind farm found that during piling, seal usage (abundance) was significantly reduced up to 25 km from the piling activity; within 25 km of the centre of the wind farm, there was a 19 to 83% (95% confidence intervals) decrease in usage compared to during breaks in piling (Russell <i>et al</i>, 2016).</p> <p>If it is assumed that grey seal may be affected in a similar way to harbour seal, underwater noise arising from the proposed development is unlikely to impact on breeding grey seal: the SAC is 36 km to the south-east, which is beyond the distance over which noise impacts were reported in published research). Furthermore piling work will be temporary and short-term in nature. In the absence of mitigation it is considered that underwater noise is not likely to have a significant effect on grey seal.</p>
Conclusion	<b>No likely significant effect.</b>
Changes in water quality	<p>Changes in water quality can potentially occur as a result of pollution of surface water from fuel spills, the mobilisation of suspended solids within the coastal environment as a result of dredging (leading to impacts on turbidity and potentially dissolved oxygen levels), and release of sediment contamination as a result of seabed disturbance.</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended</p>

	<p>sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and other port activities contribute to this.</p> <p>As the SAC is 36 km from the application site, it is considered very unlikely that changes in water quality arising from the proposed development will extend that far due to dilution effects and the influence of currents and tides.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on grey seal, which is a qualifying feature of the SAC..</p>
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, is not likely to have a significant effect on this European Site and its interest features. Appropriate Assessment is therefore not required.

Table 15: Screening assessment for Barry Links SAC

<b>Site:</b>	<b>Interest features:</b>
Barry Links SAC	<p>Qualifying interest features:</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Embryonic shifting dunes</li> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")</li> <li>• Fixed coastal dunes with herbaceous vegetation ("grey dunes") *Priority feature</li> <li>• Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) *Priority feature</li> <li>• Humid dune slacks</li> </ul>
<b>Potentially adverse activity:</b>	<b>Assessment:</b>
Physical habitat loss	<p>The nearest part of the Barry Links SAC is 7.5 km to the east of the application site and consequently there is no mechanism by which direct habitat loss can occur.</p> <p>As set out in the ERM (2019) BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. The dredged material will be deposited at the Middle Bank spoil ground and so there will be no overall change in local sediment supply within the outer Firth of Tay.</p> <p>The BPEO report (ERM, 2019) concludes that disposal at sea is the preferred option for dredged material. The report notes that the disposal operations may cause the occasional exceedance of Environmental Quality Standards and failure to meet Water Framework Directive (WFD) objectives, although it is concluded that this would be localised and short-term.</p> <p>The BPEO report also notes that the disposal operations may affect the benthic fauna in proximity to the disposal site due to sediment drifting from the disposal area itself. It is anticipated that there will not be any significant impact on the Tay marine ecosystem as a whole given the scale and duration of effects. There may be some short term effects, such as displacement on migrating fish due to increased turbidity caused by the discharge of dredged material into the water column, but these impacts are not predicted to cause mortality or alter the viability of populations. Under the disposal proposed, cumulative impacts with other operations are not</p>

	<p>predicted to create a significant impact to the SAC or marine ecosystem.</p> <p>Barry Links SAC is located 7.5 km to the east of the proposed development, and so there is no mechanism by which an impact could occur (the SAC is noted for coastal dune heathland, dunes and dune slacks). The proposed development will involve the dredging and disposal of dredged material. Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the dune habitats that are qualifying features of the SAC.</p>
Conclusion	<b>No likely significant effect.</b>
Physical habitat damage	The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.
Conclusion	<b>No likely significant effect.</b>
Changes in water quality	<p>Changes in water quality will not have an effect on the dune habitats that are qualifying features of the SAC. These habitats have formed above Mean High Water Springs and therefore there is no direct influence from marine water.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on the dune habitats that are qualifying features of the SAC.</p>
Conclusion	<b>No likely significant effect.</b>
Overall conclusion	<b>The development of the application site, when considered alone, is not likely to have a significant effect on this European Site and its interest features. Appropriate Assessment is therefore not required.</b>

Table 16: Screening assessment for Moray Firth SAC

<b>Site:</b>	<b>Interest features:</b>
Moray Firth SAC	<p>Qualifying interest features:</p> <p>Annex I habitats (not a primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>Sandbanks which are slightly covered by sea water all the time</li> </ul> <p>Annex II species (primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>Bottlenose dolphin</li> </ul>
<b>Potentially adverse activity:</b>	<b>Assessment:</b>
Physical habitat loss	<p>The nearest part of the Moray Firth SAC is 138 km to the north of the application site and consequently there is no mechanism by which direct habitat loss can occur. Habitat loss arising from the proposed development is only likely to impact on the SAC if the area in the vicinity of the application site is 'functionally linked' to the SAC, i.e. it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status.</p> <p>The qualifying features of the SAC include bottlenose dolphins that are understood to occasionally use the Firth of Tay (Royal Haskoning DHV, 2013). Consequently it is possible that the Firth is functionally linked to the SAC.</p> <p>The bottlenose dolphins found in the Moray Firth SAC are part of a Scottish east coast population of approximately 200 animals that ranges south past Aberdeen to the Firths of Tay and Forth (Quick <i>et al</i>, 2014). A review of population data indicates that in the Tayside and Fife area dolphins were encountered more often in and around the Firth of Tay in waters less than 20 m deep and within 2 km of the coast.</p> <p>The Firth of Tay has consistently high encounter rates of bottlenose</p>

