ORKNEY
ISLANDS COUNCIL

Scapa Deep Water Quay

Habitats Regulations Appraisal Report

July 2026

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Revisions & Approvals

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Contents

1 Introduction

1.1 Background to the Project

The Scapa Deep Water Quay (SDWQ; 'the Project') is a major strategic port infrastructure project proposed by Orkney Islands Council Harbour Authority (OICHA, 'the Applicant') for Scapa Flow, Orkney. It is designed to provide a deep-water berth capable of accommodating floating offshore wind (FOW) assembly, integration, operations and maintenance, alongside heavy-lift capacity for large-scale turbines and foundations. The quay will also support wider marine industries and future energy transition activities. Its location offers naturally deep, sheltered water adjacent to sufficient land for laydown, with safe navigation and minimal dredging - attributes that make Scapa Flow one of the few sites in the UK capable of hosting operations at this scale. The location of the Project is shown in Figure 1-1.

A marine licence application under the Marine (Scotland) Act 2010 and a planning permission application under the Town and Country Planning (Scotland) Act 1997 were submitted in September 2023 for determination by the marine regulators, Scottish Government's Marine Directorate – Licensing Operations Team (MD-LOT) and OIC Planning Department ('the Competent Authorities'). These applications were supported by an Environmental Impact Assessment (EIA) undertaken under both the Town & Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the Terrestrial EIA Regulations') and the Marine Works (Environmental Impact Assessment (Scotland) Regulations 2017 ('the Marine EIA Regulations'). The requirement for Additional Information under the Marine and Terrestrial EIA Regulations has since been triggered four times, with this document supporting the latest Additional Information submission.

1.2 Scope

This HRA Report has been prepared in line with the requirements of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) ('the Habitats Regulations') to support the Town and Country Planning and Marine Works Licence applications for the Project. It has been updated in response to the requests for Additional Information submitted to date. This Report comprises both Likely Significant Effect (LSE) Screening and 'Information to Inform Appropriate Assessment' stages of the required appraisal.

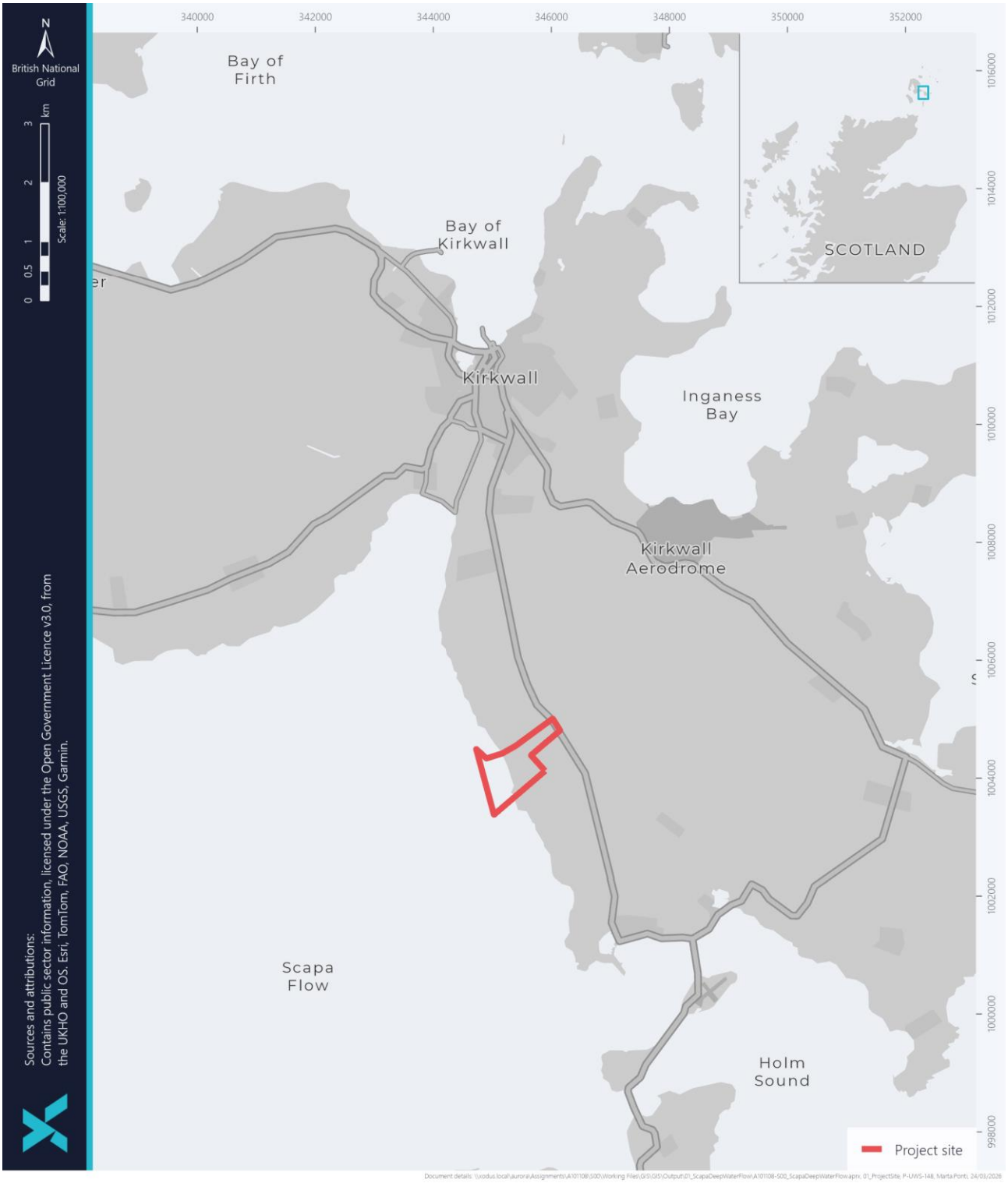

Figure 1-1 Location of Project site

1.3 Purpose of this Report

The consideration of potential impacts of plans and projects on European Sites is required under the European Union's (EU) Habitat's Directive. These requirements are transposed into United Kingdom (UK) legislation by the Habitats Regulations relevant to the Project, as described in Section 2. An HRA must be carried out for any plans and projects with the potential to have LSE on European Sites, for example through spatial connectivity or designated features with an assumed connectivity. Further information on the HRA process and requirements is detailed in Section 3 below.

This Report provides an LSE Screening exercise (see Section 6), which considers whether the Project has the potential to have an LSE on a European Site, either alone or in combination with other plans or projects. In line with the HRA process, the European Sites where LSE could not be excluded have been taken forward for further assessment within this Report and considers whether there is any potential for the Project to adversely affect the integrity of a European Site (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) including candidate and proposed sites, Sites of Community Importance (SCIs) and Ramsar Sites), either alone or in combination with other plans or projects.

Consultation has been undertaken with relevant stakeholders to inform the Screening process and guide the Information to Inform Appropriate Assessment. Further information on consultation undertaken to date is provided in Section 4.

This document aims to provide the Competent Authority (in this case is MD-LOT and OIC) with the information required to assist them in undertaking an Appropriate Assessment (AA) for the Project as required under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) ("the Habitats Regulations"). The Habitats Regulations transposed into domestic law the requirements of Article 6(3) of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna ("the Habitats Directive").

1.4 Document Structure

The structure of this document is as follows:

- Section 1: Introduction. Provides the background of the Project and the purpose of this report.
- Section 2: Legislation, Policy and Guidance. Identifies the legislation, policy and guidance driving the need for the LSE Screening and Information to Inform Appropriate Assessment, which also define the structure and content of the report, and an overview of the HRA process.
- Section 3: Methodology. Details the methodology followed through the undertaking of this HRA.
- Section 4: Stakeholder Consultation to Date. Provides details of the consultation process to date with regards to the HRA.
- Section 5: Project Description. Outlines the Project design parameters for the construction, and operation and maintenance phases of the Project.
- Section 6: LSE Screening. Provides the LSE Screening assessment in order to identify the European sites with relevant qualifying features to be considered within the determination of potential LSE.
- Section 7: Mitigation Plans. Provides a summary of mitigation and monitoring measures committed to by the Project.
- Section 8: Annex I Habitats Assessment. Provides an assessment of potential adverse effects on site integrity for SACs with Annex I habitats, including from the Project alone and in combination with other plans or projects.
- Section 9: Annex II Marine Mammals Assessment. Provides an assessment of potential adverse effects on site integrity for SACs with Annex II marine mammal qualifying features, including from the Project alone and in combination with other plans or projects.
- Section 10: Ornithology Features Assessment. Provides an assessment of potential adverse effects on site integrity for SPAs with ornithology qualifying features, including from the Project alone and in combination with other plans or projects.
- Section 11: Conclusions of the Assessment. Summarises the conclusions of the potential adverse effects of the Project on the site integrity of relevant European Sites, either alone or in combination.

1.5 Work to Date

This report builds on the previous application material submitted by the Applicant:

- EIA Report submitted in 2023 in support of the Marine License Application (EnviroCentre, 2023);
- The EIA Addendum and Additional Information submitted to MD-LOT in 2024 (EnviroCentre, 2024a);
- The May 2025 Additional Information and supporting documents (EnviroCentre, 2025a); and
- The Additional Information submitted in October 2025 (EnviroCentre, 2025b).

The Supplementary Environmental Information (SEI) Reports were submitted as part of the request for Additional Information from the Regulator, under the EIA Regulations.

1.6 Authors

This report was jointly authored by EnviroCentre Ltd and Xodus Group Ltd.

For EnviroCentre, Matt Sullivan, Principal Environmental Consultant and topic lead for marine ornithology, was the senior author, and was supported by Jennifer Paterson Principal Ecologist; and Gemma Nixon Associate Director for marine mammals.

For Xodus Group, Dr Ewan Edwards, Environmental Specialist and topic lead for marine ecology was the senior author, and was supported by Jennifer O'Neill, Senior Environmental Consultant; and Pia Ricca, Lead Environmental Consultant.

2 Legislation, Policy and Guidance

This section provides an overview of relevant legislation, planning policy and guidance.

2.1 Legislative Context

The requirement for the Project to consider the potential effects of plans and projects on European Sites falls under The Habitats Regulations, specifically The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) which is applicable to projects within the 12 Nautical Mile (NM) limit.

The Habitats Regulations require consideration of potential effects from projects and plans on European Sites, including SACs, candidate SACs (cSACs), SPAs, potential SPAs (pSPAs), SCIs and Ramsar sites (under the Conservation on Wetlands of International Importance especially as Waterfowl Habitat 'the Ramsar Convention'). An HRA must be carried out to determine the potential for a development to result in an LSE on European Sites, either individually or in combination with other plans or projects. Sites of Special Scientific Interest (SSSIs) and other marine protected areas (MPAs) are not European Sites and do not form part of the HRA process.

Following the UK's exit from the European Union, SACs and SPAs designated under the UK and the Habitats Regulations no longer form part of the EU's Natura 2000 Network. These sites and new SPAs and SACs now form the UK National Site Network. This includes both inshore and offshore sites in the UK. The policies and procedures under the Habitats Regulations remain unchanged. These amendments were made through the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 and the Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019 (the "EU Exit Regulations"). Guidance on the implications of EU Exit on the HRA regulations is available through the Scottish Government website (Scottish Government, 2020).

The procedural requirements to undertake HRAs for assessing potential effects on European Sites are contained in the Habitats Regulations. The objectives in relation to the UK National Site Network include:

- To maintain or restore habitats and species listed in the Habitats Directive to favourable conservation status; and
- To contribute to ensuring the survival and reproduction of certain species of wild bird in their area of distribution and to maintaining their populations at levels which correspond to ecological, scientific, and cultural requirements, while taking account of economic and recreational requirements.

2.2 The HRA Process

Scotland enacts a staged process for the assessment of plans or projects under the Habitats Regulations, with guidance provided by NatureScot available through their HRA website[1]. There are nine steps of the Scottish HRA process, as summarised below:

- Step 1. What is the plan or project?
- Step 2. Is the plan or project directly connected with or necessary to site management for nature conservation?
- Step 3. Is the plan or project (either alone or in combination with other plans or projects) likely to have a significant effect on a European Site?
- Step 4. Undertake an appropriate assessment of the implications for the site in view of its conservation objectives.
- Step 5. Can it be ascertained that the proposal will not adversely affect the integrity of the site?
- Step 6. Are there alternative solutions?
- Step 7. Would a priority habitat or species be adversely affected?
- Steps 8 and 9. Are there imperative reasons of overriding public interest (IROPI)?
-

European Commission's (2021) guidance outlines the staged HRA process, condensing the nine steps outlined above into three key stages. The three key stages are commonly categorised as the following:

- Stage One (i.e. Steps 1-3 above): LSE Screening - to determine whether a proposal is likely to have a significant effect on a European site; this stage does not take into account any embedded mitigation measures (provided in Section 6);
- Stage Two (i.e. Steps 4 and 5 above): AA carried out by the Competent Authority and informed by the Information to Inform Appropriate Assessment - to ascertain whether the proposal will or will not adversely affect the integrity of a European site; this stage considers the embedded mitigation measures implemented for the Project (provided in Sections 8 to 10);
- Stage Three (i.e. Steps 6-9 above):
  - Assessment of Alternative Solutions - if it cannot be ascertained that a European site's integrity will not be adversely affected, alternative solutions will need to be considered; and
  - Assessment of 'Imperative Reasons of Overriding Public Interest' (IROPI) - if there are no alternative solutions which can be implemented to ensure no adverse effects on a European site's integrity then an assessment of whether there are imperative reasons of over-riding public interest for the proposal will be undertaken.

Should there be the potential for an adverse effect on the integrity of any European Site, Stage Three will be implemented accordingly.

2.2.1 LSE Screening (Stage One)

LSE Screening aims to determine if the Project may have an LSE on a European Site, either alone or in combination with other projects. The methodology followed is provided in Section 3, and the LSE Screening exercise is provided in Section 6.

2.2.2 HRA Appropriate Assessment (AA) (Stage Two)

Where LSE Screening cannot exclude potential LSE, a European Site is progressed to an AA. The Information to Inform Appropriate Assessment is provided by the applicant for a project, to assess the potential for the Project to adversely affect the integrity of a European Site, alone or in combination with other plans and projects.

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[1] Information on the staged process for completing a HRA is available on the NatureScot maintained sites at https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra, which is correct as of March 2026.

The assessment is conducted with regard to the European Site's structure and function and its Conservation Objectives. The assessment within the Information to Inform Appropriate Assessment provides the necessary information for the Competent Authority to carry out an AA. This is required before the Competent Authority undertakes or gives any consent, permission, or other authorisation for, a plan or project.

This report includes information to enable the Competent Authority to carry out an AA (Sections 8 to 10).

2.2.3 Assessment of Alternative Solutions (Stage Three)

If the Competent Authority cannot reach a conclusion of no adverse effect on the integrity of a European Site, alternative solutions are evaluated. This may include, for example, modifications to the design or location of a project.

2.2.4 Assessment of Imperative Reasons Of Overriding Public Interest (IROPI) (Stage Three)

If no alternative solutions exist for the plan or project that can be implemented, a development may only proceed by satisfying the principles IROPI. Where the principles of IROPI are satisfied, compensatory measures must be put in place to maintain the coherence of the UK National Site Network and offset the adverse effects caused to the European Site integrity.

2.2.5 Mitigation

Following the outcome of the European Court of Justice in the People Over Wind and Sweetman case in 2018 (Case C323/17), which was further refined in rulings by the same Court in June 2023, NatureScot provided guidance on the consideration of mitigation in the HRA process, by way of an interpretation of the People over Wind judgement. Advice relating to the consideration of mitigation within the HRA process is published and maintained on the NatureScot website[2].

NatureScot guidance outlines that mitigation measures intended to avoid or reduce harmful effects to a European Site cannot be considered at the LSE Screening stage. Embedded mitigation measures which are not specifically designed to avoid or reduce effects on a European Site, but do so incidentally, can be considered.

The LSE Screening (Section 6) does not consider embedded mitigation measures that are specifically implemented to reduce or avoid effects on a European Site but does consider mitigation measures which are not specifically designed in relation to effects on European Sites, for example Shipboard Oil Pollution Emergency Plans. Mitigation measures remain applicable for the determination of adverse effects on site integrity, which is the focus of the Information to Inform Appropriate Assessment (Sections 8 to 10).

2.3 Guidance Documents

Within Scotland, the HRA process draws on guidance and advice provided by NatureScot, primarily through the HRA guidance document 'Habitats Regulations Appraisal of Plans. Guidance for Plan-making Bodies in Scotland' (NatureScot, 2023). Other guidance documents that have been used to inform the HRA process presented within this Report include:

- Article 6 - Managing and protecting Natura 2000 sites (European Commission, 2000);
- Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2021);
- Managing Natura 2000 sites – The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2018);

[2] The NatureScot guidance following the People over Wind judgement is available at https://www.nature.scot/doc/naturescot-guidance-note-handling-mitigation-habitats-regulations-appraisal-people-over-wind-cjeu, with the provided information correct as of May 2025 (NatureScot, 2025).

- European Site Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (NatureScot, 2022a);
- EU Exit: habitats regulations in Scotland (Scottish Government, 2020); and
- The handling of mitigation in Habitats Regulations Appraisal – the People Over Wind Court of Justice of the European Union (CJEU) judgement 3 (NatureScot, 2025a).

3 Methodology

3.1 LSE Screening – Overview of the Screening Process

This Section outlines the LSE Screening process, which has been followed throughout this report. The approach follows the steps detailed in Section 2.2 and has been utilised for the following receptor specific topic assessments:

- Section 6.1 - Annex I habitats;
- Section 6.2 - Annex II marine mammals; and
- Section 6.3- Ornithology features.

3.1.1 Identification of European Sites and Features with Connectivity

The initial step identifies European sites and features with connectivity to the Project. The identification of European sites is conducted with reference to the qualifying interests / features in line with the following process:

- Identifying the range of effects that the Project could potentially have on qualifying feature(s) of a site (pathways for LSE); and
- Determining connectivity to the sites (e.g., if a qualifying interest/feature of the European site may overlap with the Project or the wider Zone of Influence (ZoI)[3]).

Connectivity depends on a variety of factors including life cycle, foraging behaviour, breeding, and migratory characteristics. These qualifying features associated with a particular site and the characteristics and potential for LSE from the Project. Each individual receptor topic has defined the relevant criteria used to determine connectivity. The European sites and features are identified during this step for where there is connectivity to the Project. The distances stated in this Report have been measured from the outer boundary of the Project.

3.1.2 Determination of LSE

Where connectivity is identified between the Project and the qualifying interests of a site, further appraisal is required to determine whether no potential LSE can be concluded as a result of this connectivity. To determine potential LSE, it is necessary to:

- Determine whether that qualifying feature(s) would, due to its behavioural and foraging characteristics, be affected by a particular effect (species sensitivity); and
- Where a qualifying feature is likely to be affected by an effect, identify whether or not this is likely to have a significant effect on the conservation objectives for the site (conclusion of potential LSE or not).

The assessment of no potential LSE uses data and information on effect pathways and characteristics of qualifying interests as part of a high-level appraisal. This appraisal assesses whether or not any of the site's conservation objectives may be undermined due to the potential for LSE. Where there is no potential for the conservation objective to be undermined, no potential LSE is concluded and it is therefore proposed that this is screened out from Stage Two of the HRA Process.

3.1.3 Receptors Not Considered - Diadromous Fish

European Sites designated for diadromous fish have been screened out of this process, in line with recent industry feedback received from MD-LOT and NatureScot. This is due to the uncertainty in the distribution and behaviour of diadromous fish in marine waters which means that impacts cannot be apportioned to individual SACs. Therefore, impacts on diadromous fish are considered within the EIA Report (EnviroCentre, 2023) only.

[3] The ZoI is the area outwith the Project boundary, which may be affected by the proposed activities within the Project. Specifically, the ZoI is the spatial area in which receptors may be affected by biophysical changes as a result of the Project and associated activities (CIEEM, 2019) and is specific to different receptors and can vary depending on the nature of the receptor(s).

4 Stakeholder Consultation To Date

Table 4-1 below summarises the stakeholder consultation received to date that has informed the LSE Screening and Information to Inform Appropriate Assessment, presented in Section 6, and Sections 8 to 10, respectively.