	<p>dolphins over the years: between 71 and 91 bottlenose dolphins from the east coast population were estimated to be using the Tay area during 2009-2013, representing approximately 35-46% of the total Scottish east coast population. The data indicate that dolphins are regularly recorded in the Firth of Tay in the vicinity of Tayport (the data do not provide any finer resolution than this).</p> <p>As set out in the ERM (2019) BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. This dredge would increase the depth within the wharves to a maximum of 10 m below CD. The proposed dredging schedule will be dependent on the licence award date, dredger availability and construction periods. The length of the campaign will be largely dependent on when the dredger is available, and it is possible that dredging could take place at different times depending on the work required to create the berths.</p> <p>During the construction and operation phases of the development, habitat loss will be limited to benthic material (primarily as a result of dredging work) and very small areas of intertidal/shoreline habitats (the intertidal area adjacent to the application site mostly consists of rock armour, concrete slabs etc.). It is highly unlikely that these areas provide important habitat for bottlenose dolphin or their prey species. The application site is located adjacent to the Firth at a point where it is 1.4 km wide. Consequently the predicted habitat loss is not likely to impact on the ability of dolphin to use the Firth. The proposed work is not likely to have a significant effect on the qualifying features of the SAC.</p>
Conclusion	<b>No likely significant effect.</b>
Physical habitat damage	The disturbance and damage of habitats during the construction and operation phases are expected to have similar impacts as those described above when considering the impacts arising from habitat loss.
Conclusion	<b>No likely significant effect.</b>
Disturbance	<p>Underwater noise, e.g. from impact piling, could affect bottlenose dolphin by causing disturbance, which may result in increased mortality or displacement of animals. Levels of noise and vibration in close proximity to marine piling activities may cause traumatic hearing damage (SLR, 2015). Displacement effects can potentially be wide ranging due to the propagation of noise through water.</p> <p>Applying the precautionary principle it is considered that the proposed development is likely to have a significant effect on bottlenose dolphin, which is a qualifying feature of the SAC.</p>
Conclusion	<b>Likely significant effect.</b>
Changes in water quality	<p>The Firth of Tay is described as being relatively shallow and partially mixed to well-mixed (Bates <i>et al</i>, 2004; Royal Haskoning DHV, 2013). The significant freshwater influence and macro-tidal (more than 4m tidal range) nature of the Firth, means that the residence time of water in the Firth is relatively short (2-15 days). This means that any material discharged to the Firth is rapidly diluted and discharged to sea (Royal Haskoning DHV, 2013).</p> <p>Changes in water quality can potentially occur as a result of pollution of surface water from fuel spills, the mobilisation of suspended solids within the coastal environment as a result of dredging (leading to impacts on turbidity and potentially dissolved oxygen levels), and release of sediment contamination as a result of seabed disturbance.</p> <p>Whilst it is likely that the proposed dredging will re-suspend sediment within the water column, there are already high existing levels of suspended sediments as a result of natural processes of sediment suspension and transport within the Firth of Tay (Bates <i>et al</i>, 2004). On-going dredging and</p>

	<p>other port activities contribute to this.</p> <p>ERM (2019) sampled the sediments within Caledon East Wharf and Prince Charles Wharf in June 2019. Analysis of the sediments found that there are elevated concentrations of some metals and Polycyclic Aromatic Hydrocarbons (PAHs) within the dredged material above Action Level 1<sup>3</sup>, consistent with historic industrial discharges to the Firth of Tay. No samples recorded concentrations of contaminants above Marine Scotland Action Level 2.</p> <p>The proposed development will involve the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. This dredge would increase the depth within the wharves to 9.5 m and 10 m below Chart Datum respectively. As dredging will take place intermittently within an environment that is characterised by powerful tidal currents and a high suspended sediment load, it is considered that this is not likely to have a significant effect on the qualifying feature of the SAC (bottlenose dolphin).</p> <p>Dredging is already an activity undertaken at the Port and the proposed dredging will be undertaken in accordance with the current dredging regime, therefore not significantly increasing dredging activity. Dredged materials will be disposed of at the designated Middle Bank disposal site (the material has been sampled, analysed and confirmed to be suitable for sea disposal as the Best Practicable Environmental Option).</p> <p>It is concluded that the proposed work will impact on baseline conditions that are already subject to the effects of on-going dredging and other activities. Consequently, the effect on the SAC qualifying feature will be minimal due to the relatively small scale and duration of the works, and the effects of dilution and dispersal in the receiving environment.</p> <p>Applying the precautionary principle it is considered that the proposed development is not likely to have a significant effect on bottlenose dolphin, which is a qualifying feature of the SAC.</p>
Conclusion	No likely significant effect.
Overall conclusion	The development of the application site, when considered alone, will have a likely significant effect on this European Site and its interest features as a result of disturbance. Appropriate Assessment is therefore required.

**Summary of Likely Significant Effects**

- 5.1 The assessment of the project alone has concluded that the proposed development will have a likely significant effect on various European sites and their interest features. A summary of the assessment of likely significant effect is presented in Table 17. This assessment has been carried out in the absence of mitigation measures and is therefore compliant with the requirements of the judgement People Over Wind and Sweetman (12 April 2018, C-323/17). The conclusion that the proposed work will result in likely significant effects means that this HRA needs to progress to the next stage, which is the appropriate assessment.

<sup>3</sup> Action Levels for metals, PCBs, TBT and PAHs are used by Marine Scotland to assess the suitability for disposal of sediments at sea.

Table 17: Summary of the assessment of likely significant effect

European site	Is the proposed development likely to have a significant effect on the qualifying features through these impact mechanisms?			
	Habitat loss	Habitat damage	Disturbance	Water Quality
Firth of Tay and Eden Estuary SAC	Yes	Yes	Yes	No
Firth of Tay and Eden Estuary SPA	No	No	Yes	No
Firth of Tay and Eden Estuary Ramsar	No	No	Yes	No
Outer Firth of Forth and St Andrews Bay pSPA	No	No	Yes	No
River Tay SAC	No	No	Yes	No
Isle of May SAC	No	No	No	No
Barry Links SAC	No	No	No	No
Moray Firth SAC	No	No	Yes	No

## 6 Appropriate Assessment

6.1 The test of ‘likely significant effect’ set out within Section 5 of this report has identified the following European sites that need to be taken forward for appropriate assessment:

- Firth of Tay and Eden Estuary SAC
- Firth of Tay and Eden Estuary SPA
- Firth of Tay and Eden Estuary Ramsar
- Outer Firth of Forth and St Andrews Bay pSPA
- River Tay SAC
- Moray Firth SAC

6.2 As the proposed development is not directly connected with or necessary to the management of any of these European sites (Regulation 48(1)(b) it is concluded that it is necessary to make an appropriate assessment of the implications for each site in view of that site’s conservation objectives (Regulation 48(1)). An appropriate assessment has therefore been completed for each of these European Site against each potentially adverse activity. The results of the individual assessments are set out below in Tables 18 to 23.