Table 4-1 Summary of consultation that has informed the LSE Screening and Information to Inform Appropriate Assessment

Consultee / Stakeholder	Date	Summary
Scoping Opinion – Marine Directorate	October 2021	The Scottish Ministers agree with representation from NatureScot, RSPB, the OIC and advise that full consideration and assessment of the potential impact of the Proposed Works on the Scapa Flow pSPA, Hoy SPA, Orkney Mainland Moors SPA, Loch of Stenness SAC and Sanday SAC must be fully considered in the EIA Report.
		The Scottish Ministers direct the Applicant to NatureScot's comments on the potential for significant adverse effects on the Scapa Flow pSPA and the possibility of NatureScot objecting if these concerns are not addressed. The Scottish Ministers therefore direct the Applicant to engage with NatureScot to address these concerns.
NatureScot - Scoping Response (reiterated by Orkney Islands Council)	21 May 2021	European Protected Areas The proposed development is likely to have a significant effect on qualifying interests of the Scapa Flow pSPA, Hoy SPA, Orkney Mainland Moors SPA, Loch of Stenness SAC and Sanday SAC. Therefore, effects on these site's features should be assessed for all phases of the development in the EIAR, as well as HRA. The EIA must provide sufficient information for the Competent Authority to be able to undertake appropriate assessments in view of these site's conservation objectives for their qualifying interests. Details of qualifying interests and conservation objectives can be found on our website.
		Scapa Flow pSPA The proposal is located within the Scapa Flow pSPA designated for its breeding red-throated diver and nonbreeding black-throated diver, eider, goldeneye, great northern diver, long-tailed duck, red-breasted merganser, shag and Slavonian grebe. Potential impacts to features may arise from the permanent displacement of birds from the development footprint; disturbance of birds in the vicinity of the proposal during site investigation, construction and/or operational phases and the temporary or permanent loss of or damage to prey-supporting habitats in the development vicinity or at dredge spoil disposal sites. Of potentially greater importance than direct impacts is the associated increased levels of vessel traffic that are the intended consequence of the proposal. Many of the features of this site exhibit high or very high levels of behavioural sensitivity to vessel movements and the potential for impact on site integrity is highest for those species with relatively high levels of habitat specialisation and/or relatively small populations within this site. This includes black-throated diver, red-throated diver and Slavonian grebe. It remains unclear how the nature, routing and frequency/volume of vessel traffic through the Scapa Flow pSPA are anticipated to change as a consequence of this development. Therefore, it is important that the EIA and HRA also includes an assessment of these wider operational phase impacts.
		Hoy SPA The proposal has connectivity to cliff-nesting seabird interests of the Hoy SPA, including fulmar, great-black backed gull, great skua, common guillemot, kittiwake and puffin, as well as breeding red-throated diver. The proposal is well within foraging ranges of the cliff-nesting seabird features of the Hoy SPA and there is potential for disturbance to these features, although likely sensitivities are less than for wintering waterbirds. The footprint of the proposal itself is outwith the 10km foraging range for breeding red throated diver associated with the Hoy SPA. However, as detailed above increased vessel traffic associated with the proposal within wider parts of Scapa Flow could have connectivity to the Hoy SPA population and should be assessed.
		Orkney Mainland Moors SPA The proposal is within 10km of parts of the Orkney Mainland Moors SPA, and hence potentially within the foraging range of breeding red-throated divers from this site, although actual diver nesting locations within the SPA may be more distant. Associated vessel movements across wider parts of Scapa Flow could have connectivity to red-throated divers from this site and should also be assessed.
		North Orkney SPA We would not consider there to be any connectivity for assessment purposes with the North Orkney pSPA, unless there are associated vessel movements during the construction phase (e.g. to deliver equipment or materials or to remove dredge spoil). If this is the case then information on the features of this site can be found on our website.
		We note the intention of undertaking a cumulative assessment as part of the EIA, cumulative impacts will also need to be assessed as part of the HRA.
		MSS note, in agreement with the advice from NatureScot, that the proposed development is in proximity to the Sanday SAC, designed for harbour seals, and that this site is not mentioned in the scoping report. Impacts on this species should be assessed for all phases of the development as part of the EIA, and sufficient information should be provided to assess impacts to the species as a qualifying features of Sanday SAC as part of the HRA. When considering potential impacts on seals, the serious decline in harbour seal populations on the east coast of Scotland will need to be taken into account, which is reflected in the small Potential Biological Removal (PBR) limit calculated for harbour seals in the management area. This may also have implications for the HRA.
		The proposal is within Scapa Flow SPA, protected for its non-breeding and breeding marine birds. The proposal could also affect Sanday SAC protected for Harbour seal and various intertidal and subtidal habitats; Loch of Stenness SAC, protected for its coastal lagoon; and North Orkney SPA, Hoy SPA and Orkney Mainland Moors SPA, protected for a number of breeding and non-breeding birds.
NatureScot – response to October SEI **Nb these responses have been summarised for brevity.**	11 November 2025	Scapa Flow SPA – Black-throated diver We are unable to conclude no adverse effect on site integrity for the black-throated diver of Scapa Flow SPA. This is based on the potential disturbance and displacement impacts associated with the use of cranes at the proposed development site. The operation of cranes could potentially lead to the disturbance and displacement of a minimum of 19% of the SPA population of black-throated diver… We advise that it is not possible to fully mitigate the potential impacts. Despite some outstanding issues and uncertainties, we are satisfied with some of the suggested mitigation to minimise impacts associated with the construction phase of the proposal, this includes vessel movements, dredging, and airborne noise disturbance, and with the operation vessel movements. However, due to the scale and nature of impacts from operational activities on a significant proportion of the black-throated diver SPA population, we have concluded that adequate mitigation to minimise these impacts on this feature is not feasible.
		Scapa Flow SPA – Great northern diver Due to the lack of assessment for crane operations we cannot conclude no adverse effect on site integrity for this feature. The applicant's information and impact assessment on the construction phase vessel movements is incomplete. An assessment of impacts from crane operations has only been assessed for black-throated diver and whilst we agree that this is the feature that will most likely be impacted by this operation, other qualifying features which are sensitive to towering structures should have been assessed within the HRA, specifically great northern diver and red-throated diver.
		Scapa Flow SPA – Red-throated diver Due to the lack of assessment for crane operations we cannot conclude no adverse effect on site integrity for this feature at this time. An assessment of impacts from crane operations has only been assessed for black-throated diver and whilst we agree that this is the feature that will most likely be impacted by this operation, other qualifying features which are sensitive to towering structures should have been assessed within the HRA, specifically great northern diver and red-throated diver.
		North Orkney SPA Due to the lack of assessment for crane operations… we cannot conclude no adverse effect on site integrity for these features at this time.
		Orkney Mainland Moors SPA

Consultee / Stakeholder	Date	Summary
		Due to the lack of assessment for crane operations for this feature… we cannot conclude no adverse effect on site integrity.
		Sanday SAC We conclude LSE for harbour seal but consider that it has not been ascertained that the proposal will not adversely affect the integrity of the Sanday SAC… based on an incomplete in-combination assessment.
		Loch of Stenness SAC Our conclusion is that the proposal will not adversely affect the integrity of the site *provided that* the final Biosecurity Plan should be submitted for approval… prior to construction. This proposal could be progressed with appropriate mitigation. However, because it could affect internationally important natural heritage interests, we object to this proposal unless it is made subject to conditions so that the works are done strictly in accordance with the mitigation detailed in our appraisal.
		In-Combination Assessment The in-combination assessment is still insufficient and lacking in detail considering the scale of the development. The applicant's HRA was unable to conclude if there are any in-combination effects associated with the Quanterness Fish Farm. Therefore, adverse effect… cannot be ruled out.
RSPB – response to October SEI	31 January 2025	We have considered the proposal and are concerned that it will result in a loss of approximately 19 hectares (ha) of the Scapa Flow SPA. This results in a loss of habitat, from a combination of harbour pier construction and immediate disturbance to the qualifying species of the SPA set out above.
		At this stage we consider the quality of the information and assessments in both the EIA and HRA to be insufficient to be able to conclude that there would be no adverse effect on site integrity for the qualifying features of Scapa Flow SPA and North Orkney SPA (used by the same species), namely Red-throated diver, Slavonian grebe, Great-northern diver of Scapa Flow SPA. From the information available, the proposed scheme would result in effects on SPA species as result of direct habitat loss and from construction disturbance.
Marine Directorate – request for further information	15 January 2026	Further information is required on the use of cranes, in line with NatureScot advice, including the in-combination assessment and impact assessment for crane use, the impacts of crane use on the black-throated diver, great northern diver and red-throated diver qualifying features of the SPAs.
		Further Information is required, in line with NatureScot advice, on the vessel movements during construction impacting Scapa Flow SPA. This includes, but is not limited to, information on vessels required for scour protection and caisson filling activities during the nonbreeding season of the black-throated diver.
		Further information is required, in line with NatureScot advice, on the plume dispersal modelling to ensure the Conservation Objective, 2c is not undermined for all SPA features.
		Further information is required on the in-combination assessment and cumulative impacts, in line with NatureScot advice, with consideration of the cumulative impacts of both construction and operational vessel movements.
		Further information is required on the in-combination effects for the harbour seal qualifying interest of the Sanday SAC, in line with NatureScot advice
NatureScot revised HRA	March to June 2026	Various meetings and written consultations during the preparation of the Additional Information submission, including letter dated 30th June 2026 providing comments on the draft revised HRA and confirming: 1) they agree with the Applicants conclusion of no AEoSI for North Orkney SPA, Orkney Mainland Moors SPA and Hoy SPA 2) however, with regards to the Scapa Flow SPA, and contrary to the Applicants assessment, they advise '*the development and associated operations will undermine Conservation Objective 2b [The distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance of the species] and therefore lead to adverse effect on site integrity for black-throated diver*.'

5 Project Description

5.1 Site Location

The Project is located adjacent to the Bay of Deepdale, approximately 8 km south of Kirkwall. It is located on the eastern coastline within Scapa Flow, approximately 4 km south of the existing Scapa Pier. A Location Plan is provided in Figure 1-1.

5.2 Main Purpose and Associated Activities

The Project shall provide deep-water berthing facilities for a wide range of industrial activities with the main purpose upon completion, and in the medium to long term, being the storage of components, and assembly of wind turbines serving the floating offshore wind industry. The Project shall be complete with additional emergency berthing facilities for small vessels. The Project is also identified as a potential site for the storage and supply of future fuels for the marine industry.

The Project is a permanent addition to the Orcadian infrastructure, and therefore decommissioning is not a planned phase of the Project and has not been considered within the assessment presented in this report.

5.3 Construction

5.3.1 Programme

Table 5-1 below outlines the key construction stages, their indicative durations and projected periods for works to be carried out therein.

Table 5-1 Outline Construction Programme

Works Description	Est. Duration	Est. Works period
Access road construction, haul road, earthworks and A961 re-alignment	60 weeks	December 2027 – February 2029
Caisson fabrication (off-site)	24 weeks	December 2027 – June 2028
Caisson transport (off-site fabrication to Orkney)	8 weeks	June 2028 – August 2028
Dredging bund construction	32 weeks	December 2027 – July 2028
Dredging	12 weeks	June 2028 – August 2028
Caisson installation (placement only)*	8 weeks	August 2028 – September 2028
Landside earthworks – Overburden removal, rock blasting and excavation	100 weeks	October 2027 – September 2029
Quay finishings	52 weeks	January 2029 – January 2030
Demobilisation	12 weeks	January 2030 – February 2030
Completion	N/A	February 2030

*Completion of the quay wall, including infilling of caisson cells and backfill to the rear of the units shall continue on to February 2029. This may or may not involve the vessel movements detailed in table 5-3 depending on availability of suitable material on island. The vessel movements shown in table 5-3 which refer to caisson infilling are worst case.

Blasting is anticipated to be completed within the first 59 weeks of the landside earthworks programme. However, ground conditions may dictate a change in the blasting pattern, which may extend the blasting programme to up to 100 weeks. No more than two blasts would be carried out in any one week.

5.3.2 Outline Design Criteria

The below criteria will ensure the design provides a robust, long-lasting marine structure, ensuring safety, stability, and durability under challenging environmental conditions.

- **Dredging Requirements**: The operational depths of -15.0m Chart Datum (CD) and -20.0m CD
- **Environmental conditions**: Consideration of climate change and sea-level rise scenarios (A projected sea level rise of 0.9 m by 2100 is considered, based on national climate projections), with tidal lag (normal conditions) and wave conditions (1 in 50-year, 1 in 200-year, 1 in 570-year return periods) integrated into the design.
- **Materials**: Concrete and reinforcement materials must comply with Eurocodes and British Standards, with specifications for exposure classes, cement types, and aggregate properties.
- **Caisson design**: The caissons are designed with a focus on durability, using concrete that is resistant to degradation in marine environments. Concrete properties, cement types, and aggregate characteristics have been carefully specified to ensure a long lifespan.
- **Caisson foundations and fill**: Crushed imported rock is used as the foundation layer, with strict controls on durability and strength. Fill materials inside and behind caissons are selected for high density and internal friction to ensure stability.
- **Scour protection**: Concrete scour protection mattresses and rock armour is installed to mitigate seabed erosion caused by vessel thrusters and propellers near the quay wall.

5.3.3 Site establishment and access

The access road design comprises of an 8 m wide asphalt surfaced roadway, 1.8 m wide hard verge (service strip) and 1.8 m wide remote path (south side), 1.5 m soft verge (north side) and surface water conveyance swales (both sides).

Access will be formed from A961 which is to be realigned as part of the works. This road realignment has its own planning permission and is not part of this application Safe access and egress from the A961 will be achieved with reflective signage and 2-way lights as necessary.

The access road is prioritised as a critical path activity as its completion triggers the commencement of the laydown area, landside cut and fill operations and shall provide access for the construction of the dredge containment bund, allowing dredge operations to commence. The contractor will require temporary service connections to the landside site area early in the programme to facilitate blasting, quarrying and earthworks operations.

The contractor will carry out the topsoil strip, overburden removal and elements of rock cut for the new access road. The contractor will place the subbase and surcharge it to act as a robust haul road during the construction programme. This will take cognisance of Scottish Environment Protection Agency (SEPA) comments on the need to protect Groundwater Dependent Terrestrial Ecosystems at the Project site.

The contractor will install the service trenching, drainage and ducting as the works progress to ensure water is managed effectively, services can be connected, and a safe road is completed prior to temporary traffic using it. Upon completion of the project, the contractor will trim the surcharge and carry out the final surfacing.

5.3.4 Dredging

Prior to the commencement of dredging operations, a containment bund will be constructed around the proposed reclamation area using site won general fill material screened of fines and suitable for placement below water, sourced from the initial landside excavation works and transported from the on-site designated processing areas. The bund shall be constructed up to a level of +4.0m CD using general fill below-water material, placed from the land. The bund shall be located approximately 40m behind the position of the caissons (within the footprint of the development). Integrated into this bund, a weir box system shall be installed in the northwest corner of the reclamation area. The weir box is an adjustable weir used to dewater the reclamation area, control the water level and the discharge of water/fines at a designated discharge point. All suitable dredged material will be placed in a reclamation area behind the pre-constructed bund, with any unsuitable material disposed at the licenced sea disposal site. The volumes of material to be dredged are presented in Table 5-2.

The dredging works extend along the entire quay alignment, including the main quay as well as the small vessel berths to the northern end, and are essential for preparing the seabed for subsequent caisson installation. The structures will be founded on hard bearing strata, requiring the removal of superficial soils and hard strata from approx. -15m CD down to a maximum depth of -20.5m CD. The dredged area edge slopes depend on the

material type, ranging from 1:3 in superficial soils to 1:1 in engineering rock, whilst the dredging berth pockets are required to be operative for elevations of -15m CD and -20m CD.

Dredging works will be executed in a single campaign using a cutter suction dredger (CSD) specifically selected for its capacity to operate efficiently under the anticipated soil, sea and weather conditions at Scapa Flow.

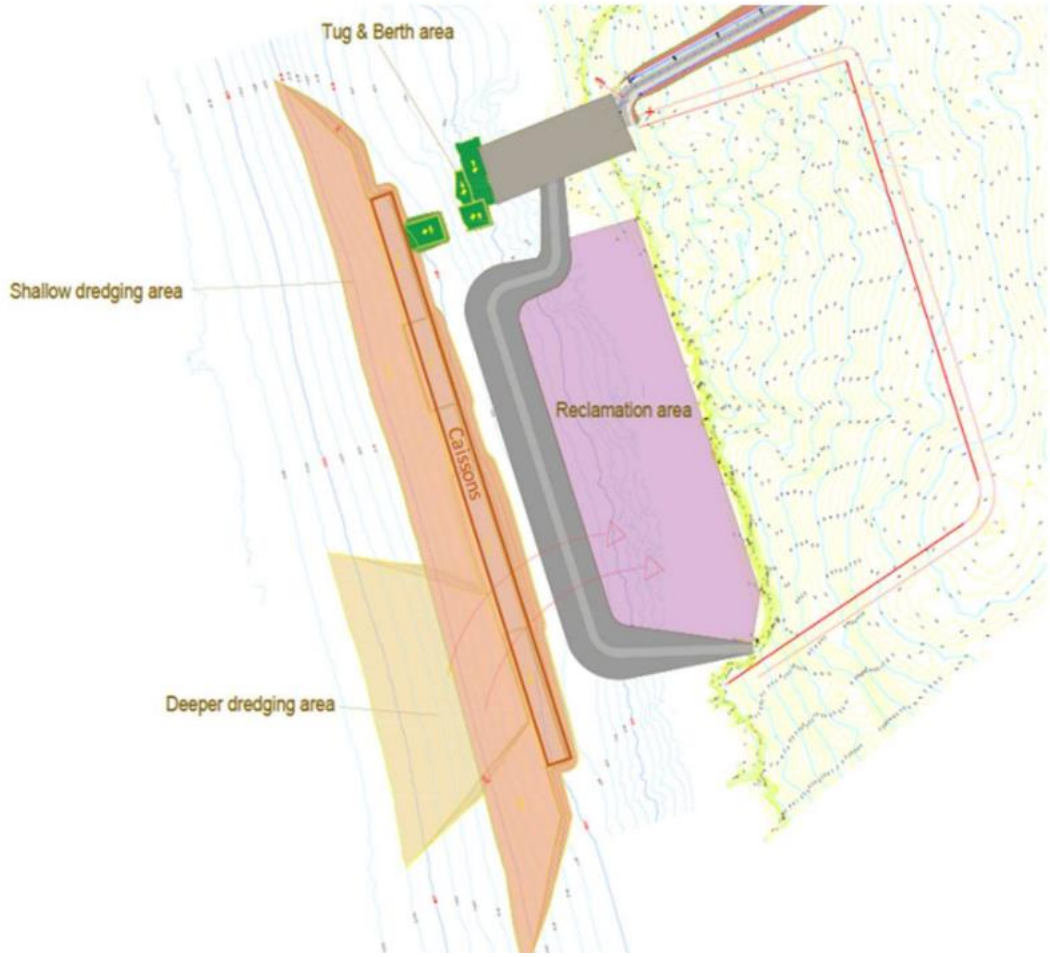


Figure 5-1 Dredging and reclamation areas

The discharging process to the reclamation area shall be carried out through the integration of the dredger pumps with the designated discharge pipeline system where the dredged material will be transported into the reclamation area. This operation will be carried out in parallel with the dredging activities, beginning at the northwest portion of the reclamation.

Turbidity meters will be installed to detect any increase in turbidity outside the reclamation area, the details of which will be included within the supporting Construction Environmental Management Document (CEMD) (see Table 7-1 for further details).

Through the early contractor involvement design stage, it has been identified that a significant reduction in material disposed at sea could be achieved from that which was originally defined in the exemplar design. There is, however, potential for up to 82,000m^3 of glacial till which may be unsuitable for re-use, to be disposed at sea (see Table 5-2).

A 4,000m^3 capacity barge(s) will be used to transport material to the licensed offshore deposit site **FI040**. If the maximum volume (82,000m^3) is deposited, there will be 21 round trips to the sea deposit site (42 vessel movements) over 12 a week period, typically this activity will be carried out between the beginning of June to the end of August (currently 2027).

Table 5-2 Proposed dredge volumes

Description	Total volume dredged (m^3)	Volume reused on site (m^3)	Volume disposed offshore (m^3)
Hard Dredge	72,653	72,653	0
Soft Dredge	306,754	306,754	0
Total	**379,407**	**379,407**	**0**
Disposal Contingency	*379,407*	*297,407*	*82,000*

5.3.5 Quay wall construction

The quay wall will be formed from reinforced concrete caissons installed on a rock bed foundation, as shown on Figure 5-2. The main quay is composed of nine large reinforced concrete caissons, with a smaller caisson at the south end that ties into the south revetment. At the north end, the small vessel berths are formed by four caissons.

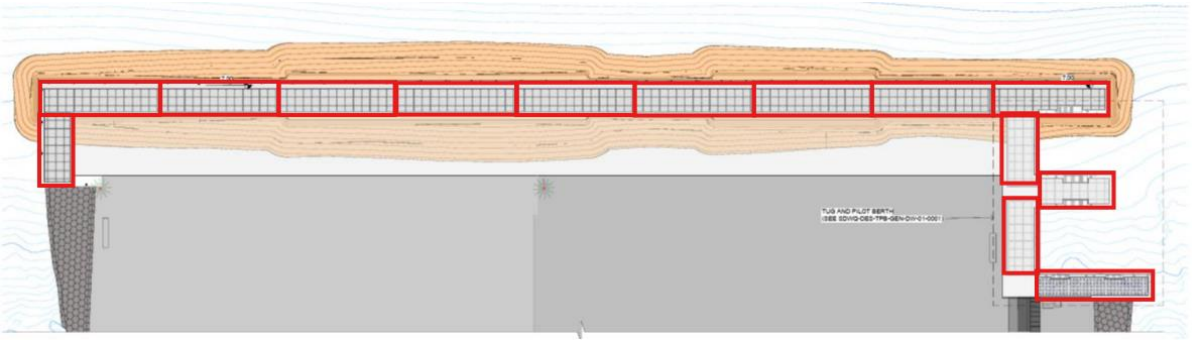


Figure 5-2 Quay Wall General Arrangement

5.3.5.1 Cassion design criteria

The main quay structure comprises nine large reinforced concrete caissons, complemented by a smaller caisson at the southern return that ties into the adjacent rock armour revetment. A range of caisson cross-sections is incorporated along the quay alignment to accommodate variations in finished dredge depths and underlying geotechnical conditions. The quay cope level is fixed at +7.00 m CD, with dredging in front of the quay generally extending to –15.0 m CD, including a 1 m over-dredge allowance. Near the southern end, a 140 m section includes a deeper dredge pocket reaching –20.5 m CD, also with a 1 m over-dredge allowance. At the northern end, the small vessel berths are formed using a series of smaller caissons. Dredging design accounts for slope requirements based on soil type to ensure foundation levels are established on engineering rock, and the geotechnical performance of the caissons is assessed for sliding, overturning, bearing capacity, and overall stability. Figure 5-3 below outlines a typical cross section for the caisson wall structure.

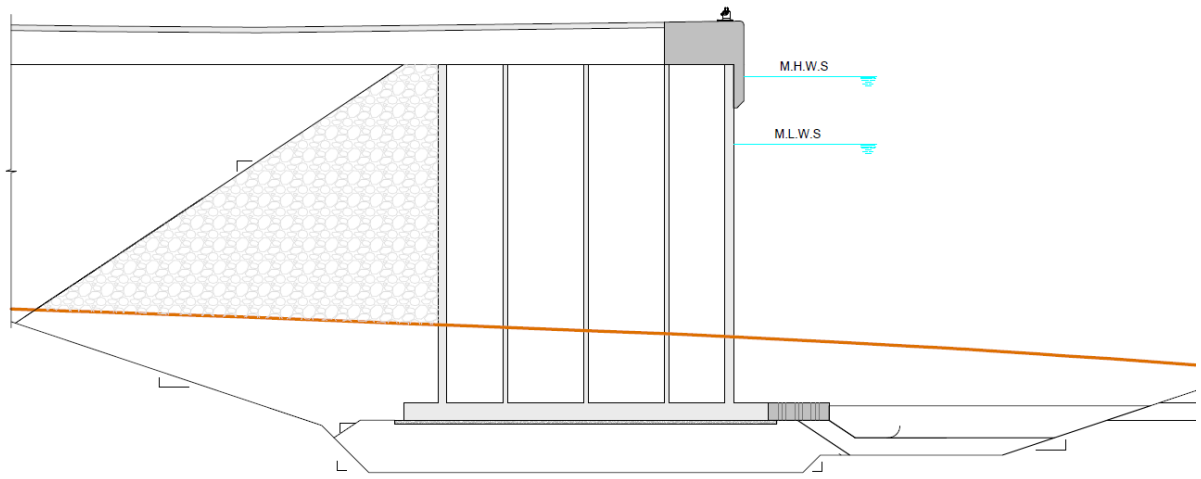


Figure 5-3 Simple cross section of caisson quay wall structure

Each caisson will be ballasted as per design, ensuring naval stability in all phases of transport and installation.

The fourteen caissons will be transported to the site in four shipments. The first batch of caissons will be directly installed in their final positions along the quay line from the semisubmersible delivery vessel. The remaining caissons of a batch in subsequent deliveries will be towed to a temporary wet storage area within the Project boundary until its final installation on the quay line.

Caissons will be dry stored during transport from Spain, reducing the risk of transporting non-native species. A Biosecurity Plan will be produced as part of the CEMD (see Table 7-1), which will set out the measures to prevent the introduction of invasive non-native species, in accordance with relevant legislation and best practice.

Figure 5-4 Image of caisson loading operation

5.3.5.2 Caisson unloading at Scapa Flow

The unloading operation at Scapa Flow requires water depths over 27 m due to the draft of the vessel and caissons, and favourable metocean conditions. The caisson deliveries will be unloaded using 3 tugboats of at least 4,000 Horsepower (3,000kW) which will be hired locally, with the operation carried out in one to two good weather days per shipment.

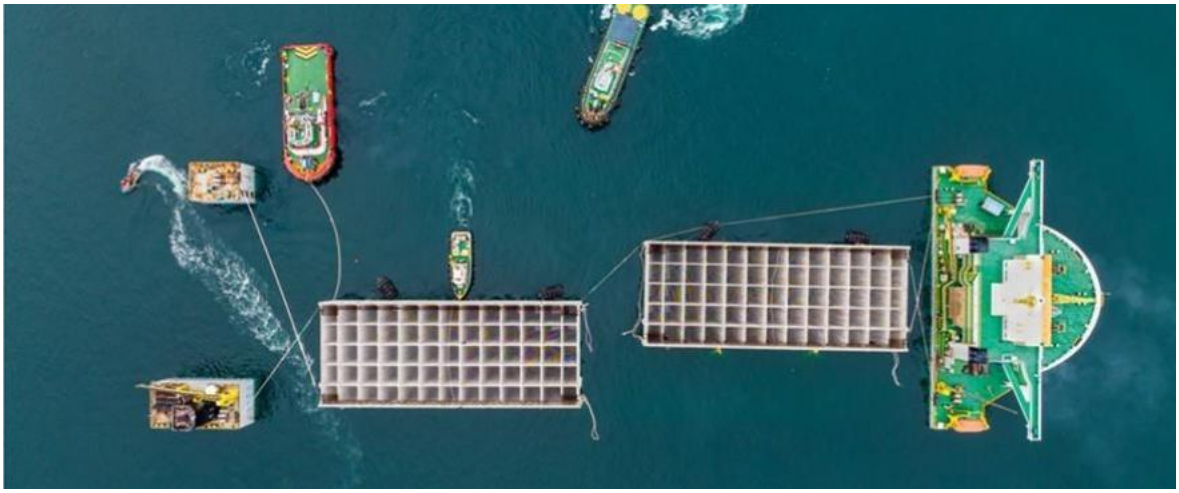


Figure 5-5 Caisson loading onto Semi-submersible vessel

Caissons will be unloaded from the semisubmersible vessel either directly to the quay line or to a nearby storage area, where they will remain until placement. The caissons will be fitted with auxiliary equipment including winches, mooring ropes and anchors, walking platforms, ballast systems, topographic prisms and fenders. After unloading, they will be temporarily secured either by tying them together alongside the partially constructed quay or by anchoring them to the seabed close to the project site. No piling or drilling is required for this operation and underwater noise will be negligible. When weather conditions permit, the caissons will be sunk into their final positions. Alternatively, they may be temporarily set down on the quay-line foundation and later refloated for final installation within tolerance.

5.3.5.3 Caisson installation

The process to install a caisson is typically performed during daylight hours in around 6-8 hours, given suitable metocean conditions which would typically be as follows: mean wave height (Hm) of 0<0.5m, peak wave period of (Tp)<7s and a wind velocity at 10 meters above sea surface (U10) < 15m/s. Caissons will be towed individually from the semisubmersible vessel or their temporary storage location to the quay line. Typically, one to three tugboats will be sufficient for towing from temporary storage, with the same tugs used to assist the installation operation.

Each caisson will be positioned while sinking, using tugs and winches, until a final controlled touchdown on the prepared foundation. Each caisson has independent and watertight groups of cells. During the operation, each group of cells is filled simultaneously with seawater either using a pump or a valve, with surveyors monitoring the level in each group to ensure that the installation process is performed in a controlled manner.

Ballasting water will be taken from the sea at Scapa Flow after caisson placement. If placement meets tolerance, ballasting continues until filled; otherwise, de-ballasting and repositioning are repeated until successful, usually in one attempt.

Figure 5-6 Caisson control platform and positioning equipment

5.3.5.4 Landside excavation platform

Mechanical methods will be used to excavate soft soils on land, while rock removal will involve drilling and terrestrial blasting, with no marine blasting planned. The overall landside earthworks programme is scheduled to be ongoing for approximately 100 weeks (Oct 27' to Sept 29' provisionally) with blasting taking place intermittently throughout this period. Due to the nature of the works, the exact timing of the blasts cannot be confirmed and should not be constrained to specific seasons of the year. It is estimated that during the 100 weeks of earthworks, a total of 35 blasts shall be carried out with no more than 2 blasts per week. Initially, the contractor will set up pre-earthworks drainage to manage surface water runoff. After establishing perimeter cut-off V ditches and before starting main land excavation and blasting, a 6m high bund will be built at least 5m from the cliff edge to ensure safety and reduce noise impact on marine life. The bund height shall be achieved by reducing the landside level by 3m and constructing a 3m high bund at the top of the excavation to achieve the overall height of 6m as shown in Figure 5-7.

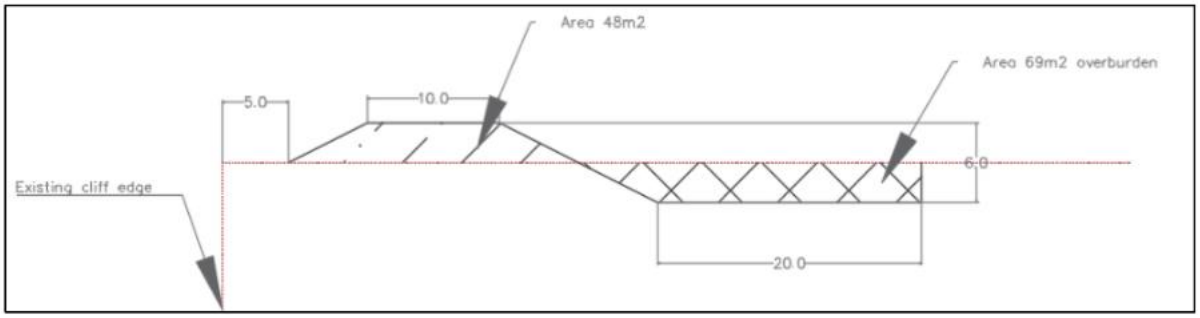


Figure 5-7 Noise bund section

The bund's crest will be 10 m wide to allow equipment movement along its length. It must be in place before any blasting begins near the cliff edge, serving as both a noise barrier and a retention wall for sediment runoff. This natural bund will be removed once the rest of the site is excavated to reach the final profile.

Blasting will be executed in 70 m strips, moving from the front (west) to the back (east) of the site. The initial bund will be constructed from overburden material taken from the first 20 m of the blasting zone. Each strip will be divided into sections sized for up to two weekly blasts, with operations taking place simultaneously at both ends of each strip. Processing areas will be located at both ends of the project site to minimize haul distances for blasted materials, and this dual-end approach will also improve fill distribution, allowing fill operations to be supplied from both directions at once.

5.3.6 Reclaimed land (sea filling)

During the dredging campaign, the dredge bund and reclaimed area which it contains shall be completed forming the initial section of land reclamation. Once caissons are installed, filled and backfilled, rock armour revetments shall be constructed at the north and south ends of the quay wall, closing the perimeter. Rock-armoured revetments protect the north and south sides of the site from wave action. These are designed for a 60-year lifespan and to withstand extreme wave conditions (1:200 years). Armour layers consist of 2.5 tonnes (north) and 4.5 tonnes (south) rocks with appropriately sized underlayers and geotextiles. At this stage, general infilling from land will commence using excavated suitable material from the landside development.

The majority of land reclamation material is comprised of dredged material and land-based excavated material (which will be screened on site to remove fines before placement). There is a requirement for imported quarry material to be used at the rear of the concrete caissons to achieve the correct grading and compaction requirements as per the caisson stability design.

Substantial marine area containment will be achieved before land reclamation fill is progressed by construction of the containment bund mentioned above, thus minimising sediment discharge outside the works.

5.3.7 Pollution control

There is the risk of pollution events (oil spills, etc.) during the construction phase of the Project. Adherence to strict Pollution Prevention controls during land reclamation works will mitigate against pollution spills.

In terms of surface water pollution, drainage will be designed, in accordance with best practice and SEPA requirements, to ensure that there are no untreated surface water discharges directly to the surrounding coastal waters. Suitable prevention measures will be in place at all times to prevent the release of pollutants to the water environment, including adjacent coastal waters.

An Outline CEMD has been produced specifically tailored to this project (see Table 7-1). This document will be further developed and enhanced to fully reflect the potential effects and suitable forms of mitigation specific to the chosen contractor's construction methods and the conditions of all consents.

5.3.8 Vessel movements

The construction phase will see the following vessel movements as outlined in Table 5-3 below. In total during the entire construction phase (26 months), there will be 112 vessel movements taking place over an eight-month period between June 2028 and February 2029, inclusive.

Table 5-3 Construction phase vessel movements

Vessel	Predicted Number of Vessel Movements	Timescales (provisional)
Caisson delivery, offloading and installation	20 movements (4 deliveries) using a semi-submersible vessel (3 tugs for offloading, 1 tug for installation) Tugs deployed from nearby Scapa Pier	July 2028 – September 2028
Scour protection	10 trips (20 movements)	August 2028 – September 2028
Caisson infilling	15 trips (30 movements)	August 2028 – February 2029
Dredging	21 trips (42 movements)	June 2028– August 2028
Total	**112**	

Based on baseline vessel movements (as informed by the Navigational Risk Assessment (NRA);see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 21.5 vessel movements per month on average (+0.16% from baseline) during winter months (October-March) and an additional 90.4 vessel movements per month on average (+0.5% from baseline) during summer months (April-September).

5.4 Operation

The Project is likely to operate as a marine facility 24 hours per day and 7 days per week, so there is the potential for activity at any time of the day or night. This will include:

- Flatbed lorries: delivering and uplifting from site.
- HGVs: delivering and uplifting from site.
- Light vans: delivering cargo or providing maintenance and servicing to site.
- Road Tankers: delivering bulk goods and liquids to site or removing liquids and waste from site; and
- Forklift trucks: loading and unloading vehicles servicing the site. In addition to the general cargo operations, there will be:
- Minibuses / cars collecting and returning people working one site - these vehicles not allowed in the working area.
- Security staff based within the site and undertaking patrols when appropriate.
- Staff looking after the facility maintenance and assisting with vessel moorings.
- Third Party Stevedore Companies loading and unloading vessels; and
- Coaches and taxis facilitating crew changes on vessels.

The internal roadways and footpaths will be demarcated with designated routes, and barriers will be installed where necessary. There will be a security fence around the working area perimeter to protect it as well as the public, in addition to preventing access to breakwaters, rock armour revetments etc. (access gates will be provided for maintenance). The fence will be constructed in accordance with the requirements of the International Ship and Port Facility Security Code (ISPS).

Table 5-4 provides a summary of the indicative infrastructure likely to be present upon completion of the Project.

Table 5-4 Indicative Operational Infrastructure

Infrastructure Type	Qty	Description
Future Marine Fuels	TBC	Possible storage and supply to vessels of very low or zero carbon fuels. Note this will be subject to further assessments and approval.
Water Tanks	4	As indicated on Figure 5-8 outside of the main working area.
Sub-station	1	Main electric supply point to site as indicated on Figure 5-8 not in main working area.
Main gatehouse / Access building	1	As indicated on Figure 5-8– outside of main working area, may contain admin offices and is the security control for site
Car park, cycle storage and bus stop	-	Vehicle parking spaces and bicycle racks. Bus stop for use by internal bus services (drop off and pick up only)

5.4.1 Quayside Services

The indicative locations of quayside infrastructure services are shown on Figure 5-8.

Quayside services such as potable water and shore power will be incorporated into a service trench that will run around the Project with bunker points to the quayside at regular intervals.

Four water storage tanks with built-in treatment systems (as required) will be installed as indicated in Figure 5-8 to supply potable water to the whole site and vessels. Located near to the water tanks will be a 33kV /11kV/415V substation for whole site supply, including shore power for vessels. Service vehicles will be accessing the Project for crew and maintenance support to these vessels.

Figure 5-8 Proposed SDQW Operational Layout

5.4.2 Vessel Movements

The Project is designed to be flexible so that many types of vessels can berth, subject to draught and length. While the quay is a major strategic facility, its operational profile is characterised by the infrequent arrival of large vessels, likely to be aligned with the integration and deployment schedules of major offshore wind developments. Approximately 80% of vessel activity will take place in the summer months.

There is significant existing vessel activity in the wider area around the proposed Project. There will be increased vessel activity introduced by the Project in the area from the existing shipping route to the site, as detailed by the orange hatched area in Appendix C, Figure 1 (EnviroCentre, 2025a); however, there are currently frequent vessel movements in this area, as shown by the vessel tracks in Appendix C EnviroCentre, 2025a, and in more detail in the NRA submitted with the EIAR (Appendix 2.3 of EnviroCentre, 2025a).

Table 5-5 outlines the annual and seasonal operational vessel activity expected for the Project.

Table 5-5 Annual and seasonal operational vessel activity

	Per year		Per winter season (October – March)		Per summer season (April – September)	
	Vessel number	Vessel movements (return trips)	Vessel number	Vessel movements (return trips)	Vessel number	Vessel movements (return trips)
Large vessels	28	56	6	12	22	44
Smaller vessels	12	24	2	4	10	20
Pilot boats for large vessels	56	112	11	22	45	90
Total	**96**	**192**	**19**	**38**	**77**	**154**

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 6 vessel movements per month on average (+0.3% from baseline) during winter months (October-March) and an additional 26 vessel movements per month on average (+1.0% from baseline) during summer months (April-September).

5.4.3 Wet storage

There is no planned wet storage of fully constructed turbines at the Project site. Any future proposals for wet storage will be conducted in accordance with the relevant regulations/consents.

5.4.4 Quayside cranes

No fixed or permanent cranage will be installed at the Project site. Instead, lifting operations will be carried out by a combination of cranes fitted to heavy lift vessels and temporary mobile cranes deployed from the quayside. Heavy lifting activities will typically coincide with large vessel movements, so cranes will be operating to similar timeframes as vessel movements.

Crane activity will be dependent on weather conditions, particularly in the winter months, as lifting of large loads is highly susceptible to even light to moderate winds. Based on analysis of 1 in 10-year weather averages in Kirkwall (1979-2010), the time lost to wind in the winter months is >200 hours per month. As such, less than 20% of lifting operations will likely take place in the winter.

There will be approximately 30 operational vessel trips per year (60 vessel movements) that involve a requirement for craneage, with approximately 24 occurring in the summer months and 6 in winter). This equates to 4 vessel trips per month (1 a week) in summer and 1 vessel trip per month (0.25 a week) in winter. As each vessel will be berthed at the Project for approximately 2-5 days, in the summer months cranes are likely to be active between 8 – 20 days per month, and in winter 2 – 5 days per month.

The mobile cranes will typically be up to 250 tonnes capacity (Liebherr LTM1250 or similar). This type of crane has an extendable telescopic boom with a maximum height of 60m in vertical lift. Smaller mobile cranes of 60 and 90 tonnes capacity will be used to support the larger cranes and will find more use during the winter months due to lower boom heights and lower windage. The maximum boom height for Leibherr LTM10-60 is 48m. On-

board vessel cranes would be in the region of 70-125m height. The maximum number of cranes in use on site will depend on activities undertaken, but in the summer months, including on-board vessel cranes, could be up to 4 cranes on site, i.e. one on-vessel crane plus 3 mobile cranes. In winter, this number will be far less and is expected to be 2 (smaller) mobile cranes, given that large shipments requiring on-vessel cranes will be planned for summer months. Mobile cranes are slow-moving and generate limited engine noise at ground level.

During the summer months, mobile cranes will typically be stored on site at the Project, and in winter, either stored on site or taken offsite if they are required elsewhere. When not in use, mobile cranes will be lowered with booms retracted and placed horizontally. In this configuration, they are approximately 5m in height. These types of cranes do not normally provide their own lighting, and lifting operations in winter will typically be carried out in daylight hours.

6 LSE Screening

The section provides the LSE Screening assessment in order to identify the European sites with relevant qualifying features to be considered within the determination of potential LSE.

6.1 European Sites Designated for Annex I Habitats

6.1.1 Initial Screening Criteria

The initial screening criteria utilised to establish European sites with relevant Annex I habitats are:

- Sites which have direct overlap with the Project; and
- Sites located within 15 km of the Project.

6.1.2 Identification of European sites and Features with Connectivity

Based on the screening criteria above, there is one European sites with Annex I habitats that have connectivity to the Project: Loch of Stenness SAC. The site details are provided in Table 6-1 below and the site's location is shown on Figure 6-1.

Table 6-1 Summary of European sites designated for Annex I habitats with potential connectivity to the Project

Site name	Qualifying interest / features	Distance to the Project (km)
Loch of Stenness SAC	Annex I Coastal lagoons	15 km northwest

6.1.3 Potential Pathways for LSE

The following potential pathways for LSE that have been considered for the screening assessment are:

- Construction activities:
  - Temporary habitat loss and/or disturbance;
  - Increased suspended sediment concentration (SSC) and associate deposition (including mobilisation of potential contaminants within the sediment);
  - Increased risk of introduction of Invasive Non-Native Species (INNS); and
  - Accidental release of pollutants.
- Operation and maintenance activities:
  - Long-term habitat loss and/or disturbance;
  - Increased SSC and associated deposition;
  - Colonisation of hard structures;
  - Accidental release of pollutants; and
  - Introduction and spread of INNS.

6.2 European Sites Designated for Marine Mammals

6.2.1 Initial Screening Criteria

There are five marine mammal species listed in Annex II of the Habitats Directive, which have been considered in the LSE Screening assessment. These are:

- Grey seal (Halichoerus grypus);

- Harbour seal (*Phoca vitulina*);
- Harbour porpoise (*Phocoena phocoena*);
- Bottlenose dolphin (*Tursiops truncatus*); and
- Eurasian otter (*Lutra lutra*).
-

The initial screening criteria utilised to establish European sites with relevant Annex II marine mammal species (SACs) are:

- The European sites with marine mammal qualifying features which overlap the Project; and
- European sites with marine mammal qualifying features within a ZoI around the Project. For each marine mammal species, the ZoI is justified in the sections below.