Table 18: Assessment of effects on Firth of Tay and Eden Estuary SAC

Site:	Interest features:
Firth of Tay and Eden Estuary SAC	<p>Qualifying interest features:</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Estuaries</li> </ul> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Sandbanks which are slightly covered by sea water all the time</li> <li>• Mudflats and sandflats not covered by seawater at low tide</li> </ul> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>• Harbour seal <i>Phoca vitulina</i></li> </ul>
Potentially adverse activity:	Assessment:
Physical habitat loss	<p>The proposed development will involve works within the boundary of the SAC, including: the widening of the existing dredged berth associated with the Prince Charles Wharf Extension from 200m x 40m to 200m x 60m, where the depth of the berth would increase to -10.0mCD (Chart Datum); a proposed suspended quay on land to the west of Prince Charles Wharf; and creation of a new berth pocket to the south of the proposed suspended quay. The proposed berth pocket would be 170m x 30m and is proposed to be dredged to a depth of -9.0mCD. This work will necessarily impact on intertidal and benthic habitats adjacent to the application site.</p> <p>Bates <i>et al</i> (2004) reports that the Firth of Tay is ‘characterised by powerful tidal currents and a high suspended sediment load. It is overwhelmingly dominated by sediment biotopes. The subtidal sediments of the main river channels tend to be mobile with a relatively impoverished fauna.’ In the vicinity of the application site Bates <i>et al</i> (2004) observe that ‘<i>natural shores are completely replaced by the vertical stone and wood wharfs of Dundee docks</i>’.</p> <p>Published data show that the benthic habitat that will be affected by the proposed development is Eunis A5.326 ‘Oligochaetes in variable or reduced</p>

	<p>salinity infralittoral muddy sediment'. Previous work undertaken by SLR (SLR, 2015) noted that <i>'the current maintenance dredging activities at the site are typically carried out in the summer / autumn months, subject to dredger availability, and last for approximately three to five 24-hour working days with the dredged material deposited at the Middle Bank spoil ground'</i>. Current dredging activity is therefore limited in its duration and only impacts on sediments that support low biotic diversity. A similar impact is anticipated for the proposed future dredging.</p> <p>It is expected that a similar dredging regime will apply to the proposed development. As set out in the ERM (2019) BPEO Report, the proposal includes the dredging and disposal of a maximum of 75,000 m<sup>3</sup> of dredged material as part of a capital dredge within Caledon East Wharf and Prince Charles Wharf. This dredge would increase the depth within the wharves to a maximum depth of -10 m CD. The proposed dredging schedule will be dependent on the licence award date, dredger availability and construction periods. The length of the campaign will be largely dependent on when the dredger is available, and it is possible that dredging could take place at different times depending on the work required to create the berths.</p> <p>The proposed dredging is not likely to impact on harbour seal, which is not directly dependent on the sediment that will be affected by this activity. It is also considered unlikely that indirect impacts will occur as the dredging activity is unlikely to have a significant effect on prey availability in the vicinity of the application site.</p> <p>It is concluded that the proposed work will impact on baseline conditions that are already subject to the effects of on-going dredging activities. As dredging is only likely to be required for a limited period of time (and for a fixed volume of dredged material), the impact on the Firth of Tay is expected to be negligible. The proposed work will not have an adverse effect on the qualifying features of the SAC, i.e. Annex I habitats that are a primary reason for selection of this site: Estuaries, Sandbanks slightly covered by sea water all the time, Mudflats and sandflats not covered by seawater at low tide, and Harbour seal.</p>
<p>Conclusion</p>	<p><b>No adverse effect on the integrity of the SAC.</b></p>
<p>Physical habitat damage</p>	<p>The proposed development will involve works within the boundary of the SAC. Whilst this will result in some habitat loss (benthic sediments and existing hard engineering used as bank revetment) there is also the potential for habitat damage or disturbance to occur. The scope for such impacts are reduced by the existing alignment of the port and quay walls, the port having previously been expanded southwards into the Firth of Tay to provide access to deeper water. Consequently the shoreline area mostly consists of rock armour, sheet piling, concrete slabs etc that are covered and uncovered by the flooding and ebbing tides respectively.</p> <p>The assessment presented for habitat loss (see above) is also relevant when considering habitat damage and disturbance. In summary the proposed works will only impact on the subtidal sediments of the Firth of Tay, which tend to be mobile with a relatively impoverished fauna. It is concluded that the proposed work will impact on baseline conditions that are already subject to the effects of on-going dredging activities. As dredging is only likely to be required for a limited period of time (and for a fixed volume of dredged material), the impact on the Firth of Tay is expected to be negligible. The proposed work will not have an adverse effect on the qualifying features of the SAC, i.e. Estuaries, Sandbanks slightly covered by sea water all the time, Mudflats and sandflats not covered by seawater at low tide, and Harbour seal.</p>
<p>Conclusion</p>	<p><b>No adverse effect on the integrity of the SAC.</b></p>
<p>Disturbance</p>	<p>Harbour seal is a qualifying feature of the SAC and the proposed works, including the widening of the existing dredged berth; slab thickening to the</p>

<p>existing Prince Charles Wharf to increase quay capacity; a proposed suspended quay on land to the west of Prince Charles Wharf to accommodate Ro-Ro Vessels; and creation of a new berth pocket to the south of the proposed suspended quay, may result in the disturbance of the species, if present.</p> <p>The JNCC (<a href="https://sac.jncc.gov.uk/species/S1365/">https://sac.jncc.gov.uk/species/S1365/</a>, accessed 22 October 2019) reports that the European population of harbour seal has shown a marked recovery after being reduced by a viral epidemic in the late 1980s. Thompson <i>et al</i> (2019) report that their study results indicate that the current UK harbour seal population is similar to estimates from the late 1990s, but there were significant declines in some subpopulations and increases in others.</p> <p>Published data indicate that numbers of harbour seals in the Firth of Tay are below peak counts. This species has previously been reported to be numerous in the Middle Tay, but there are no records of significant presence at Stannergate, i.e. in the vicinity of the application site. Preferred haul-outs have been noted in Invergowrie Bay, My Lords Bank, Naughton Bank and Middle Bank (Royal Haskoning DHV, 2013). The total numbers observed at low tide have previously been in excess of 100 individuals with a peak of 58 recorded on the Naughton Bank.</p> <p>Whilst previous survey indicates that harbour seal have been present in the Middle Tay, the current status at the local level is not known. SNH reports that harbour seals on the east coast of Scotland have seen a serious decline since the mid-1990s, but the reason why is not clear (<a href="https://www.nature.scot/plants-animals-and-fungi/mammals/marine-mammals/seals">https://www.nature.scot/plants-animals-and-fungi/mammals/marine-mammals/seals</a>, accessed 25 October 2019). Several factors may be to blame, including predation, pollution and the effect of climate change on the harbour seal's prey.</p> <p>In 2012, the Sea Mammal Research Unit began a major programme of research to investigate the decline and the Natural Environment Research Council (NERC) appointed the Special Committee on Seals (SCOS) to formulate advice to Government taking into account this research. As part of this research population counts have been carried out and advice published (SCOS Report, 2018). The harbour seal count for the Firth of Tay and Eden Estuary SAC in 2017 was 29, equalling the lowest count (in 2014) for this SAC. This count represents a 95% decrease from the mean counts recorded between 1990 and 2002 (641).</p> <p>During wintering bird survey work carried out by BSG Ecology during the period October 2019 to January 2020, small numbers of seals were recorded in the Firth of Tay near the application site. No seals were recorded during the survey on 30 October 2019; during the survey on 22 November 2019 a peak count of four harbour seals were seen in the Firth of Tay near the Port of Dundee, and one harbour seal was hauled out at Middle Bank (OS grid reference NO40592888); during the survey on 20 December 2019 a peak count of five harbour seals were seen in the Firth of Tay near the Port of Dundee, but none were seen at any of the historical haul-out sites.</p> <p>Previous work undertaken by SLR (SLR, 2015) concluded that significant effects on breeding harbour seal are unlikely because of the location of the development in relation the seal's nearest breeding area, which is on the exposed sandbanks at Tentsmuir, over 7 km east of the Port of Dundee.</p> <p>Whilst seals forage throughout the outer Firth of Tay, including the area near the application site, it was concluded that '<i>The very small temporary loss of benthic habitat through the proposed capital dredging is not likely to affect</i></p>
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	<p><i>the foraging resource for harbour seals. Similarly suspended sediment concentrations are not likely to be significantly different from current levels so prey resources for harbour seals will not be significantly affected.'</i></p> <p>Piling works and works to the quay walls may result in some underwater noise. There is evidence that underwater noise can impact on harbour seal: for example, a study conducted at an offshore wind farm found that during piling, seal usage (abundance) was significantly reduced up to 25 km from the piling activity; within 25 km of the centre of the wind farm, there was a 19 to 83% (95% confidence intervals) decrease in usage compared to during breaks in piling (Russell <i>et al</i>, 2016). Consequently underwater noise arising from the proposed development may result in the displacement of harbour seal (the nearest haul-out is approximately 3 km to the west, which is close enough for noise impacts to occur based on published research). In the absence of mitigation it is considered that underwater noise is likely to have a significant effect on harbour seal.</p> <p>To mitigate impacts on harbour seal, soft start procedures will be used when piling and no more than four hours of impact piling will be undertaken in a 24 hour period. Monitoring using shore-based observation will be carried out at the known harbour seal haul-out locations before piling commences and during the piling work to identify any behavioural changes in the seals that are present. If an adverse effect is detected then appropriate measures will be adopted to mitigate those effects following discussion with SNH.</p> <p>The proposed dredging will be undertaken in accordance with the current dredging regime, therefore, dredging will typically be carried out in the summer / autumn months, subject to dredger availability, and last for approximately three to five 24-hour working days. The dredging represents a short period of temporary works (compared with the capital dredge, which is currently 50 programme days) and consequently the presence of a dredger is unlikely to have a significant disturbing effect that will propagate over large distances. As there is already baseline disturbance associated with boat and ship movements, it is concluded that dredger activity will not have an adverse effect on harbour seal.</p> <p>The proposed work will impact on baseline conditions that are already subject to the effects of on-going dredging activities and noise related impacts associated with the operation of the Port of Dundee. Taking into account the proposed mitigation measures, it is concluded that disturbance caused by the proposed work will not have an adverse effect on harbour seal, which is a qualifying features of the SAC (habitats that are qualifying features will not be affected).</p>
<p>Conclusion</p>	<p>No adverse effect on the integrity of the SAC.</p>
<p>Overall conclusion</p>	<p>The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.</p>

Table 19: Assessment of effects on Firth of Tay and Eden Estuary SPA

Site:	Interest features:
Firth of Tay and Eden Estuary SPA	<p>Qualifying interest features:</p> <p>Article 4.1:</p> <ul style="list-style-type: none"> <li>• Marsh harrier, little tern and bar-tailed godwit.</li> </ul> <p>Article 4.2:</p> <ul style="list-style-type: none"> <li>• redshank; greylag goose and pink-footed goose</li> </ul> <p>Article 4.2 assemblage: 48,000 individual waterfowl</p>
Potentially adverse activity:	Assessment:
Disturbance	<p>Disturbance related impacts on the SPA qualifying features, i.e. birds, are likely to extend beyond the application site boundary. Whilst disturbance related impacts on birds are unlikely to extend as far as the nearest part of the Firth of Tay and Eden Estuary SPA, which is 2.9 km to the east, it is possible that disturbance of birds using 'functionally linked areas' may occur (see for example Ruddock &amp; Whitfield, 2007; Laursen, Kahlert &amp; Frikke, 2005; Cutts, Phelps &amp; Burdon, 2009).</p> <p>The intensity, frequency and duration of a disturbance event will determine whether or not it has the potential to result in the disturbance of birds (SLR, 2015). For example, infrequent, high-intensity activities are more likely to result in disturbance than continuous low-intensity activities. Large amplitude 'startling' noise components are more likely to result in disturbance effects; however, it is also reported that some birds may become habituated to continual noises.</p> <p>A previous noise assessment (Ethos Environmental Ltd, 2012) concluded that the background noise background level is 49.1 dB <math>L_{A90}</math> at the representative residential location. The study also found that <math>L_{AMAX}</math> peaked at 76 dB, indicating that occasional louder noises do occur (this assessment considers noise within terrestrial areas only).</p> <p>Birds may respond to visual disturbance, particularly in situations where such disturbance is rare. Vehicles and vehicle-movements may be tolerated to a greater extent than people (SLR, 2015).</p> <p>Disturbance may result in birds being displaced into alternative habitat further from the source of disturbance. Whilst this may have no discernible effect on the population of the species concerned, interruption of feeding can potentially affect a bird's ability to maintain their energy reserves and therefore an individual's chances of surviving poor weather (SLR, 2015).</p> <p>A previous survey (ECOS Countryside Services LLP, 2011) has revealed that the application site and surrounding area support a range of species, some of which are qualifying species for the Firth of Tay and Eden SPA and Ramsar site. Whilst most species have been recorded in low numbers the surveys have shown that the area is used regularly by moderate numbers of oystercatcher (peak count of 116 in January 2010), turnstone (peak count of 69 in August 2012) and redshank (peak count of 28 in February 2010). Other qualifying species that have been recorded include eider, red-breasted merganser, cormorant and dunlin.</p> <p>The survey data indicate that SPA birds are present, but the relatively small numbers that are present and the frequency of bird presence do not indicate that the area is functionally linked to the SPA and Ramsar, i.e. it is unlikely that the habitat provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status (taking</p>