6.2.2 Identification of European sites and Features with Connectivity

6.2.2.1 Pinnipeds

Table 6-2 outlines the foraging ranges for the Annex II pinniped species, which will be used to determine the potential connectivity to European sites.

Table 6-2 ZoI used to identify pinniped SACs with potential connectivity to the Project.

Species	Justification	Search area
Grey Seal	Grey seals can forage great distances (more than 100 km) from their haul-out sites. However, foraging tends to be concentrated closer to haul-out sites, especially during breeding season (Carter *et al*., 2020). NatureScot general advice is that protected areas for grey seals within 20 km should be considered for connectivity.	20 km (at sea distance)
Harbour Seal	Harbour seals usually forage around 30 – 50 km from the coastline, with high concentrations near haul-out sites (Bailey *et al.,* 2014). SACs for harbour seal are to protect the breeding population, and harbour seals can travel up to 50 km from their colonies during the breeding period. NatureScot general advice is that protected areas for harbour seals within 50 km should be considered for connectivity.	50 km (at sea distance)

No European sites designated for the protection of grey seals as a primary conservation feature overlap or are within 20 km of the Project. As such, it is considered there is no potential for connectivity to any European site designated for grey seal, and therefore, these sites have been screened out for further assessment.

Harbour seals are a designated feature of the Sanday SAC which is located 36 km northeast from the Project (see Figure 6-1) with an at-sea-distance of ~85 km.

Although the standard screening distance for potential effects on harbour seals is typically 50 km – a threshold that would ordinarily result in the Sanday SAC being screened out based on the at-sea distance of 85 km, recent evidence of the significant and ongoing decline in the Orkney harbour seal population, alongside increasing understanding of wider-ranging foraging behaviour, supports a more precautionary approach. These factors indicate that seals associated with the Sanday SAC may utilise areas well beyond traditional screening buffers, increasing the likelihood of potential interaction with project activities. NatureScot has requested the inclusion of the Sanday SAC within the Project's HRA process since the Project Scoping stage in 2021 (Table 4-1) on the basis that any harbour seals present within Scapa Flow may be functionally linked to the SAC and should therefore be assessed. Ongoing consultation has reinforced the expectation for a more quantitative evaluation of Project impacts on the Sanday SAC harbour seals. For these reasons, the harbour seal qualifying features of the Sanday SAC remain within the LSE Screening.

6.2.2.2 Cetaceans

The overlapping cetacean Management Units (MU) are used to delineate an area of search for European sites with potential connectivity with the Project. The relevant MU for Annex II cetaceans are:

- Harbour porpoise: North Sea MU; and
- Bottlenose dolphin: Coastal East Scotland MU.

There are 52 SACs for harbour porpoise that lie within/overlap the North Sea MU. The closest of these SACs to the Project is the Inner Hebrides and the Minches SAC, which lies approx. 200 km from the Project.

There is one SAC for bottlenose dolphin which lies within/overlaps the Coastal East Scotland and/or Greater North Sea MUs. This is the Moray Firth SAC, which lies in the inner Moray Firth, in Scottish waters, and is designated to protect key habitat for the resident east of Scotland population of around 226 individual bottlenose dolphins (Cheney *et al*,. 2024).

Table 6-3 outlines the ZoI for the Annex II cetacean species, which will be used to determine potential connectivity to European sites.

Table 6-3 ZoI used to identify cetaceans SACs with potential connectivity to the Project.

Species	Justification	Search area
Harbour porpoise	Harbour porpoise are the most abundant cetacean species in UK waters (Reid *et al.,* 2003) and are most commonly observed along the east coast of Scotland (NMPi, 2026). Harbour porpoise are extremely mobile, nonetheless, a 50 km buffer from the Project is considered proportionate for consideration of potential connectivity from impacts from the Project.	50 km (at sea distance)
Bottlenose dolphin	The species are common in coastal waters and are mostly distributed in nearshore, shallow waters within 2 km of the coast (Quick *et al.*, 2014). Bottlenose dolphin are very mobile, nonetheless, a 50 km buffer from the Project is considered proportionate for consideration of potential connectivity from impacts from the Project.	50 km (at sea distance)

No European sites designated for the protection of harbour porpoise or bottlenose dolphin as a primary conservation feature overlap, or are within 50 km of the Project. Due to the distance to any European site for harbour porpoise, and the short-term, temporary, and transient nature of any activity resulting from the Project that could have impacts on porpoises or dolphins, no LSE resulting from the Project will occur within the boundaries of any European site designated for harbour porpoise or bottlenose dolphin.

Secondly, while these cetacean species are mobile predators, and individuals associated with a European site could theoretically occur within or close to (<50 km) the Project, any short-term, temporary and transient impacts on those individuals would not be likely to have a significant effect on the population occurring within those European sites. As such, it is considered there will be no LSE on any European site designated for cetaceans, and therefore, they have been screened out for further assessment.

6.2.2.3 European Otter

Otters in coastal habitats can hold ranges of up to 20 km, which is less than inland otter, which may have territories of up to 32 km. There are records of otters in the locality of the Project site (NBN Atlas, 2026). The Loch of Isbister SAC is a designated area for Eurasian otter which is located ~26 km from the Project. Therefore, otter have not been considered further in this assessment as no potential for effects are anticipated from activities associated with the Project.

6.2.3 Summary of European sites and Features Considered for Screening

Table 6-4 presents a summary of the SACs and qualifying features taken forward for the screening assessment within Section 9. These European sites are shown in Figure 6-1.

Table 6-4 Summary of European sites and features considered for screening assessment.

SAC Name	Marine mammal qualifying interest / feature	Distance to the Project
Sanday SAC	Harbour seal	36 km northeast (85 km at-sea)

6.2.4 Potential Pathways for LSE

The following potential pathways for LSE that have been considered for the screening assessment are:

- Construction activities:
  - Disturbance to prey species and habitats of prey species through increase in SSC;
  - Accidental release of pollutants.
  - Acoustic impacts (including physiological impacts, barrier effects and displacement) associated with construction noise (vessels and construction activities);
  - Risk of injury resulting from collisions with construction vessels;
- Operation and maintenance activities:
  - Risk of injury resulting from collision with operation and maintenance vessels.

6.3 European Sites Designated for Ornithological Features

6.3.1 Identification of European Sites and Features with Connectivity

The screening criteria approach was not used to identify European sites and features with connectivity. Instead, the selection of these sites has been informed through the consultation with NatureScot, as outlined in Table 4-1, as well as specialist judgement.

Based on the above, there are four European sites with ornithological features that have connectivity to the Project: Scapa Flow SPA; North Orkney SPA; Orkney Mainland Moors SPA; and Hoy SPA. The site details are provided in Table 6-5 below and the site's location is shown on Figure 6-1.

Table 6-5 Summary of European sites designated for ornithological features with potential connectivity to the Project

Site name	Qualifying interest / features	Distance to the Project (km)
Scapa Flow SPA	• Great northern diver (*Gavia immer*), non-breeding; • Long-tailed duck (*Clangula hyemalis*), non-breeding; • Red-breasted merganser (*Mergus serrator*), non-breeding; • Red-throated diver (*Gavia stellata*), breeding; • Shag (Phalacrocorax aristotelis), non-breeding; • Slavonian grebe (*Podiceps auritus*), non-breeding; • Black-throated Diver (*Gavia arctica*), non-breeding; and • Eider (*Somateria mollissima*), non-breeding.	Direct overlap
North Orkney SPA	• Great northern diver, non-breeding;	4 km northeast

Site name	Qualifying interest / features	Distance to the Project (km)
	• Red-throated diver, breeding; • Slavonian grebe, non-breeding; and • Velvet scoter (*Melanitta fusca*), non-breeding.	
Orkney Mainland Moors SPA	• Hen harrier (*Circus cyaneus*), breeding; • Hen harrier, non-breeding; • Red-throated diver, breeding; • Short-eared owl (*Asio flammeus*), breeding.	6 km northwest
Hoy SPA	• Arctic skua (*Pterocarpus parasiticus*), breeding; • Fulmar (*Fulmarus glacialis*), breeding; • Great black-backed gull (*Larus marinus*), breeding; • Great skua (*Stercorarius skua*), breeding; • Guillemot (*Uria aalge*), breeding; • Kittiwake (*Rissa tridactyla*), breeding; • Peregrine (*Falco peregrinus*), breeding; • Puffin (*Fratercula arctica*), breeding; • Red-throated diver, breeding; • Seabird assemblage, breeding.	16.5 km west

6.3.2 Potential Pathways for LSE

Potential pathways for LSE on ornithological features of European sites with potential connectivity to the Project have been identified. These may occur during construction activities, and operation and maintenance. The potential pathways that have been screened in for ornithological features are:

- Construction:
  - Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting);
  - Disturbance to prey species and habitats of prey species; and
  - Accidental release of contaminants or pollutants
- Operations and maintenance:
  - Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside);
  - Accidental release of contaminants; and
  - Ornithological habitat changes including potential alterations to foraging abilities.

6.4 Determination of Potential LSE

Table 6-6 presents the results of the assessment to determine potential LSE on qualifying features and habitats of European sites identified to have potential connectivity. Justification has also been provided for whether no potential LSE can be concluded. Where all potential pathways for LSE across all Project phases are discounted, then the European site has been screened out of further assessment.

Figure 6-1 illustrates the European sites that have been screened into further assessment, following the LSE Screening exercise presented below.

Table 6-6 Screening Assessment for LSE

Site Name	Qualifying Interest / Feature	Distance and direction to the Project	Project Phase	Impact pathway for LSE	LSE Screening	Screening Conclusion
Scapa Flow SPA	• Great northern diver, non-breeding; • Long-tailed duck, non-breeding; • Red-breasted merganser, non-breeding; • Red-throated diver, breeding; • Shag, non-breeding; • Slavonian grebe, non-breeding; • Black-throated Diver, non-breeding; and • Eider, non-breeding.	Direct overlap	Construction	• Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement, terrestrial blasting) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the Scapa Flow SPA given the direct overlap with the Project. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
				• Disturbance to prey species and habitats of prey species.	Construction activities required for the Project (particularly the dredging activities) have the potential to disturb the seabed and cause increased sedimentation within the water column, which could result in an adverse impact to prey species and their habitat(s). This may result in indirect effects to the qualifying features of the Scapa Flow SPA through disturbance of prey species. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
				• Accidental release of contaminants or pollutants.	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement) have the potential to result in accidental release of contaminants or pollutants which could impact the qualifying features of the Scapa Flow SPA. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
			Operation & maintenance	• Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the Scapa Flow SPA given the direct overlap with the Project. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
				• Accidental release of contaminants or pollutants.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in accidental release of contaminants or pollutants which could affect the qualifying features of the Scapa Flow SPA. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
				• Ornithological habitat changes including potential alterations to foraging abilities.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) may potentially result in changes to lower trophic levels (e.g. benthic fauna and forage fish species) which may result in changes to foraging opportunities for the qualifying features of the Scapa Flow SPA. **Therefore, there is a potential for LSE on all qualifying ornithological features of the SPA.**	Screened in.
North Orkney SPA	• Great northern diver, non-breeding; • Red-throated diver, breeding; • Slavonian grebe, non-breeding; and • Velvet scoter, non-breeding.	4 km northeast	Construction	• Disturbance of birds due to construction activities (vessel presence, onshore vehicle movement, terrestrial blasting).	Construction activities required for the Project (vessel presence and movement, onshore vehicle movement, terrestrial blasting) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the North Orkney SPA given the proximity to the Project. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter. Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	Screened in (except velvet scoter).
				• Disturbance to prey species and habitats of prey species.	Construction activities required for the Project (particularly the dredging activities) have the potential to disturb the seabed and cause increased sedimentation within the water column, which could result in an adverse impact to prey species and their habitat(s). This may result in indirect effects to the qualifying features of the North Orkney SPA through disturbance of prey species. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter. Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	Screened in (except velvet scoter).
				• Accidental release of contaminants or pollutants.	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement) have the potential to result in accidental release of contaminants or pollutants which could impact the qualifying features of the North Orkney SPA. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter.	Screened in (except velvet scoter).

Site Name	Qualifying Interest / Feature	Distance and direction to the Project	Project Phase	Impact pathway for LSE	LSE Screening	Screening Conclusion
					Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	
			Operation & maintenance	• Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the North Orkney SPA given the direct overlap with the Project. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter. Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	Screened in (except velvet scoter).
				• Accidental release of contaminants or pollutants.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in accidental release of contaminants or pollutants which could affect the qualifying features of the North Orkney SPA. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter. Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	Screened in (except velvet scoter).
				• Ornithological habitat changes including potential alterations to foraging abilities.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) may potentially result in changes to lower trophic levels (e.g. benthic fauna and forage fish species) which may result in changes to foraging opportunities for the qualifying features of the North Orkney SPA. No velvet scoter were recorded during the baseline surveys. Therefore, it is considered unlikely that this species will have connectivity with the Project via this impact pathway and there is considered to be no potential for LSE on velvet scoter. Therefore, there is a potential for LSE on qualifying ornithological features of the SPA with the exception of velvet scoter.	Screened in (except velvet scoter).
Orkney Mainland Moors SPA	• Hen harrier, breeding; • Hen harrier non-breeding; • Red-throated diver, breeding; and • Short-eared owl, breeding.	6 km northwest	Construction	• Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement, terrestrial blasting) have the potential to result in behavioural disturbance and/or displacement of the qualifying seabird features of the Orkney Mainland Moors SPA given the proximity to the Project. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. T**here is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).
				• Disturbance to prey species and habitats of prey species.	Construction activities required for the Project (particularly the dredging activities) have the potential to disturb the seabed and cause increased sedimentation within the water column, which could result in an adverse impact to prey species and their habitat(s). This may result in indirect effects to the qualifying seabird features of the Orkney Mainland Moors SPA through disturbance of prey species. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. **There is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).
				• Accidental release of contaminants or pollutants.	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement) have the potential to result in accidental release of contaminants or pollutants which could impact the qualifying seabird features of the Orkney Mainland Moors SPA. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. **There is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).

Site Name	Qualifying Interest / Feature	Distance and direction to the Project	Project Phase	Impact pathway for LSE	LSE Screening	Screening Conclusion
			Operation & maintenance	• Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in behavioural disturbance and/or displacement of the qualifying seabird features of the Orkney Mainland Moors SPA given the direct overlap with the Project. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. **There is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).
				• Accidental release of contaminants.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in accidental release of contaminants or pollutants which could affect the qualifying seabird features of the Orkney Mainland Moors SPA. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. **There is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).
				• Ornithological habitat changes including potential alterations to foraging abilities.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) may potentially result in changes to lower trophic levels (e.g. benthic fauna and forage fish species) which may result in changes to foraging opportunities for the qualifying seabird features of the Orkney Mainland Moors SPA. It is anticipated the potential for LSE will extend to red-throated diver only; hen harrier and short-eared owl are terrestrial species and therefore will have limited connectivity with the Project via this impact pathway. There is therefore no potential for LSE on the hen harrier and short-eared owl terrestrial species. **There is a potential for LSE on red-throated diver.**	Screened in (red-throated diver only).
Hoy SPA	• Arctic skua, breeding; • Fulmar, breeding; • Great black-backed gull, breeding; • Great skua, breeding; • Guillemot, breeding; • Kittiwake, breeding; • Peregrine, breeding; • Puffin, breeding; • Red-throated diver, breeding; and • Seabird assemblage, breeding.	16.5 km west	Construction	• Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement, terrestrial blasting) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the Hoy SPA given the proximity to the Project. It is anticipated the potential for LSE will extend to seabird species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	Screened in (seabird species only).
				• Disturbance to prey species and habitats of prey species.	Construction activities required for the Project (particularly the dredging activities) have the potential to disturb the seabed and cause increased sedimentation within the water column, which could result in an adverse impact to prey species and their habitat(s). This may result in indirect effects to the qualifying features of the Hoy SPA through disturbance of prey species. It is anticipated the potential for LSE will extend to seabird species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	Screened in (seabird species only).
				• Accidental release of contaminants or pollutants.	Construction activities required for the Project (dredging activities, vessel presence and movement, onshore vehicle movement) have the potential to result in accidental release of contaminants or pollutants which could impact the qualifying features of the Hoy SPA. It is anticipated the potential for LSE will extend to seabird species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	Screened in (seabird species only).
			Operation & maintenance	• Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in behavioural disturbance and/or displacement of the qualifying features of the Hoy SPA given the direct overlap with the Project. It is anticipated the potential for LSE will extend to seabird	Screened in (seabird species only).

Site Name	Qualifying Interest / Feature	Distance and direction to the Project	Project Phase	Impact pathway for LSE	LSE Screening	Screening Conclusion
				movement, and use of mobile cranes on the quayside).	species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	
				• Accidental release of contaminants or pollutants.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) have the potential to result in accidental release of contaminants or pollutants which could affect the qualifying features of the Hoy SPA. It is anticipated the potential for LSE will extend to seabird species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	Screened in (seabird species only).
				• Ornithological habitat changes including potential alterations to foraging abilities.	Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) may potentially result in changes to lower trophic levels (e.g. benthic fauna and forage fish species) which may result in changes to foraging opportunities for the qualifying features of the Hoy SPA. It is anticipated the potential for LSE will extend to seabird species only; as a terrestrial species, peregrine will have limited connectivity with the Project via this impact pathway. Therefore there is no potential for LSE on peregrine, but there is a potential for LSE on the seabird species.	Screened in (seabird species only).
Loch of Stenness SAC	• Annex I Coastal lagoons	15 km northwest	Construction	• Temporary habitat loss and/or disturbance.	All temporary habitat loss and/or disturbance of habitat is anticipated to be within the Project site only. As this SAC is located 15 km from the Project, there is no pathway for temporary loss or disturbance to features of this SAC. **Therefore, there is no potential for LSE.**	Screened out.
				• Increased SSC and associate deposition (including mobilisation of potential contaminants within the sediment).	Construction activities can disturb the seabed and cause increased sedimentation within the water column, impacting the water quality. However, any sediment suspended into the water column during construction activities will be small in volume, highly localised and temporary. As this SAC is located 15 km from the Project, there is no pathway for increased SSC and deposition to impact features of this SAC. **Therefore, there is no potential for LSE.**	Screened out.
				• Increased risk of introduction of INNS.	The movement of vessels during the construction phases of the Project, and discharge from dredging barge water ballast have the potential to result in the introduction of INNS. **Therefore, there is a potential for LSE.**	Screened in.
				• Accidental release of pollutants.	Construction activities have the potential to accidentally release pollutants into the marine environment which may result in impacts to the qualifying features of this SAC. **Therefore, there is a potential for LSE.**	Screened in.
			Operation & maintenance	• Long-term habitat loss and/or disturbance.	All long-term habitat loss and/or disturbance of habitat is anticipated to be within the Project site only. As this SAC is located 15 km from the Project, there is no pathway for temporary loss or disturbance to features of this SAC. **Therefore, there is no potential for LSE.**	Screened out.
				• Increased SSC and associated deposition.	Operation and maintenance activities can disturb the seabed and cause increased sedimentation within the water column, impacting the water quality. However, any sediment suspended into the water column during construction activities will be small in volume, highly localised and temporary. As this SAC is located 15 km from the Project, there is no pathway for increased SSC and deposition to impact features of this SAC. **Therefore, there is no potential for LSE.**	Screened out.
				• Colonisation of hard structures.	There is no potential for colonisation of hard substrate within this SAC. All potential colonisation of hard substrate from Project material on the seabed is expected within the Project footprint only. **As such, there is no potential for LSE.**	Screened out.
				• Accidental release of pollutants.	Operation and maintenance activities have the potential to accidentally release pollutants into the marine environment which may result in impacts to the qualifying features of this SAC. **Therefore, there is a potential for LSE.**	Screened in.
				• Introduction and spread of INNS.	The movement of vessels during the operation and maintenance phases of the Project, and discharge from barge water ballast have the potential to result in the introduction of INNS. **Therefore, there is a potential for LSE.**	Screened in.
Sanday SAC	• Harbour seal.	36 km northeast	Construction	• Disturbance to prey species and habitats of prey species through increase in SSC.	Construction activities can disturb the seabed and cause increased sedimentation within the water column, which may restrict visibility and make it difficult for foraging prey species resulting in habitat loss and increase sediment deposition. This may result in indirect effects	Screened in.

Site Name	Qualifying Interest / Feature	Distance and direction to the Project	Project Phase	Impact pathway for LSE	LSE Screening	Screening Conclusion
					to the qualifying features of this SAC through disturbance of prey species. **Therefore, there is potential for LSE.**	
				• Accidental release of pollutants.	Construction activities have the potential to accidentally release pollutants into the marine environment which may result in impacts to the qualifying features of this SAC. **Therefore, there is a potential for LSE.**	Screened in.
				• Acoustic impacts (including physiological impacts, barrier effects and displacement) associated with construction noise (vessels and activities).	Marine mammals can be sensitive to noise-related construction activities and may cause behavioural changes. Due to the nature of the works (dredging activities, vessel presence and movement), the construction activities could cause significant adverse impacts on marine mammals as the activities will introduce anthropogenic sound to the environment which may result in impacts to the qualifying features of this SAC. **Therefore, there is a potential for LSE.**	Screened in.
				• Risk of injury resulting from collisions with construction vessels.	It is anticipated that increased vessel traffic and dredging activities from the construction phase of the Project has the potential to increase collision risk to marine mammals that are present in and around the Project site. Whilst the likelihood of vessel collisions is dependent upon vessel speed, animal behaviour and vessel manoeuvrability, there is the potential for LSE on the qualifying features of the SAC. **Therefore, there is a potential for LSE.**	Screened in.
			Operation & maintenance	• Risk of injury resulting from collision with operation and maintenance vessels.	It is anticipated that increased vessel traffic from the operation and maintenance phase of the Project has the potential to increase collision risk to marine mammals that are present in and around the Project site. Whilst the likelihood of vessel collisions is dependent upon vessel speed, animal behaviour and vessel manoeuvrability, there is the potential for LSE on the qualifying features of the SAC. **Therefore, there is a potential for LSE.**	Screened in.
				• Accidental release of pollutants.	Operation and maintenance activities have the potential to accidentally release pollutants into the marine environment which may result in impacts to the qualifying features of this SAC. **Therefore, there is a potential for LSE.**	Screened in.