	<p>into account the area of the SPA / Ramsar, which is over 6,900 ha).</p> <p>This conclusion is supported by the results of survey work carried out in 2019/2020. As noted above (see section 'Potential habitat loss') survey work carried out by BSG Ecology during the period October 2019 to January 2020 recorded small numbers of birds using the Firth of Tay near the application site, including intertidal habitats (i.e. within 1 km). The limited range of species recorded and the small numbers of birds that are present leads to the conclusion that the Firth of Tay in the vicinity of the application site is not functionally linked to the SPA.</p> <p>Noise disturbance is most likely during works involving loud, irregular noise such as piling. Noise disturbance is also possible during dredging (from the operating equipment), though some tolerance may reasonably be expected taking into account current levels of baseline disturbance and existing dredging activities (the Port of Dundee currently has an average of 746 vessel movements per annum (ERM, 2019), as well as permitted development rights to increase operations on an unrestricted basis).</p> <p>There are no known high tide wader roosts on the north shore of the Tay between the Tay Bridge and Broughty Ferry (SLR, 2015). There are no inter-tidal mudflats within the port area, with the closest inter-tidal mudflats used by wading birds located to the east of the application site, between Stannergate and Broughty Ferry (SLR, 2015). Survey in 2013 (Royal Haskoning DHV, 2013) indicates that the intertidal area to the east of the application site comprises mudflats, scattered boulders and cobbles/pebbles. These habitats are used by some SPA qualifying birds, although most are present in relatively small numbers and infrequently. This has been confirmed by surveys carried out by BSG Ecology in 2019/2020 (see section 'Potential habitat loss'). Disturbance impacts to waterbirds are therefore possible for birds using the water adjacent to the application site or using inter-tidal habitats to the east of the port; however, survey data indicate that the numbers that may be affected are small.</p> <p>Overall it is considered that the proposed development is not likely to have a significant effect on SPA qualifying birds as the area supports no more than moderate numbers of a limited range of species. The area already experiences high levels of disturbance associated with the operation of the Port. It is concluded that the proposed work will not have an adverse effect on the qualifying features of the SPA (birds).</p>
Conclusion	No adverse effect on the integrity of the SPA.
Overall conclusion	The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.

Table 20: Assessment of effects on Firth of Tay and Eden Estuary Ramsar

<b>Site:</b>	<b>Interest features:</b>
Firth of Tay and Eden Estuary Ramsar	<p>Qualifying interest features:</p> <p>Ramsar criterion 5:</p> <ul style="list-style-type: none"> <li>Assemblages of 27,028 waterfowl</li> </ul> <p>Ramsar criterion 6:</p> <ul style="list-style-type: none"> <li>Internationally important populations of pink-footed goose, greylag goose and bar-tailed godwit</li> </ul>
<b>Potentially adverse activity:</b>	<b>Assessment:</b>
Disturbance	See Table 19 – the appropriate assessment of effects on the Ramsar site is

	the same as reported for the Firth of Tay and Eden Estuary SPA. It is concluded that the proposed work will not have an adverse effect on the qualifying features of the Ramsar site (birds).
Conclusion	No adverse effect on the integrity of the Ramsar site.
Overall conclusion	The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.

Table 21: Assessment of effects on Outer Firth of Forth and St Andrews Bay pSPA

Site:	Interest features:
Outer Firth of Forth and St Andrews Bay pSPA	<p>Proposed qualifying interest features:</p> <ul style="list-style-type: none"> <li>• Breeding: Arctic tern, Atlantic puffin, common guillemot, common tern, European shag, herring gull, kittiwake, Manx shearwater, Northern gannet;</li> <li>• Non-breeding: black-headed gull, common eider, common goldeneye, common guillemot, common gull, common scoter, European shag, herring gull, kittiwake, little gull, long-tailed duck, razorbill, red-breasted merganser, red-throated diver, Slavonian grebe, velvet scoter.</li> </ul>
Potentially adverse activity:	Assessment:
Disturbance	<p>The intensity, frequency and duration of a disturbance event will determine whether or not it has the potential to result in the disturbance of birds (SLR, 2015). For example, infrequent, high-intensity activities are more likely to result in disturbance than continuous low-intensity activities. Large amplitude ‘startling’ noise components are more likely to result in disturbance effects; however, it is also reported that some birds may become habituated to continual noises. In the absence of baseline noise data for the application site it is assumed that the proposed development will result in potentially disturbing noise events.</p> <p>Birds may respond to visual disturbance, particularly in situations where such disturbance is rare. Vehicles and vehicle-movements may be tolerated much better than people (SLR, 2015).</p> <p>Disturbance may result in birds being displaced into alternative habitat further from the source of disturbance. Whilst this may have no discernible effect on the population of the species concerned, interruption of feeding can potentially affect a bird’s ability to maintain their energy reserves and therefore an individual’s chances of surviving poor weather (SLR, 2015).</p> <p>Noise disturbance is most likely during works involving loud, irregular noise such as piling. Noise disturbance is also possible during dredging (from the operating equipment); however, as this is of a similar noise level to existing vessels using the site some tolerance may reasonably be expected as the continual vessel presence is likely to be regular in character and therefore less likely to cause significant disturbance.</p> <p>Disturbance related impacts on the SPA qualifying features, i.e. birds, are likely to extend beyond the application site boundary. Information published by SNH (SNH, 2006) indicates that the outer Firth of Tay (including the area in the vicinity of the application site) is used by red-throated diver, red breasted merganser, common eider, and potentially common scoter and long-tailed duck.</p> <p>A survey undertaken in 2013 (Royal Haskoning DHV, 2013) indicates that the intertidal area to the east of the application site comprises mudflats,</p>