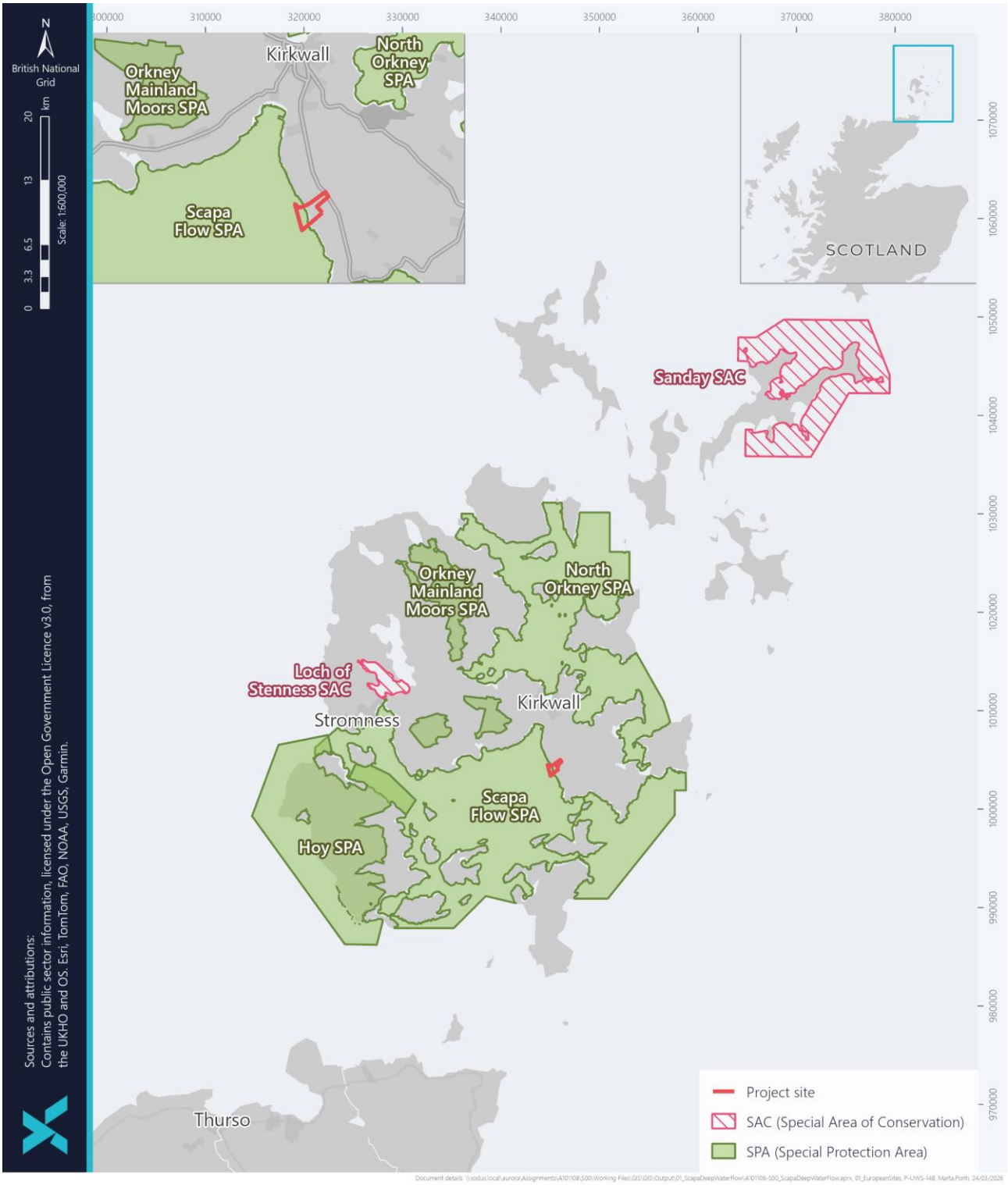


Figure 6-1 European sites screened in for assessment

7 Mitigation Plans

Table 7-1 below outlines the Schedule of Mitigation, comprising measures committed to within the EIA Report (EnviroCentre, 2023), the Supplementary Environmental Information (EnviroCentre, 2025a; 2025b) including the supporting HRA submission (Appendix B of EnviroCentre, 2025a) and the Seal Risk Assessment (Appendix D of EnviroCentre, 2025a).

These mitigation measures and plans will be used to inform the subsequent section Information to Inform Appropriate Assessment, as outlined in the methodology presented in Section 2.2.5.

Table 7-1 Schedule of Mitigation

Feature / Topic	Mitigation	Reference
Construction		
Construction Environmental Management Document (CEMD)	A CEMD will be developed and adhered to, to ensure that the mitigation measures outlined in the EIAR, HRA Report and Project consents are followed during the proposed construction works. The CEMD will be developed as a practical tool to facilitate the management of environmental mitigation measures and to provide a clear roadmap of the key roles and responsibilities during construction. All mitigation measures will be incorporated into the CEMD, which will include detailed Construction Method Statements (CMS). A Biosecurity Plan will be produced as part of the CEMD, which will set out the measures to prevent the introduction of invasive non-native species, in accordance with relevant legislation and best practice. An Outline CEMD has been produced (see Appendix I of the SEIR May 2025) and will be developed once a contractor has been appointed. The CEMD will remain a live document and will be updated as the work progresses.	
Environmental Clerk of Works (ECoW)	An ECoW will monitor the construction works to ensure that the CEMD and associated mitigation measures are implemented effectively.	
Pollution Incident Response Plan	A Pollution Incident Response Plan will be developed relating to the construction of the Project site, identifying statutory requirements and areas of highest sensitivity. This will provide site spill response procedures, emergency contact details, and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office(s) at all times.	
Turbidity Monitoring	As a precautionary measure, turbidity monitoring will be undertaken to protect water quality and ensure minimal environmental impact. Details of the monitoring, including threshold levels, will be set out in the CEMD.	
Vessel Management Plan	A Vessel Management Plans will be developed and adhered to for the construction and operational phases, with input from NatureScot, to avoid disturbance to and/or collision with birds and marine mammals. Plans will include vessel routes, speed limits and safe vessel operation, and will incorporate advice from the Scottish Marine Wildlife Watching Code[4], including: • Keep a safe distance from marine mammals. Never get closer than 100m (200m if another boat is present), but if within 100m, switch the engine to neutral; • Never drive head on to, or move between, scatter or separate marine mammals. If unsure of their movements, simply stop and put the engine into neutral; • Spend no longer than 15 minutes near the animals; • Special care must be taken with mothers and young; • Maintain a steady direction and a slow 'no wake' speed; • Avoid sudden changes in speed; and • Consider training courses such as the WiSe scheme[5].	
Ballast Water Management	• A Ballast Water Management Plan will be developed and adhered to, incorporating industry standard ballast water management practices. • The Plan will include the continuation of OICHA's biosecurity monitoring programme, as detailed in the existing Ballast Water Management Policy.	
Silt boom	A silt boom will be used to contain fine sediments if any open water reclamation work activities are undertaken.	
Marine Mammal Protection Plan (MMPP)	An Outline MMPP has been developed Appendix F of SEIR May 2025) and will be developed once a contractor has been appointed. An Outline Seal Protection Plan (SPP) has also been produced (see SEIR September 2025) and will be developed once a contractor has been appointed. This will include: • Safe vessel operation to minimise risk of collision with marine mammals (and basking shark) including adherence to the Scottish Marine Wildlife Watching Code, will be promoted to users (see also Vessel Management Plans above). • A 6 m high bund will be formed at the seaward boundary of the site by retaining the existing land and excavating behind, creating a natural noise screen from terrestrial blasting (and other works) and will only be removed once the site is excavated to the final profile.	

[4] https://www.nature.scot/doc/scottish-marine-wildlife-watching-code-smwwc
[5] Information available at: https://www.wisescheme.org/ (accessed 02/06/2023)

Feature / Topic	Mitigation	Reference
Construction and Operation & Maintenance		
Pollution Prevention Plan	Part of the CEMD will include pollution prevention measures (e.g., Pollution Prevention Plan) that will be in place during construction will include measures to deal with accidental spillages.	
Vessel Management Plan	A Vessel Management Plans will be developed and adhered to for the construction and operational phases, with input from NatureScot, to avoid disturbance to and/or collision with birds and marine mammals. Plans will include vessel routes, speed limits and safe vessel operation, and will incorporate advice from the Scottish Marine Wildlife Watching Code[6], including: • Keep a safe distance from marine mammals. Never get closer than 100m (200m if another boat is present), but if within 100m, switch the engine to neutral; • Never drive head on to, or move between, scatter or separate marine mammals. If unsure of their movements, simply stop and put the engine into neutral; • Spend no longer than 15 minutes near the animals; • Special care must be taken with mothers and young; • Maintain a steady direction and a slow 'no wake' speed; • Avoid sudden changes in speed; and • Consider training courses such as the WiSe scheme[7].	

[6] https://www.nature.scot/doc/scottish-marine-wildlife-watching-code-smwwc
[7] Information available at: https://www.wisescheme.org/ (accessed 02/06/2023)

8 Annex I Habitats – Information to Inform Appropriate Assessment

8.1 Introduction

This section provides an assessment of the potential for the Project to result in an Adverse Effect on Site Integrity (AEoSI) on SACs designated for the conversation of Annex I habitats. An assessment of the potential for the Project to result in an AEoSI is provided for the Project-alone and for the Project in combination with other projects, plans and activities.

8.1.1 Screening Outcome

The European sites, Annex I habitat qualifying features and relevant impact pathway where LSE could not be excluded as part of the LSE Screening process are as follows:

Table 8-1 Qualifying features and associated European sites screened in for potential LSE

Site name	Annex I Habitat qualifying interest features /	Project phase	Impact pathways screened in for potential LSE
Loch of Stenness SAC	Annex I coastal lagoons	Construction	Increased risk of introduction of INNS.
			Accidental release of pollutants.
		Operation & maintenance	Increased risk of introduction of INNS.
			Accidental release of pollutants.

This assessment includes consideration of potential impacts to coastal lagoon Annex I habitat as the qualifying feature of the Loch of Stenness SAC only. All other European Sites with Annex I habitat qualifying features have been screened out, as detailed in Section 6, on the basis that LSE could be excluded.

8.2 Assessment Approach

8.2.1 Project Design Envelope Parameters

This section outlines the Project Design Envelope Parameters to support the assessment of the impact pathways screened in to this Information to Inform Appropriate Assessment, as determined from the Project Description presented in Section 5.

8.2.1.1 Vessel movements during construction

Per Table 5-3, the construction phase will see a total of 112 vessel movements over the 26-month period. This includes: Caisson deliveries and tug operations; Scour protection trips; Caisson infill trips; and Dredging disposal trips (barge to FI040).

8.2.1.2 Vessel movements during operation

Per Section 5.4.1. there will be an estimated 192 operational vessel movements per year (approximately 154 in the summer months [April - September inclusive] and 38 in the winter [October – March inclusive]).

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 6 vessel movements per month on average (+0.3% from baseline) during winter months (October-March) and an additional 26 vessel movements per month on average (+1.0% from baseline) during summer months (April-September).

8.2.1.3 Dredging method and duration

Dredging for the project will involve a total of 379,407 m³ of material, comprising 72,653 m³ of hard dredge and 306,754 m³ of soft dredge, with up to 82,000 m³ of unsuitable glacial till potentially requiring sea disposal. A single dredge campaign is planned using a cutter suction dredger over an estimated twelve-week period from June to August 2028, covering the full quay alignment to depths of –15 m CD in most areas and –20 m CD in the deep pocket.

Dredged sediments will be pumped through a pipeline into a reclamation bund constructed to +4.0 m CD using screened site-won material, with an integrated weir box to manage overflow. Turbidity will be monitored outside the bund and silt booms deployed during infilling.

8.2.1.4 Ballast water and caisson transport

Caissons will be transported to site on a semi-submersible vessel and kept dry during transit, which significantly reduces the risk of biofouling. After placement at Scapa Flow, ballasting operations will use local seawater, and some caissons may undergo temporary in-water wet storage before installation.

8.2.1.5 Mitigation and Monitoring

Table 7-1 outlines the Schedule of Mitigation the Project has committed to during both construction and operation phases. Those specifically related to this Annex I assessment (based on the impact pathways screened in) include:

- Adherence to a CEMD;
- Use of an ECoW;
- Pollution Incident Response Plan;
- Turbidity Monitoring;
- Use of a silt boom during construction;
- Ballast Water Management;
- Pollution Prevention Plan.

8.2.2 In-combination Assessment

Projects within the locality of the Loch of Stenness SAC are considered to have the potential to result in in-combination effects on Annex I habitats as qualifying interests of protected sites. The plans and projects considered for the in-combination assessment in relation to the Loch of Stenness SAC are outlined in Table 8-2.

Table 8-2 Plans and projects considered for the in-combination assessment of benthic features

Plan or Project	Development type	Status	Distance from Project
North Coast and Orkney regional cable surveys	Cables	Consented	Various
SSEN Orkney to Caithness HVAC	Cables	Under construction	22 km

8.3 Loch of Stenness SAC

8.3.1 Site Description and Qualifying Features

The Loch of Stenness SAC covers an area of 792.59 ha and is a large, predominantly brackish lagoon situated on Mainland, Orkney (NatureScot, 2025b). It forms part of a linked hydrological system with the neighbouring Loch of Harray, and together these lochs constitute the largest lagoon complex in the UK. This SAC is located 15 km northwest of the Project site.

The loch is characterised by a single basin lagoon system typical of Orkney's coastal lagoon features, exhibiting attributes of both silled lagoons and lagoonal inlets. It is recognised as the largest brackish lagoon in the UK, with a stable and reduced-salinity regime. The brackish nature of the lagoon results from the partial connection to adjacent marine waters at Brig o' Waithe, where tidal currents influence salinity but cause limited water-level variation. Consequently, the system maintains a mixture of marine, brackish, and freshwater conditions across its extent. The feature condition and broader conservation status of the qualifying feature is presented in Table 8-3.

Table 8-3 Protected feature and condition for the Loch of Stenness SAC (NatureScot, 2025b)

Protected feature	Feature condition	Assessment date	Broader conservation status
Lagoon	Favourable, maintained	2003	Unfavourable – Inadequate

8.3.2 Conservation Objectives

The Conservation Objectives of the Loch of Stenness SAC (NatureScot, 2025b) are:

1. To ensure that the lagoons at Loch of Stenness SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of Loch of Stenness SAC is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for lagoons:
    - 2a. Extent and distribution of the habitat within the site.
    - 2b. Structure and function of the habitat and the supporting environment on which it relies.
    - 2c. Distribution and viability of typical species of the habitat.

As the most recent condition status of the lagoon feature was 'favourable', the Conservation Objectives seek to *Maintain* this condition. Supplementary conservation and management advice to support the achievement of the conservation objectives is provided by NatureScot (2025b) and is considered in the assessments below.

8.3.3 Assessment of Adverse Effects Alone

8.3.3.1 Introduction of INNS (all phases)

8.3.3.1.1 Assessment of Adverse Effects Alone

Project activities may introduce INNS capable of altering lagoon ecology through changes to habitat structure, competition with native biota, or modification of ecological processes. The potential for introduction or spread of INNS may arise from the following Project activities:

- Vessel movements;
- Ballast water transfer and sediment residues;
- Marine plant, animal, or microbial species transported on hulls, equipment, or dredging infrastructure; and
- Possible transfer of propagules to or from dredging and dredge-disposal locations.

The Project includes dredging at the proposed quay site, with dredge disposal at FI040 Stromness A, located outside Scapa Flow. The disposal site lies approximately 15 km direct (or ~24 km at-sea-distance) from the Loch of Stenness SAC.

The dredge volume is estimated to be 379,407m^3, based on bathymetry surveys and proposed berth design. The dredge material comprises approximately 17% gravel, 68% sand, and 15% silt and clay.

Dredging represents a major pathway for the movement of INNS and pollutants, as dredging and sediment transport can introduce INNS via equipment, sediment, or water movement, mobilise contaminants within seabed sediments, generate plumes that spread pollutants, and facilitate potential INNS transfer through disposal at site FI040.

The dredge plume dispersal modelling (Technical Appendix 4.1, Volume 3 of the EIAR; EnviroCentre, 2023) indicates that due to the relatively coarse nature of the dredge budget, and the weak tidal currents within the vicinity of the dredge pickets, plumes generated as a result of the dredging works will be very localised, and short-term in duration. Low current speeds mean that sands and gravels lost to the water column during dredging will fall out of suspension immediately, within the dredge footprint. Clay and silt lost to the water column will remain in suspension for longer, being dispersed gradually over the tidal cycle. Total SSC are predicted to be low, highest within the dredge zone and immediate surroundings, decreasing towards the plume limits.

The Project site is characterised by coarse sediment, lack of significant transport inputs and prevailing weak tidal currents. This results in no significant local sediment transport processes, other than the occasional storm wave driven transport of glacial materials. Chapter 4 of the EIAR (EnviroCentre, 2023) concluded that during the construction phase, the magnitude of impact from sediment discharge and dispersion on the coastal waters and sediment of Scapa Flow, and the magnitude of impact from changes to sediment transport on the coastal waters and sediment of Scapa Flow will be negligible following the implementation of the mitigation measures presented in Section 7. The magnitude of impact for these two impact pathways during the operational phase was also concluded to be negligible following implementation of the mitigation measures presented in Section 7.

The dredge plume dispersion is spatially limited and short-term in duration, the disposal site is located outwith Scapa Flow, and sediment transport modelling indicates negligible potential for connectivity with the lagoon system of Loch of Stenness SAC. Therefore, there is no potential for connectivity through which Project activities, such as dredging or disposal, could facilitate the introduction or spread of INNS to the Annex I lagoon habitat.

The suite of proposed construction and operational mitigations collectively reduces the risk of introducing or spreading INNS by ensuring robust environmental control, biosecurity awareness and best-practice site management. Adherence to the CEMD, supported by oversight from the ECoW will ensure that all site (on- and offshore) activities follow controlled methods that minimise movement of contaminated materials, while the Pollution Incident Response Plan and Pollution Prevention Plan reduce opportunities for pollutants or mobilised sediments to act as pathways for INNS transfer. Measures such as silt booms and careful dredging protocols will act to limit sediment disturbance and prevent the release and dispersal of propagules.

The Vessel Management Plan and Ballast Water Management Plan will further control vessel movements, ballast discharge and water exchange, key pathways for marine INNS, while adherence to industry-standard biosecurity practices provides an added safeguard.

As a precautionary measure during construction, the Project proposes to undertake turbidity monitoring to protect water quality and ensure minimal environmental impact. The Project propose to monitor sediment re-suspension levels to prevent damage to the local ecosystem as high sediment concentrations can contribute to suboptimal conditions By monitoring turbidity, the Project can determine potential impacts on the environment and implement corrective actions.

The combination of mitigation and the intervening distance between the Project and the SAC ensures that no viable impact pathway exists for INNS introduction that could affect the lagoon feature's structure, function, or conservation status.

With the implementation of the mitigation outlined above (see Table 7-1), and considering the spatially limited and highly localised nature of dredging effects and the lack of hydrodynamic connectivity with the SAC lagoon system, it can be concluded that the predicted impacts on the Annex I coastal lagoon qualifying feature of the Loch of Stenness SAC from the Project alone would **not adversely affect the integrity of the site.**

8.3.3.2 Accidental Release of Pollutants (all phases)

8.3.3.2.1 Assessment of Adverse Effects Alone

Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on Annex I coastal lagoon features. The potential for accidental pollutant release may arise from the following Project activities:

- Vessel activity (fuel, oils, lubricants, hydraulic fluids);

- Refuelling, maintenance, and engine operation;
- Accidental spills of construction-related materials; and
- Loss of containment from plant, machinery, or storage facilities.

8.3.3.2.1.1.1
The main risk is considered to be posed by refuelling activities. Oil or fuel spillages to the water environment would be detrimental to the water and sediment quality, fauna and flora.

Release of toxic materials during dredging is not considered to be likely as sediment sampling found no contaminants at levels likely to significantly affect water quality or pose a hazard to marine life (EnviroCentre, 2023).

The SAC is located ~15 km from the Project site, and the lagoon system is semi-enclosed which further limits connectivity with potential pollutants accidentally released at the Project site. Given the Project's distance from the SAC, and the hydrodynamically contained nature of the Loch of Stenness lagoon system which characterised by limited water exchange, stability, and an enclosed basin morphology, pollutant transport from the Project area to the SAC is highly unlikely. Additionally, there is no direct hydrodynamic pathway linking the Project activities to the lagoon.