	<p>scattered boulders and cobbles/pebbles. These habitats are used by some pSPA qualifying birds (eider, goldeneye and red-breasted merganser) albeit in small numbers. The purpose of the pSPA is to protect the feeding grounds and sheltered waters on which the birds depend: whilst some pSPA birds have been recorded in the area the small numbers indicate that this is not an important feeding area. Significant disturbance impacts to pSPA birds are therefore considered unlikely for birds using the water adjacent to the application site or using inter-tidal habitats to the east of the port.</p> <p>Survey work carried out by BSG Ecology during the period October 2019 to January 2020 recorded small numbers of birds using the Firth of Tay near the application site, including intertidal habitats (i.e. within 1 km). During the survey on 30 October 2019 cormorant (peak count 1) and eider duck (peak count 1) were recorded on open water within 1 km of the application site. During the survey on 22 November 2019 species recorded using open water near the application site included red-breasted merganser (peak count 1), goosander (peak count 2) and cormorant (peak count 3). Larger numbers of red-breasted merganser (peak count 8), eider (peak count 3) and a single common scoter were recorded more than 1 km from the application site in the outer Firth. During the survey on 20 December 2019 species recorded using the open water near the application site were goosander (peak count 4), cormorant (peak count 6 in flight) and eider duck (peak count 4).</p> <p>Evaluation of the most recent survey data, complemented by the results of previous surveys (ECOS Countryside Services LLP, 2011) lead to the conclusion that the Firth of Tay in the vicinity of the application site is not used regularly by pSPA qualifying features (birds): the pSPA birds that have been recorded were present in small numbers. Furthermore the temporary nature of the construction work means that there is a reduced likelihood of piling activity giving rise to 'startling' noise. It is concluded that the proposed work will not have an adverse effect on the qualifying features of the SPA (birds).</p>
Conclusion	No adverse effect on the integrity of the pSPA.
Overall conclusion	The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.

Table 22: Assessment of effects on River Tay SAC

<b>Site:</b>	<b>Interest features:</b>
River Tay SAC	<p>Qualifying interest features:</p> <p>Annex I habitats (not a primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></li> </ul> <p>Annex II species (primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>Atlantic salmon</li> </ul> <p>Annex II species (not a primary reason for site selection):</p> <ul style="list-style-type: none"> <li>Sea lamprey</li> <li>Brook lamprey</li> <li>River lamprey</li> <li>Otter</li> </ul>
<b>Potentially adverse activity:</b>	<b>Assessment:</b>
Disturbance	Underwater noise, e.g. from impact piling, could affect migratory fish by causing disturbance, which may result in increased mortality or displacement of animals. Levels of noise and vibration in close proximity to marine piling activities may cause traumatic hearing damage to fish (SLR,

	<p>2015). Displacement effects can potentially be wide ranging due to the propagation of noise through water.</p> <p>Piling will be required as part of the proposed development, which will be a source of noise within the marine environment. Experimental research shows that in a contained situation Atlantic salmon did not perceive pile driving playback noise as a stressor. One explanation that is provided centres on Atlantic salmon hearing ability: this species is particularly sound insensitive lacking specialist hearing mechanisms (Harding <i>et al</i>, 2016). The author's also observe that 'the lack of such mechanisms reduces the fish's sensitivity and bandwidth to detect a noise stimulus, resulting in a poorer ability to distinguish specific acoustic cues from background noise'.</p> <p>Salmon can detect and respond to underwater noise and their audiograms have been well documented (Nedwell <i>et al.</i>, 2004). Salmon are considered to be hearing generalists that are able to hear frequencies in the low to infrasound ranges at threshold levels of around 95 to 130 dB re 1µPa in the region of 10Hz to 380Hz. Small fish i.e. smolts and exceptionally small grilse are generally considered to be most vulnerable to noise impacts (Hastings and Popper, 2005).</p> <p>There are no reported audiograms of lamprey: however, given that they lack any specialist hearing structures, they are considered to be hearing generalists. Studies have shown that sea lamprey respond to frequencies between 20 and 100 Hz (Lenhardt and Sismour, 1995).</p> <p>Mickle <i>et al</i> (2018) found that sea lamprey detected tones of 50–300 Hz with equal sensitivity, but did not detect sounds above 300 Hz. In a laboratory experiment, sea lamprey responded to sound in the range of 50–200 Hz, with a general increase in swimming and a decrease in resting behaviours at both juvenile and adult stages relative to no-sound controls. This indicates that sea lamprey may respond to noise stimuli, such as that derived from marine piling.</p> <p>Noise impacts are also possible from increased dredging operations (from operational equipment), although these are not considered likely to be any greater than noise impacts from existing dredging and other port-related activity. The Port of Dundee currently has an average of 746 vessel movements per annum (ERM, 2019), which means that baseline disturbance levels are already high.</p> <p>To mitigate impacts on migratory fish, soft start procedures will be used when piling and no more than four hours of impact piling will be undertaken in a 24 hour period.</p> <p>The application site is located adjacent to the Firth at a point where it is 1.4 km wide. The predicted noise and vibration is not expected to impact significantly on the ability of fish to migrate upstream and downstream through the Firth; this conclusion takes into account the relatively low sensitivity of salmon and lampreys, the width of the Firth of Tay and the high levels of baseline disturbance that already occur in the absence of development.</p> <p>The proposed work will not have an adverse effect on the qualifying features of the SAC, i.e. Oligotrophic to mesotrophic standing waters, Atlantic salmon, lampreys and otter.</p>
Conclusion	No adverse effect on the integrity of the SAC.
Overall conclusion	The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.

Table 23: Assessment of effects on Moray Firth SAC

Site:	Interest features:
Moray Firth SAC	<p>Qualifying interest features:</p> <p>Annex I habitats (not a primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>• Sandbanks which are slightly covered by sea water all the time</li> </ul> <p>Annex II species (primary reason for selection of this site):</p> <ul style="list-style-type: none"> <li>• Bottlenose dolphin</li> </ul>
Potentially adverse activity:	Assessment:
Disturbance	<p>Underwater noise, e.g. from impact piling, could disturb bottlenose dolphin, which may result in increased mortality or displacement of animals. Levels of noise and vibration in close proximity to marine piling activities may cause traumatic hearing damage (SLR, 2015). Displacement effects can potentially be wide ranging due to the propagation of noise through water.</p> <p>Marine piling will be required as part of the proposed development, which will be a source of marine noise. Graham <i>et al</i> (2017) found that bottlenose dolphins were not excluded from sites in the vicinity of impact piling or vibration piling; nevertheless, some small effects were detected. Bottlenose dolphins spent a reduced period of time in the vicinity of construction works during both impact and vibration piling. The probability of occurrence of this species was also slightly less during periods of vibration piling.</p> <p>David (2006) notes that pile driver-generated noise has the potential to affect dolphin populations adversely as it is detectable up to 40 km from the source. At 9 kHz, this noise is capable of masking strong vocalisations within 10–15 km and weak vocalisations up to approximately 40 km. Similarly Bailey <i>et al</i> (2010) report that for bottlenose dolphins, auditory injury would only have occurred within 100 m of pile-driving works and behavioural disturbance, defined as modifications in behaviour, could have occurred up to 50 km away.</p> <p>Noise impacts are also possible from the dredging operations (from the operation of equipment), although these are not considered likely to be any greater than noise impacts from existing dredging and other port-related activity. The Port of Dundee currently has an average of 746 vessel movements per annum (ERM, 2019), which will result in high baseline disturbance.</p> <p>To mitigate impacts on bottlenose dolphin, soft start procedures will be used when piling and no more than four hours of impact piling will be undertaken in a 24 hour period. Monitoring will be carried out at an appropriate location (to be agreed with SNH) to see if bottlenose dolphin enter the outer Firth of Tay and exhibit any behaviour that indicates disturbance from the piling activity. This would lead to discussion with SNH about the adoption of appropriate mitigation measures (for example, research indicates that a bubble curtain installed around the piling area may be effective - Wursig <i>et al</i>, 2000). Monitoring will recommence once the mitigation measures are in place.</p> <p>The Firth adjacent to the application site is 1.4 km wide. Whilst noise and vibration may impact on dolphin resulting in their displacement from the Firth, the proposed measures will mitigate impacts such that it can be concluded that the proposed work will not have an adverse effect on the qualifying feature of the SAC, i.e. bottlenose dolphin.</p>
Conclusion	No adverse effect on the integrity of the SAC.
Overall conclusion	The development of the application site alone will not have an adverse effect on the integrity of this European Site and its interest features.

### Summary of Adverse Effects on European Site Integrity

6.3 The assessment of the project alone has concluded that the proposed development will not have an adverse effect on the integrity of any European sites and their interest features. A summary of the appropriate assessment conclusion is presented in Table 24. This assessment has been carried out taking into account all necessary mitigation measures.

Table 24: Summary of the appropriate assessment

European site	Is the proposed development likely to have an adverse effect on the integrity of a European site?			
	Habitat loss	Habitat damage	Disturbance	Water Quality
Firth of Tay and Eden Estuary SAC	No	No	No	No
Firth of Tay and Eden Estuary SPA	No	No	No	No
Firth of Tay and Eden Estuary Ramsar	No	No	No	No
Outer Firth of Forth and St Andrews Bay pSPA	No	No	No	No
River Tay SAC	No	No	No	No
Moray Firth SAC	No	No	No	No

### **In-combination assessment**

- 6.4 Regulation 48(1)a of the Conservation (Natural Habitats, &c.) Regulations 1994 (the 'Habitats Regulations') requires that the screening assessment considers the effects of a development alone and in combination with other plans and projects. In this section the impacts of the development are considered in combination with other plans and projects for those impact mechanisms where a conclusion of 'no adverse effect alone' has been reached. The impact mechanisms where an 'in combination' effect is possible relates to:
- marine noise resulting from piling work, which may result in the disturbance of harbour seal and bottlenose dolphin; and
  - disposal of dredged material, which may result in changes in water quality that could have an adverse effect on harbour seal, bottlenose dolphin and migratory fish.
- 6.5 Other impact mechanisms have been scoped out of the 'in combination' assessment and the rationale for this is set out below. It is acknowledged that mitigation measures are unlikely to be 100% effective and so there may be a small residual effect. Impact mechanisms have been scoped out where any residual effect is too small to be measurable or is likely to be very localised in its scope.
- Physical habitat loss – The assessment has concluded that direct impacts on habitats (habitat loss) are not likely to occur and that areas that could be impacted are not 'functionally linked' to a European site.
  - Physical habitat damage – The assessment has concluded that direct impacts on habitats (habitat damage or disturbance) are not likely to occur and that areas that could be impacted are not 'functionally linked' to a European site.
  - Disturbance – Survey has revealed that impacts on birds due to, for example, piling noise or noise from working machinery, are not likely as the adjacent marine and intertidal habitats are not 'functionally linked' to a European site.
  - Changes in water quality: Pollution related impacts arising from the application site are unlikely due to proposed control measures and permitting; pollution entering the marine environment will have a minimal localised effect due to the relatively small scale and duration of the works, and the effects of dilution and dispersal in the receiving environment.

### **In-combination assessment of piling noise**

- 6.6 A search has been carried out on the Dundee City Council planning website<sup>4</sup> for planning applications that have been submitted for works that have the potential to impact on the Firth of Tay. No active applications or consented activities that have yet to be completed have been identified.
- 6.7 A search has also been carried out of Marine Scotland<sup>5</sup> active licences and current licence applications and there are none within the Firth of Tay that have the potential to have an in-combination effect with the proposed development. The in-combination assessment has also considered other existing potential sources of marine noise. There is existing vessel traffic associated with the Port of Dundee, which is the main port in the Firth of Tay. The Port currently has an average of 746 vessel movements per annum (ERM, 2019), as well as permitted development rights to increase operations on an unrestricted basis. Consequently the assessment of noise-related impacts needs to be considered against a baseline where there are already noise sources contributing to an elevated baseline noise level.

<sup>4</sup> <http://idoxwam.dundee.gov.uk/idoxpa-web/>, accessed 23 October 2019.

<sup>5</sup> <http://marine.gov.scot/marine-projects>, accessed 23 October 2019.

### **In-combination assessment of dredging**

- 6.8 In 2017 ERM undertook a BPEO on behalf of Forth Ports to support the application for a maintenance dredge spoil disposal within the port of Dundee. Marine Scotland granted Forth Ports a Marine Licence for the disposal of up to 100,000 m<sup>3</sup> sediment in November 2017. The spoil is disposed of at Middle Bank disposal site, which was determined by the BPEO to be the best option for disposal.
- 6.9 For the proposed capital dredge at the Port of Dundee, Forth Ports proposes to use the Middle Bank spoil ground, located approximately 0.6 nautical miles from Dundee. This is the site that has been used for disposal of dredge spoil from the Port of Dundee since 1994, is not used by any other parties and is the site closest to the port, therefore minimising the travel distance for dredging vessel transport.
- 6.10 As the Middle Bank disposal site is not used by any other parties there is no mechanism by which an in-combination impact could occur.
- 6.11 In conclusion, the in-combination assessment has not identified any plans or projects that, when considered alongside the proposed development at the Port of Dundee, are likely to have a significant effect on a European site. Consequently the summary assessment presented in Table 24 remains unchanged.