As outlined in section 8.3.3.2, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments. The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs. As such, there is no pathway by which accidental pollutant release at the Project site could affect the lagoon qualifying feature of the Loch of Stenness SAC.

Considering the mitigation measures outlined above, and the geographical and hydrodynamic separation between the Project and the Loch of Stenness lagoon, it is concluded that the predicted impacts on the lagoon qualifying feature of the Loch of Stenness SAC from the Project-alone will **not adversely affect the integrity of the site**.

8.3.4 Assessment of Adverse Effects In-Combination

Two projects have been screened in for LSE on the qualifying features of Loch of Stenness SAC:

- Scottish Hydro Electric Power Distribution (SHEPD) North Coast and Orkney regional cable surveys; and
- SSEN Orkney to Caithness 220 kV high voltage alternating current (HVAC) cable.

8.3.4.1 Cable installation and surveys

There are two projects with the potential for LSE on Loch of Stenness SAC: the SSEN Orkney-Caithness HVAC link cable, and SHEPD cable route surveys. Both projects will take place from one or more vessels operating in the locality of the Loch of Stenness SAC.

As with the Project alone assessment, standard mitigation will be in place to prevent the release of pollutants and contaminants, and to avoid the introduction of INNS. These measures reduce the risk of adverse effects on Loch of Stenness SAC to negligible levels and any impacts are highly unlikely.

8.3.4.2 In-combination summary

Given the negligible cumulative effects on the qualifying features of the Loch of Stenness SAC resulting from the Project, in combination with the two cables projects referred to in this assessment, it is concluded that there will be no adverse effects on site integrity as a result of the Project in combination with any other plans and projects.

8.3.5 Summary

It has been determined that impacts both from the Project alone, and in combination with other plans and projects, will not have an adverse effect on site integrity, with respect to the qualifying features of the Loch of Stenness SAC.

9 Annex II Marine Mammals - Information to Inform Appropriate Assessment

9.1 Introduction

This section provides an assessment of the potential for the Project to result in an AEoSI on SACs designated for the conservation of marine mammals. An assessment of the potential for the Project to result in an AEoSI is provided for the Project-alone and for the Project in combination with other projects, plans and activities.

9.1.1 Screening Outcome

The European sites, Annex II marine mammal qualifying features and relevant impact pathway where LSE could not be excluded as part of the LSE Screening process are as follows:

Table 9-1 Qualifying features and associated European sites screened in for potential LSE

Site name	Annex II qualifying interest	Project phase	Impact pathways screened in for potential LSE
Sanday SAC	Harbour seal	Construction	Disturbance to prey species and habitats of prey species through increase in SSC.
			Accidental release of pollutants.
			Acoustic impacts (including physiological impacts, barrier effects and displacement) associated with construction noise (vessels and activities).
			Risk of injury resulting from collisions with construction vessels.
		Operation & maintenance	Risk of injury resulting from collision with operation and maintenance vessels.

As outlined in section 6.2.2, the Sanday SAC harbour seal features have been screened in due to the significant decline of harbour seals in Orkney and evidence that individuals forage beyond standard screening distances. NatureScot has also required their inclusion, considering seals in Scapa Flow to be connected to the SAC.

This assessment includes consideration of potential impacts to harbour seal Annex II marine mammal as the qualifying feature of the Sanday SAC only. All other European Sites with Annex II marine mammal qualifying features have been screened out, as detailed in Section 6, on the basis that LSE could be excluded and as agreed in the consultation with stakeholders (Table 4-1).

9.2 Assessment Approach

9.2.1 Project Design Envelope Parameters

This section outlines the Project Design Envelope Parameters to support the assessment of the impact pathways screened in to this Information to Inform Appropriate Assessment, as determined from the Project Description presented in Section 5.

9.2.1.1 Vessel movements during construction

Per Table 5-3, the construction phase will see a total of 112 vessel movements over the 26-month period. This includes: Caisson deliveries and tug operations; Scour protection trips; Caisson infill trips; and Dredging disposal trips (barge to FI040).

9.2.1.2 Vessel movements during operation

Per Section 5.4.1. there will be an estimated 2, 192 operational vessel movements per year (approximately 154 in the summer months [April - September inclusive] and 38 in the winter [October – March inclusive]).

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 6 vessel movements per month on average (+0.3% from baseline) during winter months (October-March) and an additional 26 vessel movements per month on average (+1.0% from baseline) during summer months (April-September).

9.2.1.3 Dredging method and duration

Dredging for the project will involve a total of 379,407 m³ of material, comprising 72,653 m³ of hard dredge and 306,754 m³ of soft dredge, with up to 82,000 m³ of unsuitable glacial till potentially requiring sea disposal. A single dredge campaign is planned using a cutter suction dredger over an estimated twelve-week period from June to August 2028, covering the full quay alignment to depths of –15 m CD in most areas and –20 m CD in the deep pocket.

Dredged sediments will be pumped through a pipeline into a reclamation bund constructed to +4.0 m CD using screened site-won material, with an integrated weir box to manage overflow. Turbidity will be monitored outside the bund and silt booms deployed during infilling.

9.2.1.4 Ballast water and caisson transport

Caissons will be transported to site on a semi-submersible vessel and kept dry during transit, which significantly reduces the risk of biofouling. After placement at Scapa Flow, ballasting operations will use local seawater, and some caissons may undergo temporary in-water wet storage before installation.

9.2.1.5 Mitigation and Management Plans

Section 7 outlines the Schedule of Mitigation the Project has committed to during both construction and operation phases. Those specifically related to this Annex II assessment (based on the impact pathways screened in) include:

- Adherence to a CEMD;
- Use of an ECoW;
- Pollution Incident Response Plan;
- Turbidity Monitoring;
- Vessel Management Plan;
- Marine Mammal Observer;
- Use of a silt boom during construction;
- Seal Protection Plan
- Marine Mitigation Zone
- Ballast Water Management;
- Marine Mammal Protection Plan;
- Dredging Protocol
- Pollution Prevention Plan;
- Best Practice.

9.2.2 In-combination Assessment

Other developments within Orkney are considered to have the potential to result in an in-combination effect for marine mammals. The developments that have been considered for the in-combination assessment are listed in Table 9-2, based on the long-list provided in Appendix E: Long List of In-Combination Projects.

The West of Orkney Windfarm has been screened out of the in-combination assessment because vessel movements associated with the use of the SDWQ are already included within the Project-alone assessment. Therefore, including the West of Orkney Windfarm within the in-combination assessment on this basis would result in double-counting of the same vessel activities. Any other construction vessels associated with the West of Orkney Windfarm that do not utilise the SDWQ would have no pathway for interaction with the SPA features considered in this assessment, and therefore would not adversely affect the integrity of the site. Thus, no additional in-combination effects are predicted.

Table 9-2 Plans and projects considered for the in-combination assessment of marine mammal features

Project	Development type	Status	Relevant receptors	Distance from Project
Ayre offshore wind farm	Offshore wind farm	Application	Harbour seal	36 km
Westray Tidal Array (Orbital)	Tidal energy	Scoping	Harbour seal	27 km
Fall of Warness tidal test site (EMEC)	Tidal energy	Application	Harbour seal	24 km
Bilia Croo wave test site (EMEC)	Wave energy	Application	Harbour seal	25 km
Deerness Wave Site (Mocean)	Wave energy	Application	Harbour seal	13 km
North Coast and Orkney regional cable surveys	Cables	Consented	Harbour seal	Various
Backaland Pier, Eday	Port development	Application	Harbour seal	28 km
Scammalin Pier, Faray	Port development	Consented	Harbour seal	33 km
Hatston Pier Expansion	Port development	Application	Harbour seal	9 km
Stronsay Harbour	Dredging	Application	Harbour seal	32 km
Hatston Pier	Dredging	Application	Harbour seal	9 km
Scammalin Pier, Faray	Dredging	Consented	Harbour seal	33 km

9.3 Sanday SAC

9.3.1 Site Description and Qualifying Features

The Sanday SAC covers an area of 10,976.97 ha (109.76 km^2) and is a large, low-lying island situated in the north-east of the Orkney archipelago (NatureScot, 2025c). The island has a complex coastline characterised by extensive sandy beaches, sheltered inlets and exposed rocky headlands. The Sanday SAC also supports the largest discrete group of harbour seals in Scotland, with associated nearshore kelp beds providing important foraging areas for this population (JNCC, 2021). The SAC is located 36 km northeast of the Project site (or ~85 km at-sea-distance).

The coastal waters of Sanday hold the largest colony of harbour seals at any relatively discrete site in Scotland. Around 1,450 adults haul out on the intertidal reefs to pup, moult and rest. This represents around 17% of the Orkney, 5% of the UK and 2% of the EU populations of the species. During the 1998 breeding survey (SCOS, 2024), over 550 pups were observed at the site, accounting for 34% of newborn pups in Orkney. Large breeding colonies are important in maintaining overall population size and are significant as sources of emigration to smaller or newly established groups. The status of harbour seals at Sanday is unfavourable, declining, with a significant decline in numbers since the designation. Based on counts from 1997-2019, there has been a decline of 95% at Sanday SAC, indicating it is one of the local areas hit hardest by the harbour seal declines observed in northern and eastern areas of Scotland. In the last count in 2019, the SAC represented 77 individuals (around 5% of the North Coast and Orkney Seal Management Unit (SMU))[8] (SCOS, 2024). This is reflected across the whole of Orkney, where populations have declined by ~90%. The Sanday conservation management advice suggests that research indicates that off-site factors such as predation, competition for prey, prey quality and availability, and toxin exposure from harmful algae are the most likely potential causes of the decline. For harbour seal at Sanday SAC, the reasons for the unfavourable condition appear to lie outwith the SAC.

The feature condition and broader conservation status of the qualifying feature is presented in Table 9-3.

Table 9-3 Protected feature and condition for the Sanday SAC (NatureScot, 2025c)

Protected feature	Feature condition	Assessment date	Broader conservation status
Harbour seal	Unfavourable: declining	2023	Unfavourable - inadequate

9.3.2 Conservation Objectives

The Conservation Objectives of the Sanday SAC (NatureScot, 2025c) are:

1. To ensure that the qualifying features of Sanday SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of Sanday SAC is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

For Harbour seal:

- 2a. Harbour seal are a viable component of the Sanday SAC.
- 2b. The distribution of harbour seal throughout the site is maintained by avoiding significant disturbance.
- 2c. The supporting habitats within the site relevant to harbour seal are maintained.

As the most recent condition status of the harbour seal feature was ‘unfavourable’, the Conservation Objectives seek to Restore this condition. Supplementary conservation and management advice to support the achievement of the conservation objectives is provided by NatureScot (2025c) and is considered in the assessments below. Assessment of Adverse Effects Alone

[8] Orkney was counted again in 2025 but the numbers have not yet been published.

The Sanday SAC is located approximately 85 km from the Project site (at-sea-distance). Harbour seals have typical foraging ranges of ~50 km, with telemetry data showing individuals from the SAC may range 20–100 km, though predominantly at the shorter end of this range. Telemetry studies further indicate limited connectivity between tagged Sanday SAC seals and the Project site (Marine Scotland, 2016). Although the Project site is not considered to be widely used by seals originating from the SAC, the presence of individuals from the Sanday SAC population in the waters around the Project site cannot be ruled out.

9.3.2.1 Disturbance to prey species and habitats of prey species through increase in SSC (construction phase only)

9.3.2.1.1 Assessment of Adverse Effects Alone

Increases in SSC arising from Project dredging activities during construction have the potential to affect harbour seals indirectly by altering the availability or behaviour of their prey.

Hydrodynamic modelling (Technical Appendix 4.1, Volume 3 of the EIAR; EnviroCentre, 2023) shows that tidal currents in the dredge area are weak, resulting in only highly localised and short-lived sediment plumes. The composition of the dredge material—approximately 17% gravel, 68% sand and 15% silt and clay—means that most sediment will settle quickly, limiting any meaningful dispersion of SSC beyond the immediate dredge footprint. Section 8.3.3.1 of the EIAR (EnviroCentre, 2023) concluded that impacts from sediment discharge and dispersion on the coastal waters and sediment of Scapa Flow, and the magnitude of impact from changes to sediment transport on the coastal waters and sediment of Scapa Flow, will be negligible following the implementation of the mitigation measures presented in Section 7 for the construction phase.

Proposed reclamation fill activities could also result in plumes and increased SSC, with a resultant impact on prey species. The fill material will be a mixture of sediment locally generated by quarries and dredging, the coarse nature of which, in combination with locally weak tidal currents, will limit the duration and spread of any plume generated.

Chapter 5 of the EIAR (EnviroCentre, 2023) states that impact on prey species will be temporary and spatially restricted (Section 5.6.3.1 of EnviroCentre, 2023), and confirmed that there is sufficient alternative habitat for foraging and commuting for harbour seal individuals. For these reasons, section 5.6.3.1 and Table 5-9 of EnviroCentre (2023) concluded that indirect impacts on Sanday SAC harbour seals, as a result of impacts to prey species, will be not significant during construction.

Construction impacts to fish species, from underwater noise and pollution, was assessed as being of low magnitude and not significant in the EIAR (EnviroCentre, 2023), due to the limited spatial extent (i.e. restricted to discrete areas near the dredging and reclamation areas), the relatively short-term duration (as it is limited to the duration of the dredging activities), intermittent nature and high reversibility.

As a precautionary measure during construction, the Project proposes to undertake turbidity monitoring to protect water quality and ensure minimal environmental impact. The Project propose to monitor sediment re-suspension levels to prevent damage to the local ecosystem and aquaculture as high sediment concentrations can contribute to suboptimal conditions and may harm aquaculture fish since it affects the overall ecological balance and the fish have restricted movement. By monitoring turbidity, the Project can determine potential impacts on the environment and implement corrective actions. Furthermore, silt booms will be utilised to contain fine sediments while reclamation works are undertaken, to minimise the spread of sediments and thus disturbance to prey species in the marine environment.

Measures such as silt booms and careful dredging protocols will act to limit sediment disturbance and prevent the release and dispersal of sediments.

Any SSC increases will be confined to a very small spatial area and short-term duration, and will not extend into wider foraging grounds used by harbour seals from the Sanday SAC. The supporting habitats for prey species beyond the Project site will therefore remain unaffected. Based on this and the mitigation measures outlined above, there is no credible mechanism by which SSC arising from the Project could lead to reduced foraging success or altered behaviour of harbour seals linked to the SAC by indirectly impacting prey species. As such, it can be concluded that the predicted impacts on the Annex II marine mammal qualifying feature of the Sanday SAC from the Project alone would **not adversely affect the integrity of the site**.

9.3.2.2 Accidental Release of Pollutants (all phases)

9.3.2.2.1 Assessment of Adverse Effects Alone

Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on Annex II marine mammal features. The potential for accidental pollutant release may arise from the following Project activities:

- Vessel activity (fuel, oils, lubricants, hydraulic fluids);
- Refuelling, maintenance, and engine operation;
- Accidental spills of construction-related materials; and
- Loss of containment from plant, machinery, or storage facilities.

The main risk is considered to be posed by refuelling activities. Oil or fuel spillages to the water environment would be detrimental to the water and sediment quality, fauna and flora. Accidental releases of pollutants pose a potential risk to marine mammals and their prey through degradation of water quality.

Release of toxic materials during dredging is not considered to be likely as sediment sampling found no contaminants at levels likely to significantly affect water quality or pose a hazard to marine life (EnviroCentre, 2023).

As outlined in section 8.3.3.2, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments. The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

Furthermore, it is understood that that there is sufficient alternative habitat for foraging and commuting for harbour seal individuals outwith the Project site. In this manner, accidental release of potential contaminants from construction vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

Considering the mitigation measures outlined above, and the availability of sufficient alternative habitat for foraging and commuting for harbour seal individuals, it can be concluded that the predicted impacts on the Annex II marine mammal qualifying feature of the Sanday SAC from the Project alone would **not adversely affect the integrity of the site**.

9.3.2.3 Acoustic Impacts (construction phase only)

9.3.2.3.1 Assessment of Adverse Effects Alone

Construction activities such as dredging will result in underwater sound sources which may cause injury to harbour seal qualifying features of the Sanday SAC.

Modelling of underwater noise (Technical Appendix 5.6 of the 2023 EIAR; EnviroCentre, 2023) shows that the potential for Permanent Threshold Shift (PTS) for harbour seals is restricted to within 50 metres of the activity,

meaning that injury is unlikely as seals are capable of moving away before accumulating damaging levels of exposure. Temporary Threshold Shifts (TTS) may occur within ranges of approximately 70–250 metres depending on the duration of exposure, although such effects would only arise if an animal remained close to the activity for an extended period. Given the mobility of harbour seals and their known behavioural tendency to avoid sudden or elevated noise sources, prolonged exposure is considered unlikely. Any effects will therefore be limited to temporary, short-range displacement of individuals, with normal behaviour quickly resuming once dredging ceases (Section 5.6.8.1 of the EIAR; EnviroCentre, 2023).

The area around the Project site does not contain important breeding, mating or resting habitat for harbour seals (the nearest designated haul-out site is Selwick, located 4.5 km to the south), and alternative foraging habitat is widely available. Given that seals occur commonly in busy harbours, they are somewhat habituated to anthropogenic noise sources. As such, the consequences of disturbance are not thought to be significant and harbour seals are not considered to be sensitive to acoustic disturbance from continuous sound sources such as dredging.

Quantitative analysis using a conservative 5 km disturbance buffer (as informed by NatureScot consultation) suggests that up to 33 seals could be disturbed at any one time, although this is recognised as a worst-case overestimate and actual numbers would likely be lower than calculated. It is possible that seals subject to general disturbance could be associated with the Sanday SAC. However, given the scale and short temporal and spatial scales of the dredging activities, the distance between the works and the SAC and evidenced limited connectivity between Sanday SAC and the proposed dredging activities, it is considered that limited impacts from dredging activities would occur.

The Project has proposed mitigation measures (Table 7-1) to collectively reduce acoustic disturbance and risk of injury to seals by managing when, where and how noisy activities occur, and by ensuring continuous monitoring of marine mammals throughout construction. Deployment of trained MMOs and ECoWs enables early detection of seals in the vicinity of dredging or terrestrial blasting works, allowing activities to be delayed until animals have moved outside the defined mitigation zone, thereby preventing exposure to harmful sound levels.

The Marine Mammal Protection Plan and Seal Protection Plan add additional safeguards by defining noise-dampening measures such as screens and bunding for terrestrial blasting. Measures within the Vessel Management Plan include agreed routes, slow-speed zones and training in wildlife-sensitive operations to reduce vessel-generated disturbance. Collectively, these controls ensure that underwater noise is closely managed, monitored and reduced at source, thereby significantly mitigating both behavioural disturbance and potential auditory injury to seals.

Noise from terrestrial blasting associated with the construction phase could cause disturbance to seals on land. However, seals are unlikely to be hauled out in or close to the construction site, thereby reducing the risk of injury or disturbance. Furthermore, blasting operations regularly generate air overpressure levels at the closest point to blast area of around 120 dB but the intensity of these noise levels experienced at a distance from the blast site are affected by a range of meteorological conditions (wind speed and direction, temperature, cloud cover and humidity) and when sound waves pass a given position, the pressure of the air rises very rapidly then falls more slowly then returns to the ambient value after a number of oscillations. As such, it is unlikely that qualifying seal features of the Sanday SAC would be impacted. A 6 m high bund will be formed at the seaward boundary of the site by retaining the existing land and excavating behind, creating a natural noise screen from terrestrial blasting (and other works) and will only be removed once the site is excavated to the final profile. This would reduce the effects of noise on seals on land. In addition, a range of other controls and mitigation measures will be implemented (Table 7-1) when undertaking terrestrial blasting, including screens to further dampen sound, which would also reduce the effects of noise on seals on land or at the water's surface.

Overall, while underwater and terrestrial sound sources may cause temporary behavioural disturbance to a small number of individual seals, these effects are expected to be localised, short-term and not significant at the population level. Acoustic impacts will be minimised by the implementation of mitigation measures, including use of a MMO and dredging protocol committed to within the Marine Mammal Protection Plan (Table 7-1). As such, it can be concluded that the predicted impacts on the Annex II marine mammal qualifying feature of the Sanday SAC from the Project alone would **not adversely affect the integrity of the site**.

9.3.2.4 Risk of Injury and Disturbance from Vessels (all phases)

9.3.2.4.1 Assessment of Adverse Effects Alone

Construction and operational vessel movements have the potential to increase the risk of vessel collisions with harbour seals.

Impacts associated with disturbance from increased vessel movements will be intermittent during construction and operation, with the increase being relatively small (see paragraph below), and it is considered that seals utilising waters around the Project site will be somewhat habituated to vessel activity associated with Scapa Pier and the oil industry-related activities in the wider Scapa Flow. For example, telemetry-based studies (Onoufriou., *et* al, 2016)) of the swimming behaviour of seals undertaken by the Sea Mammal Research Unit carried out in the Moray Firth to compare seal and vessel movements with the purpose of identifying potential areas with high spatial overlap found the movements of individual seals and vessels did not show any apparent responses, with seals not appearing to react to close passing vessels (not moving towards nor away from them). In addition, the majority of the routes used by these vessels during construction and operation will be along established routes (i.e., the main shipping channel and the shipping lane west towards Stromness). The only area of increased vessel activity will be the route of 2.9 km (1.6 NM) leading from the main shipping lane into the Project (see Appendix C: Bird Heat Maps and HiDef Data Combined with Construction Vessel Routes). If there is some displacement from areas of high activity during construction or operation, it is considered that there is sufficient alternative habitat for foraging and commuting.

During construction, approximately 42 vessel movements over a 12-week period (between June – August 2028) are expected for the dredge disposal for the Project. 70 vessel movements are expected for works associated with caisson delivery, scour protection and caisson installation. This equates to 112 vessel movements in total during construction, which is considered a relatively low number of vessel movements over the length of the period of works (26 months in total). Vessel strikes are generally more associated with larger and less agile marine mammals, and so the number of harbour seals affected will likely be minimal. The effects of these impacts will be highly localised around the established shipping routes. In addition, although larger vessels have a greater footprint and therefore may be considered more likely to make encounters with seals, Project vessels will travel at relatively slow speeds with a consistent course, which is considered less detrimental to seals than smaller vessels. The likelihood of vessel collisions is dependent upon vessel speed, animal behaviour and vessel manoeuvrability. Vessels travelling at slower speeds in general can allow time for seals and vessel operators to react to avoid collisions. A Seal Protection Plan will be implemented and adhered to, which details protocols to be implemented to reduce collision risk. This includes limits on vessel speed.

During the operational phase, the estimated number of vessels calling at the Project Quay in the operational phase is 96 per year (192 vessel movements), comprising 28 large vessels and 12 smaller vessels per year. Each of the 28 large vessels will have two associated pilot boat (2 vessel movements). In total, the estimated vessel movements per year is 192.

The majority of these vessels (approximately 80 %) are expected to occur during the summer months (April – September), so there will be an increase of 26 vessel movements per month in summer and 6 per month in winter. As with the construction phase vessel movements, the effects of the operational phase impacts will be highly spatially localised. As the majority of the vessel routes will be using existing routes, seals will likely already be habituated to vessels in those areas and/ or avoid the area already. In the area of increased vessel activity close to the Project site, there is a greater likelihood of vessel collision with seals, however, the vessel numbers in this area are very low, as stated above, and over time, seals would likely become habituated to vessels using this route. Again, as above, the likelihood of vessel collisions is dependent upon vessel speed, animal behaviour and vessel manoeuvrability, therefore, vessels travelling at slower speeds in general can allow time for seals and vessel operators to react to avoid collisions. The SPP will be adhered to during operation. This includes limits on vessel speed. Chapter 5 (Section 5.6.8.2) of the EIAR concluded that impacts on harbour seals from vessel movements during the operation phase is of negligible sensitivity.

Vessel movement protocols secured via adherence to the Vessel Management Plan, as outlined in Table 7-1 would further mitigate risk of vessel collision to harbour seals.

Overall, the risk of injury or disturbance from vessels is considered minimal, and any effects are expected to be highly localised. The introduction of Project vessels during construction and operation is not considered to be a substantive increase to baseline vessel movements. As such, when considering the proposed mitigation

measures, it can be concluded that the predicted impacts on the Annex II marine mammal qualifying feature of the Sanday SAC from the Project alone would **not adversely affect the integrity of the site**.

9.3.3 Assessment of Adverse Effects In-Combination

A number of plans and projects have been screened in for LSE on the harbour seal qualifying feature of Sanday SAC:

- Ayre Offshore Wind Farm;
- Westray Tidal Array (Orbital);
- Fall of Warness Tidal Test Site (European Marine Energy Centre; EMEC);
- Billia Croo Wave Test Site (EMEC);
- Mocean Deerness Wave Energy;
- SHEPD North Coast and Orkney regional cable surveys;
- Backaland Pier redevelopment, Eday;
- Scammalin Bay pier, Faray;
- Hatston Pier Expansion;
- Stronsay Harbour dredging;
- Hatston dredging; and
- Scammalin Bay (Faray) dredging.

9.3.3.1 Offshore wind developments

Ayre offshore wind farm lies within the 50 km foraging range of harbour seals from Sanday SAC, although harbour seals in Orkney are known to have a predominantly coastal distribution. However, some impacts from offshore wind farm construction (e.g. noise) can extend significantly beyond the footprint of the development, and Ayre wind farm has LSE on the harbour seal feature of Sanday SAC.

The Ayre wind farm Report to Inform an Appropriate Assessment (RIAA) reported that the risk of auditory injury of Sanday SAC harbour seals could be fully mitigated, and that on any given day of piling up to 81 harbour seals (2.79% of the North Coast and Orkney population) could be disturbed, and <1 harbour seal would experience disturbance from geophysical surveys, or temporary threshold shift (TTS) per day of unexploded ordnance (UXO) clearance. Although underwater sound sources may cause temporary behavioural disturbance to a number of individual seals, these effects are expected to be localised, short-term and not significant at the population level, which was demonstrated through population modelling. It was concluded that there is no risk of an adverse effect on the harbour seal feature of Sanday SAC.

9.3.3.2 Pier and harbour developments

There are three marine licences (and marine licence applications) for port construction works, i.e. Backaland Pier, Scammalin Bay and Hatston Pier Expansion which have LSE on the harbour seal feature of Sanday SAC. Port and harbour development can have adverse impacts on harbour seals, largely through the emission of high-amplitude impulsive sound during construction works. Although underwater sound sources may cause auditory injury or behavioural disturbance to a number of individual seals, these effects are expected to be localised and short-term, only for the duration of construction; and, in the case of injury, are highly unlikely given the high threshold for permanent threshold shift (PTS) in phocid seals. Individual harbour seals are considered to be resilient to short-term behavioural disturbance, and therefore any impacts would not be significant at the population level, as harbour seals are capable of avoiding (moving away from) disturbing sound sources to forage elsewhere.

9.3.3.3 Dredging operations

There are three marine licences (and applications) for dredging operations, i.e. Stronsay harbour, Hatston pier and Scammalin Bay which have LSE on the harbour seal feature of Sanday SAC. Dredging operations can have adverse impacts on harbour seals, largely through the emission of non-impulsive sound during dredging and disposal. Although underwater sound sources may cause behavioural disturbance to a number of individual

seals, auditory injury is not a plausible pathway. Disturbance effects are expected to be localised and short-term, only for the duration of the dredging campaign. Individual harbour seals are considered to be resilient to short-term behavioural disturbance due to dredging works, and therefore any impacts would not be significant at the population level, as harbour seals are capable of avoiding (moving away from) disturbing sound sources to forage elsewhere.

9.3.3.4 Geophysical surveys

There is one five-year regional plan for SHEPD cable (and cable route) surveys around the North Coast and Orkney region which has LSE on the harbour seal feature of Sanday SAC. This activity has been assessed for its impacts on European Protected Species (EPS; i.e., cetacean and otter) and impacts on protected sites, including Sanday SAC. The pathway to impact would be disturbance from geophysical survey equipment, particularly the use of sub-bottom profilers. Due to the short duration of each individual cable route survey, and the likely cumulative duration of all cable route surveys for the five-year period, the assessment concluded that there would be no adverse effect on the harbour seal feature of Sanday SAC.

9.3.3.5 Wave and tidal energy developments

There are four marine renewable energy developments with LSE on the harbour seal feature of Sanday SAC: Fall of Warness tidal test site, Westray Tidal Array, Bilia Croo wave test site, and the Deerness wave energy site. Although there is no clear pathway to adversely impact on harbour seals from these wave energy developments, the recent section 36 variation application for an expansion of the Fall of Warness tidal test site is notable due to its presented conclusions of adverse effects on site integrity for the harbour seal feature of Sanday SAC. Although the applicant argued that the impacts to Sanday SAC will be relatively small (and are based around a collision risk assessment approach with known limitations) the HRA for the Fall of Warness development included a derogation case for Sanday SAC, with a proposal to compensate for collision impacts at the tidal test site.

The Fall of Warness consent variation has not yet been approved, but it is understood that it will only be consented if an appropriate compensation plan can be agreed with the regulator and advisers. The same is true for Westray Tidal Array, which is intending to submit a section 36 consent application in late 2026: should that project be consented, then given the potential for additional collision risk to harbour seals from Sanday SAC, compensation will be required.

As a result, it is concluded that unless further evidence becomes available which reduces the predicted risk of collision from tidal turbines, both these tidal developments will require derogation from the Habitats Regulations, including the provision of compensatory measures, then their residual impacts will be reduced to zero when considered in combination with the Project.

9.3.3.6 Vessel disturbance

The screened-in projects (Table 9-2) have the potential to generate vessel traffic during both their construction and operational project phases. Such vessel activity may contribute to disturbance of harbour seals through increased underwater noise, visual presence, and potentially increases the risk of collision. Potential vessel-related effects have, therefore, been considered across all screened-in projects. However, vessel movements associated with these developments are generally expected to utilise established navigation routes, be temporary and intermittent in nature, and occur within an area where harbour seals are already regularly exposed to vessel activity associated with commercial shipping, ferry services, port operations and the oil industry. Furthermore, the plans and projects that have been considered are currently all at different stages of development, ranging from scoping and application through to consented projects. It is therefore unlikely that all construction and operational activities will occur concurrently. Given the limited magnitude of the increase in vessel traffic associated with the Project, the intermittent and temporary nature of vessel activity associated with the other screened-in developments, and the availability of extensive alternative habitat throughout Orkney waters, any cumulative disturbance effects would be temporary, spatially restricted and reversible. Furthermore, adherence to project-specific Vessel Management Plans and associated mitigation measures, including speed restrictions and wildlife-sensitive vessel operation protocols, would further reduce the potential for disturbance and vessel collision risk.

Therefore, when considered in-combination with other relevant plans and projects, construction and operational vessel disturbance is not predicted to undermine the conservation objectives of the Sanday SAC harbour seal

qualifying feature. It can be concluded that there would be **no adverse effect on the integrity** of the Sanday SAC as a result of in-combination construction and operational vessel disturbance.

9.3.3.7 In-combination summary

Given the minor cumulative effects on Sanday SAC harbour seals resulting from the Project, in combination with offshore wind developments, pier and harbour developments, dredging operations and geophysical surveys, it is concluded that there will be no adverse effects on site integrity as a result of the Project in combination with these plans and projects.

Furthermore, as any future consented tidal energy developments will be required to compensate for impacts on harbour seals (resulting from the risk of collision with tidal turbines), the impacts of these projects will be compensated for (and therefore reduced to nil) from the perspective of the in-combination assessment of adverse effects.

9.3.4 Summary

It has been determined that impacts both from the Project alone, and in combination with other plans and projects, will not have an adverse effect on site integrity, with respect to the harbour seal qualifying feature of Sanday SAC.

10 Ornithological Features - Information to Inform Appropriate Assessment

10.1 Introduction

This section provides an assessment of the potential for the Project to result in an AEoSI on SPAs designated for the conservation of ornithological qualifying features. An assessment of the potential for the Project to result in an AEoSI is provided for the Project-alone and in combination with other projects, plans and activities.

10.1.1 Screening Outcome

The European sites, qualifying ornithological features and relevant impact pathway where LSE could not be excluded as part of the LSE Screening process are summarised in Table 10-1 below.

Table 10-1 Qualifying features and associated European sites screened in for potential LSE

Site name	Qualifying interest / features	Project phase	Impact pathways screened in for potential LSE
Scapa Flow SPA	• Great northern diver, non-breeding; • Long-tailed duck, non-breeding; • Red-breasted merganser, non-breeding; • Red-throated diver, breeding; • Shag, non-breeding; • Slavonian grebe, non-breeding; • Black-throated Diver, non-breeding; and • Eider, non-breeding.	Construction	Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).
			Disturbance to prey species and habitats of prey species.
			Accidental release of contaminants or pollutants.
		Operation & maintenance	Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).
			Accidental release of contaminants or pollutants.
			Ornithological habitat changes including potential alterations to foraging abilities.
North Orkney SPA	• Great northern diver, non-breeding; • Red-throated diver, breeding; • Slavonian grebe, non-breeding.	Construction	Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).
			Disturbance to prey species and habitats of prey species.
			Accidental release of contaminants or pollutants.

Site name	Qualifying interest / features	Project phase	Impact pathways screened in for potential LSE
		Operation & maintenance	Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).
			Accidental release of contaminants or pollutants.
			Ornithological habitat changes including potential alterations to foraging abilities.
Orkney Mainland Moors SPA	• Red-throated diver, breeding.	Construction	Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).
			Disturbance to prey species and habitats of prey species.
			Accidental release of contaminants or pollutants.
		Operation & maintenance	Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).
			Accidental release of contaminants or pollutants.
			Ornithological habitat changes including potential alterations to foraging abilities.
Hoy SPA	• Arctic skua, breeding; • Fulmar, breeding; • Great black-backed gull, breeding; • Great skua, breeding; • Guillemot, breeding; • Kittiwake, breeding; • Puffin, breeding; • Red-throated diver, breeding; and • Seabird assemblage, breeding.	Construction	Disturbance of birds due to construction activities (via dredging activities, vessel presence, onshore vehicle movement, terrestrial blasting).
			Disturbance to prey species and habitats of prey species.
			Accidental release of contaminants or pollutants.
		Operation & maintenance	Disturbance and displacement of ornithology receptors from the Project (vessel presence, onshore vehicle movement, and use of mobile cranes on the quayside).
			Accidental release of contaminants or pollutants.
			Ornithological habitat changes including potential alterations to foraging abilities.

10.2 Assessment Approach

10.2.1 Summary of Occurrence of Qualifying Species at the Project Site and the wider Scapa Flow area

The Project site is regularly used by 14 breeding and non-breeding bird species, all of which are qualifying features of overlapping/nearby SPAs, which are part of populations that range over extensive areas of marine and coastal habitat.

Baseline surveys were undertaken between November 2020 and March 2024, details of which can be found in the Ornithological Technical Report (EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report; EnviroCentre, 2023). This Section utilises the findings from the baseline survey campaign to present the baseline activity and usage of the Project site by qualifying species screened in to this Information to Inform Appropriate Assessment.

10.2.1.1 Great northern diver (non-breeding)

10.2.1.1.1 Seasonality

The regular distribution of survey days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peak counts (up to 2 km from the main Vantage Point (VP)) in November and again in May
- 2021/22 peak counts (up to 2 km from the main VP) in November and again in April/May
- 2023/24 peak counts (up to 2 km from the main VP) in November and again in March

10.2.1.1.2 Wider occurrence across Scapa Flow SPA

The Scapa Flow inshore survey in 2017/18 (Jackson, 2018) found a peak of 1,016 birds, with a mean count of 826 birds across the four rounds of surveys. These counts are significantly higher than the SPA citation population (505 birds). Based on the maps and tables from each count provided in the 2017/18 survey report, great northern divers were spread out across Scapa Flow, with the exception of the "Southern Approaches" vantage points. The HiDef survey results from 2021/22 and 2022/23 estimate the population within Scapa Flow to be 1,072 (range 884-1,232) using Bayesian modelling for January 2023 (Peters-Grundy *et al.,* 2026). This, along with the findings in 2017/18 (Jackson, 2018) highlights that recent survey data indicate a significantly (ca. 200%) larger wintering population within Scapa Flow SPA than in the citation when the SPA was designated in 2022 (JNCC, 2022). Nevertheless, the citation population is carried through as the basis of this assessment.

The surveys also indicate that the largest numbers of great northern divers within the eastern half of Scapa Flow occur off the Tongue of Westerbister and in St Mary's Bay, located 2.5-4 km south of the Project site. A map showing the distribution of birds recorded both during the baseline surveys and HiDef surveys from 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026), as well as maps showing the current baseline vessel routes and the 2017/18 wintering bird data, can be found in Appendix A: Heat Maps and HiDef Survey Data.

10.2.1.1.3 Numbers from Project survey work

Table 10-11 below indicates the peak and average counts within various distance bands around the main VP at the Project in each recording year.

Table 10-2: Peak and average numbers of great northern diver in zones around the main Project VP (NB different start dates in calculation of averages due to survey timing differences between years).

Distance band	Survey period	Peak month	Peak count	Average of peak count	% SPA population (505 birds)	Average number Oct/Nov to Mar (average peak)	% SPA population (505 birds)
0 – 500 m	Yr 1 - 2020/21	April	8	7.67	1.6%	2.036	0.4 %
	Yr 2 - 2021/22	March	9		1.8%	2.156	0.4 %
	Yr 3 - 2023/24	Nov	6		1.2%	2.125	0.4 %
0 – 1 km	Yr 1 - 2020/21	Nov/Feb	27	25	5.3%	8.608	1.7 %
	Yr 2 - 2021/22	Dec	27		5.3%	7.063	1.4 %
	Yr 3 - 2023/24	Nov	21		4.2%	8.875	1.8 %
0 – 2 km	Yr 1 - 2020/21	May	40	45.67	5.9%	15.429	3.1%
	Yr 2 - 2021/22	Jan	38		7.5%	16.031	3.2 %
	Yr 3 - 2023/24	Nov	59		12 %	24.167	4.8 %

A peak count of 27 great northern divers was recorded within 1 km of the Project site, with a peak count of 59 birds within 2 km. The 2020/21 and 2021/22 baseline data correlates well with the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 28 birds were recorded in the same general area in January 2022. There was a notably higher peak count during the 2023/24 surveys within 2 km; but within 500 m and 1 km; the 2023/24 count was lower than the other two years. The peak count of 59 birds represents 12% of the Scapa Flow SPA population, with the average peak representing 4.8% of the SPA citation population. The average seasonal peak count of 46 birds represents 9% of the SPA population (citation level).

Table 10-12 below details the numbers of great northern divers present within 2 km of the Project site during their flightless moult period (February to mid-April).

Table 10-3: Great northern diver numbers during the flightless moult period

Month	No. count days	Average count <2 km	Peak count <2 km
Feb 2021	4	6.5	16
March 2021	4	9	12
April 2021	2	24	26
2021 seasonal figures	10	11	26
Feb 2022	4	17.25 [25.5]*	24 [35]
March 2022	4	22 [27.25]	30 [51]
April 2022	2	35 [36]	38 [40]
2022 seasonal figures	10	22.7 [28.3]	38 [51]
Feb 2024	4	20.5 [23]	26 [29]
March 2024	4	26.5 [28]	35 [35]
2024 seasonal figures	8	23.5 [24.25]	35 [35]

* figures in square brackets include all diver sp.

The peak average count of 35 birds (April 2022) and peak count of 38 (April 2022) within 2 km of the Project site represents 7% and 7.5% of the SPA population (citation level), respectively. Taken as an average across years, the average of 19 birds (taken from 2021, 2022 and 2024 seasonal figures) represents 3.8% of the SPA population (citation level), and the average seasonal peak count during the flightless moult period of 33 birds represents 6.5% of the SPA population (citation level).

Based on more recent (higher) population counts for great northern diver in Scapa Flow, the percentages would be 7% for peak counts and 4.5% for peak counts during the flightless moult period (from the 2017/18 counts) and 5.5% and 3.5% respectively for the HiDef survey population estimates. It is considered that these counts are a more accurate reflection of current population levels.

10.2.1.2 Red-throated diver (breeding)

The results of the 2006 national diver survey are published in Bird Study (Dillon *et al.,* 2009). This paper includes a map with the presence of breeding and non-breeding red-throated divers mapped at a scale of 5-km squares across Orkney.

The general distribution of divers in Orkney is quite stable, given that it is dependent on the presence of suitable breeding waters – no material change is likely since 2006.

The breeding divers comprising the Scapa Flow SPA foraging population are likely to originate from one of the following breeding areas:

- Hoy – on the western side of Scapa Flow, with 58 pairs stated in the SPA citation population (NatureScot, 2009).
- Fara – one pair on the western side of Scapa Flow, not in the Hoy SPA (it is beyond 10 km to the west of the Project).
- West Mainland – usually more than 20 pairs, the bulk of which are on the northern part of the Orkney Mainland Moors SPA and most likely to utilise the North Orkney SPA for foraging. There are no known Orkney Mainland Moors SPA breeding sites within 14 km of the Project site (i.e. beyond the foraging range for the species, per Woodward *et al.*, 2019) and very few foraging trips from there would be expected towards Scapa Flow. There are also several West Mainland sites that are not in the Orkney Mainland Moors SPA – up to four pairs set back a little from the north Scapa Flow shoreline and one or two pairs much more distantly from the Project close to the larger lochs of Harray, Hundland and Swannay.
- East Mainland – ca. five pairs in two locations; only the closest birds in Holm are likely to utilise Scapa Flow SPA, and for these Scapa Flow is likely to be important based on observations of birds during the Project VP watches.

Woodward *et al,* (2019) state that the foraging distance from the nest site for breeding red-throated divers is 9 km. However, a more precautionary estimate of 10 km was used to inform this assessment.

From examination of the 1:25,000 Ordnance Survey maps and personal observations (pers. comm. Andrew Upton), it is possible to deduce the number and location of breeding pairs within 10 km of the Project.

The Project 5-km square, and all the squares to the south of it, held no breeding divers in 2006. The Loch of Tankerness (not an identified breeding site in 2006) is ca. 8 km to the northeast and is not particularly suitable for breeding red-throated divers, being surrounded by intensively managed grass fields with only small areas of natural vegetation.

There are two breeding locations within 8 km and one more at 8–10 km distance. The closest birds are inland from the Project and known to fly down to Scapa Bay regularly during the breeding season, where they loaf and forage, before often moving on into Scapa Flow. The Griffyelt and Loch of Kirbister birds are within foraging distance of the Project but have a very large area of suitable foraging much closer to them; the majority of flight paths at the Project in 2022 could be related to the inland pairs there.