### **Conclusion**

- 6.12 A previous screening assessment has concluded that the proposed development, in the absence of mitigation measures, will result in 'likely significant effects' on the qualifying features of the following European sites:
- Firth of Tay and Eden Estuary SAC (as a result of habitat loss and damage and disturbance)
  - Firth of Tay and Eden Estuary SPA (as a result of disturbance)
  - Firth of Tay and Eden Estuary Ramsar (as a result of disturbance)
  - Outer Firth of Forth and St Andrews Bay pSPA (as a result of disturbance)
  - River Tay SAC (as a result of disturbance)
  - Moray Firth SAC (as a result of disturbance)
- 6.13 As the screening assessment has been carried out in the absence of mitigation measures it is compliant with the requirements of the judgement People Over Wind and Sweetman (12 April 2018, C-323/17).
- 6.14 As the proposed development is not directly connected with or necessary to the management of either European site (Regulation 48(1)b) it has been necessary to make an appropriate assessment of the implications for each affected European site in view of that site's conservation objectives (Regulation 48(1)).
- 6.15 The appropriate assessment, which has been carried out in accordance with Regulation 48(1)a of the Conservation (Natural Habitats, &c.) Regulations 1994 (the 'Habitats Regulations'), has concluded that the proposed development is not likely to have an adverse effect on the integrity of any sites of European importance, either alone or in combination with other plans and projects.

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## **8 Figures**

Figure 1: Location map

Figure 2: Designated sites



Legend

 Site Boundary



OFFICE: Newcastle  
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JOB REF: P19-717

PROJECT TITLE  
Port of Dundee

DRAWING TITLE  
Location Plan

DATE: 14.02.2020  
DRAWN: HN

SCALE: 1:24,000  
STATUS: DRAFT

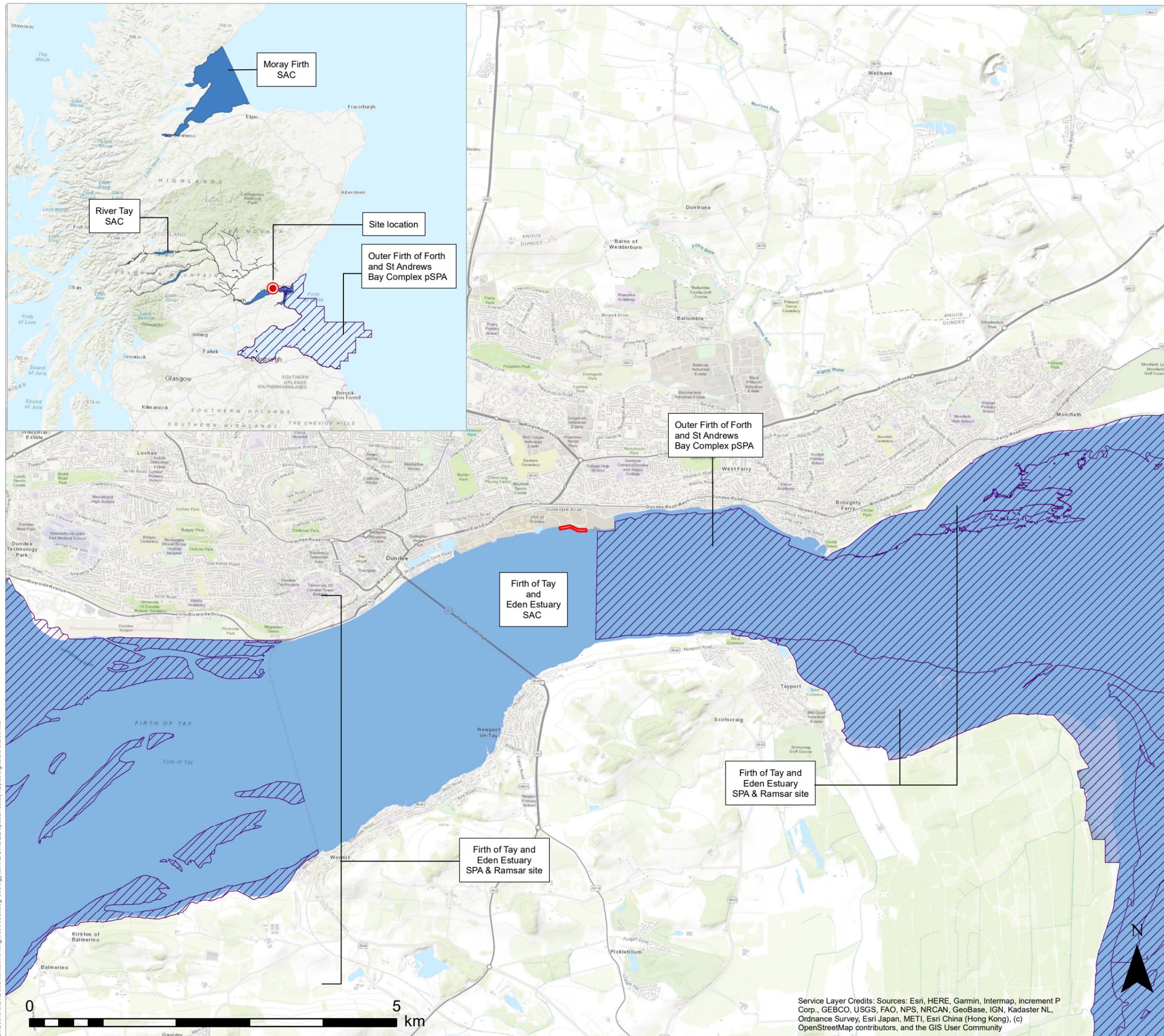
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Sources: BSG Ecology survey data



**LEGEND**

- Site boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)



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PROJECT TITLE  
 DUNDEE EAST REDEVELOPMENT HRA SCREENING

DRAWING TITLE  
 Figure 2: European sites

DATE: 12.02.2020      CHECKED: SB      SCALE: 1:50,000  
 DRAWN: COH      APPROVED: SB      VERSION: 1.3

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