The red-throated divers on Hoy, Fara, a small number on the West Mainland pairs (facing Scapa Flow), and a few pairs on East Mainland together comprise the total breeding population likely to utilise the Scapa Flow SPA for feeding. This totals approximately 70 pairs, the great majority of which are concentrated within the Hoy SPA, well to the west and beyond any realistic potential for significant interaction with the Project site.

The closest diver-supporting parts of the Orkney Mainland Moors SPA lie at about 15 km northwest of the Project, half of which is overland. Since there is plenty of good foraging ground much closer to these breeding lochans in the North Orkney SPA, there is little possibility of a regular or significant connection between the Orkney Mainland Moors SPA and the Project site.

The Marine Directorate website shows a map (NatureScot, 2014a) of the predicted foraging occurrence of red-throated divers across the North Orkney and Scapa Flow SPAs. It indicates that the Project is in the lowest category of modelled diver foraging.

10.2.1.2.1 Numbers from Project survey work

Table 10-4 below indicates the peak and average counts within various distance bands around the main VP at the Project in each recording year.

Table 10-4 Peak and average numbers of red-throated diver in zones around the main Project VP (NB different start dates in calculation of averages due to survey timing differences between years).

Distance band	Survey period	Peak month	Peak count	Average of peak count	% SPA population (76 birds)	Average count	% SPA population (76 birds)
Non-breeding							
0 – 1 km	Yr 1 - 2020/21	Nov-Mar	2	1.67	N/A	0.12	N/A
	Yr 2 - 2021/22	Oct-Mar	2			0.12	
	Yr 3 - 2023/24	Oct-Mar	1			0.18	
0 – 2 km	Yr 1 - 2020/21	Oct-Mar	0	0.67		0	
	Yr 2 - 2021/22	Oct-Mar	1			0.021	
	Yr 3 - 2023/24	Oct-Mar	1			0.09	
Breeding							
0 – 1 km	Yr 1 - 2020/21	Apr-Sept	4	3	5.3%	0.32	0.4%
	Yr 2 - 2021/22	Apr-Sept	2		2.6%	0.33	0.4%
0 – 2 km	Yr 1 - 2020/21	Apr-Sept	0	1	0%	0	0%
	Yr 2 - 2021/22	Apr-Sept	2		2.6%	0.125	1.6%

A peak count of 4 red-throated divers was recorded within 1 km of the Project site during the breeding season, with a peak count of 2 birds within 2 km. The peak count of 4 birds represents 5.3% of the Scapa Flow SPA population, and the average seasonal peak count of 3 birds out to 2 km represents 3.9% of the SPA population (citation level).

Table 10-5 below details the numbers of red-throated divers present within 2 km of the Project site during their flightless moult period (mid-September to mid-October, per Duckworth *et al*, 2024).

Table 10-5 Red-throated diver numbers during the flightless moult period

Month	No. count days	Average count 2 km	Peak count <2 km
Sept 2021	3	1.33	2
Oct 2021	3	0.67	1
2021 seasonal figures	6	1	2
Sept 2022	3	1	2

The peak average count of 1.33 birds (September 2023) and peak count of 2 (September 2021 and 2022) represents 1.75% and 2.6% of the SPA population, respectively. The average peak count during the flightless moult of 2 birds (2021 seasonal figures and September 2022) represents 2.6% of the SPA population.

10.2.1.3 Black-throated diver (non-breeding)

10.2.1.3.1 Seasonality

The spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (within 1km of the main VP) in November and again in February/March.
- 2021/22 peaks (within 1km) in October and again in December/January, but overall peaking within 2 km in January.
- 2023/24 peaks (within 1km) in November and January, but overall peaking within 2 km in late October/November.

The SPA citation population of this species is 57 birds (JNCC, 2022).

10.2.1.3.2 Wider occurrence across Scapa Flow SPA

The Scapa Flow inshore survey in 2017/18 (Jackson, 2018) observed a total of 39 black-throated divers during a dedicated search for the species in February (the third of four count rounds). Based on the maps and tables from each count provided in the 2017/18 survey report (Jackson, 2018), the key area for black-throated divers was along the central north shore of the Flow between Bay of Swanbister and Hobbister, three or more kilometres to the west of the Project site. All the divers were seen in that area during the second count, while a group of three birds was in the Project vicinity on each of the first and third counts, and most were scattered at the far, western, side of the Flow in the fourth (last) count round in March.

HiDef surveys undertaken in 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026) indicate that the majority of black-throated divers were recorded off the Tongue of Gangsta, approximately 1 km south of the Project site and in St Mary's Bay, 4 km south in 2021/22 and in Scapa Bay and off Hemp Stack, to the north of the Project site and off Tongue of Westbister, approximately 2.5km south in 2022/23 (Peters-Grundy *et al.,* 2026). This demonstrates the transient nature of this species within Scapa Flow throughout the winter season.

On 13 December 2023 a tight group of 11 was seen fishing in Mill Bay, Hoy at the far side of the Flow from the Project (Andrew Upton personal observation), then on 26th December 2023 a tight group of 25 actively foraging divers, almost certainly black-throated, was seen from the Project in calm conditions at the mouth of Waulkmill Bay some 5 km to the west (from the upper and north VPs, beyond the spreadsheet recording zones). This larger group was probably comprised mainly of the same individuals as seen the previous month, much closer to the Project, whilst the smaller group may have represented additional birds. If so, this suggests an SPA minimum total of around 36 black-throated divers in 2023/24, in the same two general areas where most were found during the first and third count rounds in 2017/18, thus possibly forming the bulk of the SPA population.

A map showing the distribution of birds recorded both during the baseline surveys and HiDef surveys from 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026) can be found in Appendix A: Heat Maps and HiDef Survey Data.

Figure 10-1 below shows the distribution of black-throated diver across Scapa Flow, as illustrated by data from the NatureScot (2014b) available on NMPI (2026). Although it shows the area around the Project site to be a regularly used area, it also shows several other areas across Scapa Flow that the species frequents.

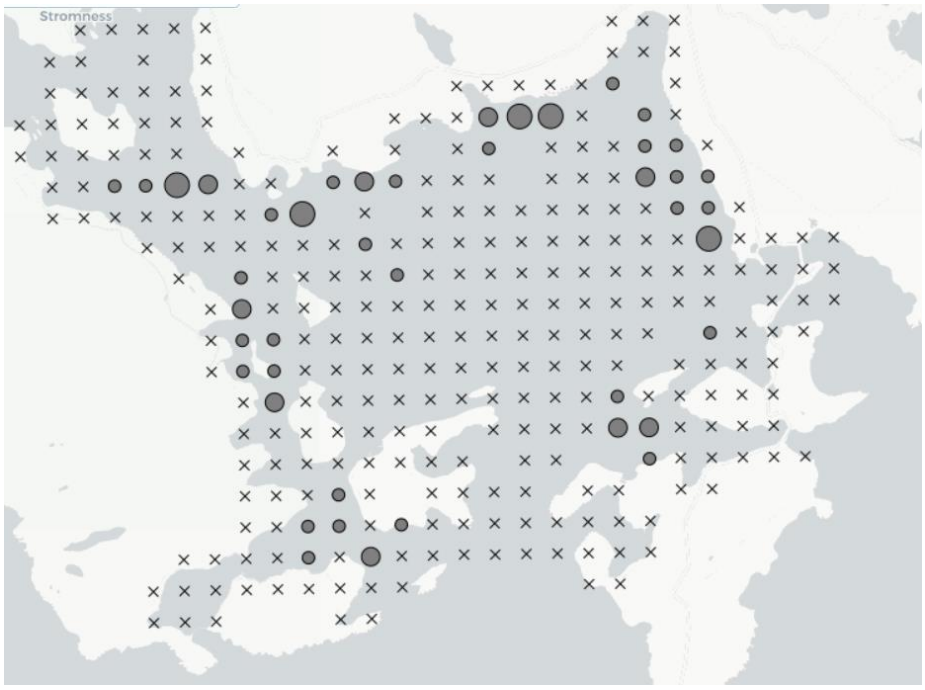


Figure 10-1 Site Usage of Black-throated Diver in Scapa Flow SPA (NatureScot, 2014b)

10.2.1.3.3 Numbers from Project survey work

Table 10-6 below indicates the peak and average counts within various distance bands around the main VP at the Project in each recording year.

Table 10-6: Peak and average numbers of black-throated diver in zones around the main Project VP (NB different start dates in calculation of averages due to survey timing differences between years).

Distance band	Survey period	Peak month	Peak count	Average of peak count	% SPA population (57 birds)	Average number Oct/Nov to Mar (Average peak)	% SPA population (57 birds)
0 – 500 m	Yr 1 - 2020/21	Nov	7	8.33	12%	0.70	1.2 %
	Yr 2 - 2021/22	Oct	7		12 %	0.46	0.8 %
	Yr 3 - 2023/24	Nov	11		19 %	0.64	1.1 %
0 – 1 km	Yr 1 - 2020/21	Nov/Feb	7	9.33	12%	2.15	3.8 %
	Yr 2 - 2021/22	Dec	10		17 %	1.33	2.3 %
	Yr 3 - 2023/24	Nov	11		19 %	1.55	2.7 %
0 – 2 km	Yr 1 - 2020/21	n/c	-	19	-	-	-
	Yr 2 - 2021/22	Jan	11		19 %	3.00	5.3 %
	Yr 3 - 2023/24	Nov	27		47 %	6.23	11.0 %

The 2021/22 peak of 11 birds within 2 km in January 2022 correlates well with the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 14 birds was recorded in the same general area in the same month.

The numbers present at or near the Project in the 2023/24 winter were higher than previously, particularly in the autumn, when four out of five days at the end of October through November held double figures within 2 km of the main VP (19 on 31st October; 20 on 7th November, and 27 on 19th November 2023). It should be noted that these numbers should be considered outliers, as this three-week period is the only time over 3 years of surveys where numbers reached such levels. This coincides with increased numbers of great northern diver during the same period (peak of 59 birds on 19th November 2023). Reasons for this notable increase in both diver species are uncertain; however this could speculatively indicate a reliable availability of food in this area over this limited period, that birds were using this area for shelter during certain weather conditions, or possibly that birds had been displaced from other regions and were aggregating close to the proposed development.

Based on the Scapa Flow SPA population of 57 birds, the peak of 11 birds in the first two survey years represents 19% of the total numbers, with the peak of 14 birds during the HiDef surveys in 2022 (Peters-Grundy *et al.,* 2026) representing 24.6%. Assuming the same SPA population, then up to 47% of birds were within 2 km of the main VP at times for a month in the autumn of 2023. The average of the seasonal peak count out to 2 km is 15 birds (taking the peak count for the 0-1km due to data availability), representing 26% of the SPA population.

The average number of birds present within 500 m of the main VP was less than 2% of the SPA numbers in all three years, rising to 3.8% within 1 km (2020/21) and up to 11% within 2 km (2023/24).

Table 10-20 below details the numbers of black-throated divers present within 2 km of the Project site during their flightless moult period (mid-September to the end of December).

Table 10-7: Black-throated diver numbers during the flightless moult period

Month	No. count days	Average count 0-1km	Peak count 0-1km	Average count 2 km	Peak count <2 km
Nov 2020	4	4.25	7	4.25	7
Dec 2020	4	0.75	2	2.25	6
2020 seasonal figures	8	2.5	7	3.25	7
Sept 2021	2	1	2	1	2
Oct 2021	4	3	7	3	7
Nov 2021	4	0	0	0	0
Dec 2021	4	3	10	3.5	10
2021 seasonal figures	14	1.9	10	1.9	10
Oct 2023	2	7	11	9.5	19
Nov 2023	4	0.5	1	16.5	28
Dec 2023	4	1.25	3	3.25	11
2023 seasonal figures	10	2.1	11	9.8	28

The peak average count of 16.5 birds (November 2023) and peak count of 28 (November 2023) during the flightless moult period represents 29% and 49% of the SPA population, respectively. Taken as an average across years, the average of 5.02 birds (taken from 2020, 2021 and 2023 seasonal figures) represents 8.8% of the SPA population, and the average peak count during the flightless moult of 15 birds represents 26% of the SPA population. Note that this identifies the percentage of the population occurring close to the Proposed Development during this particularly sensitive period of the species' life history, but not for the full non-breeding period when birds may be present.

10.2.1.3.4 Features of observed distribution around the Project

As can be seen in

Table 10-2 and as illustrated in the bar charts and the density heat maps (Appendix A: Heat Maps and HiDef Survey Data), single figures of birds were recorded within the 500 m radius around the main VP (the effective disturbance zone) in the first two survey years, with up to 11 in November 2023, these swimming steadily through the area as a group and away to the northwest.

The heat maps for the first two years indicate a rather uniform likelihood of occurrence within the 1 km radius, and a slightly lower density at 1–2 km in the second year. However, the monthly bar charts indicate a considerably higher proportion of birds at 1–2 km in the third year (2023/24).

10.2.1.3.5 Observed behaviours around the Project

The swimming track observations from the first two survey years show that black-throated divers can move rapidly, especially when foraging in groups. This was also noted in 2023/24, although detailed swimming track maps were not made, and was commented on in the report for the 2017/18 pSPA survey (Jackson, 2018) when birds were noted moving several kilometres in a few hours.

The swimming track samples recorded the behaviour of individuals or groups of birds at approximately five-minute intervals; the results were variable between years for black-throated diver, with 33 % of bird-records noted as foraging in 2020/21 (from nearly 14 hours) and 66 % in 2021/22 (from nearly 27 hours).

This species undergoes wing-moult for several weeks during the winter when the birds are rendered flightless and can only move around by swimming or diving.

10.2.1.3.6 Observed reactions to vessels at the Project and Hatston

The combined table of observed reactions (referenced in EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report) to vessels at the Project and Hatston sites includes black-throated diver. During the ornithological surveys undertaken, bird and boat interactions were recorded..For black-throated diver, there were ten observations of interactions with boats. Of these, five resulted in birds swimming away slowly, two were of birds diving, one caused an alert response, and two resulted in no apparent response. There were no instances of boat movements causing a flight response.

This notion is supported by survey data recorded in Haston Pier Ornithological Technical Report (EnviroCentre, 2024b). Although recorded only in low numbers, black-throated diver was observed on three occasions within the Hatston survey area during a 2022/23 survey campaign, including sightings from both the north and south pier vantage points adjacent to the operational harbour, indicating that the species is present within and utilises areas subject to existing harbour activities and vessel movements.

This aligns with the findings of Jarrett *et al.* (2021) where 21 observations of black-throated divers from ferries in Scapa Flow (in 2016/17) also recorded no flight responses. In that study, one third of individuals/groups within 300 m of a ferry did not respond at all, another quarter (approximately) swam out of the way, and the rest dived. All birds within 100 m of the ferry track exhibited a response, with fewer responding birds at 100–300 m. Overall, however, there were too few records for this difference to be statistically significant.

A recent paper (O'Hanlon *et al.*, 2024) following tagged kittiwakes off Aberdeenshire highlighted a wide range of individual differences in foraging and habitat selection, which are hidden when averaged across individuals to give a population response. Thus, an averaged response will underestimate some individuals and overestimate others, potentially leading to unforeseen impacts on population dynamics. Whilst the authors' concern was the underestimation of some individuals' response, in the present case, an assumption of responses towards the maximum recorded clearly does not account for the many birds that do not exhibit such a great response, as indicated by the data collected at the Project and Hatston. Ad hoc observations also show that some individuals appear unmoved by vessels in their close vicinity e.g. a black-throated diver inside Scrabster Harbour that merely continued to forage within 100 m while the Motor Vessel (MV) *Hamnavoe* ferry arrived and tied up (Andrew Upton personal observation, 18th Dec 2021).

10.2.1.4 Long tailed duck (non-breeding)

10.2.1.4.1 Seasonality

The spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (up to 2 km from the main VP) in May

- 2021/22 peaks (up to 2 km from the main VP) in March
- 2023/24 peaks (up to 2 km from the main VP) in March

The SPA citation population of this species is 505 birds (JNCC, 2022).

10.2.1.4.2 Wider occurrence across Scapa Flow

During inshore surveys undertaken in 2017/18 (Jackson, 2018), long-tailed duck were distributed all around the coast of the SPA, apart from the 'Southern Approaches' sectors where they were scarce. Particularly large numbers were present along the east coast of Hoy, where they were commonly found in relatively large numbers around fish farms. The east coast of Hoy, between Ore Bay and Burra Sound, accounted for 39% of the total recorded long-tailed duck.

A map showing the distribution of birds recorded both during the baseline surveys and HiDef surveys from 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026) can be found in Appendix A: Heat Maps and HiDef Survey Data.

10.2.1.4.3 Numbers from Project survey work

During the vantage point surveys undertaken, a peak count of 655 birds were recorded in March 2024. This correlates with previous survey findings, with peak counts of 414 and 232 around the Westerbister finfish farm in May 2021 and March 2022, respectively. During the spring, this species forms larger, concentrated flocks prior to migration.

As can be seen in the density heat maps produced in Appendix A: Heat Maps and HiDef Survey Data, small numbers of long-tailed duck were recorded within the Project site footprint (mainly between 1 and 3, but with a peak of 10 birds). The majority of birds were recorded to the south, in the vicinity of the fish farm cages.

Table 10-8 below details the numbers of long-tailed duck present within 2 km of the Project site during their pre-migration congregation period (March to mid-May).

Table 10-8: Long-tailed duck numbers during the pre-migration congregation period

Month	No. count days	Average count <2 km	Peak count <2 km
March 2021	4	35	60
April 2021	4	134	176
May 2021	2	310	414
2021 seasonal figures	10	130	414
March 2022	4	73	234
April 2022	4	42	75
May 2022	1	58	58
2022 seasonal figures	9	58	234
March 2024	4	374	515

The peak average count of 374 birds (March 2024) and peak count of 515 (March 2024) during the pre-migration congregation period represents 26.8% and 37% of the SPA population, respectively. Taken as an average across years, the average of 187.3 birds (taken from 2021, 2022 and 2024 seasonal figures) represents 13.4% of the SPA population, and the average peak count of 387.6 birds represents 27.8% of the SPA population. Note that this identifies the percentage of the population occurring close to the Proposed Development during the pre-migration congregation period, but not for the full non-breeding period when birds may be present.

10.2.1.5 Eider (non-breeding)

10.2.1.5.1 Seasonality

The spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (up to 2 km from the main VP) in August

- 2021/22 peaks (up to 2 km from the main VP) in August
- 2023/24 peaks (up to 2 km from the main VP) in November

The SPA citation population of this species is 1,997 birds (JNCC, 2022).

10.2.1.5.2 Wider occurrence across Scapa Flow

During inshore surveys undertaken in 2017/18 (Jackson, 2018), eider were distributed all around the coast of the SPA, apart from the 'Southern Approaches' sectors where they were scarce. Particularly large numbers were present along the east coast of Hoy, where they were commonly found in relatively large numbers around fish farms. The east coast of Hoy, between Ore Bay and Burra Sound, accounted for 55% of the total recorded eider.

A map showing the distribution of birds recorded both during the baseline surveys and HiDef surveys from 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026) can be found in Appendix A: Heat Maps and HiDef Survey Data.

10.2.1.5.3 Numbers from Project survey work

During the vantage point surveys between 2020/21 and 2023/24, a peak count of 104 eider were recorded within 2 km of the Project site. This is higher than the counts from the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 30 birds were recorded in the same general area in January 2022. The peak counts for 2020/21 and 2021/22 occurred in August, when eider are moulting and form large flightless flocks. The peak of 104 birds represents 5.2% of the SPA population.

As can be seen in the density heat maps provided in EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report, a large proportion of the birds were recorded within the Project site footprint area, feeding and loafing close inshore.

Table 10-9 below details the numbers of eider present within 2 km of the Project site during their flightless moult period (July to mid-September).

Table 10-9: Eider numbers during their flightless moult period

Month	No. count days	Average count <2 km	Peak count <2 km
July 2021	4	1.25	3
August 2021	4	51.75	93
September 2021	2	51	71
2021 seasonal figures	10	31.4	93
July 2022	4	72	80
August 2022	4	64.75	91
September 2022	2	50.5	57
2022 seasonal figures	10	64.8	91

The peak average count of 64.75 birds (August 2022) and peak count of 93 (August 2021) during the flightless moult period represents 3.2% and 4.6% of the SPA population, respectively. Taken as an average across years, the average of 48.1 birds (taken from 2021 and 2022 seasonal figures) represents 2.4% of the SPA population, and the average peak count of 92 birds represents 4.6% of the SPA population. Note that this identifies the percentage of the population occurring close to the Proposed Development during this particularly sensitive period of the species' life history, but not for the full non-breeding period when birds may be present.

10.2.1.6 Red-breasted merganser (non-breeding)

10.2.1.6.1 Seasonality

The spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (up to 2 km from the main VP) in January to March
- 2021/22 peaks (up to 2 km from the main VP) in January
- 2023/24 peaks (up to 2 km from the main VP) in October

The SPA citation population of this species is 539 birds (JNCC, 2022).

10.2.1.6.2 Wider occurrence across Scapa Flow:

During the inshore surveys undertaken in 2017/18 (Jackson, 2018), red-breasted mergansers occurred almost exclusively along the most sheltered coastlines and typically were close inshore, in pairs or small groups. The highest numbers were recorded in North Bay at Hoy, around Burray and in Water Sound between South Ronaldsay and Burray.

10.2.1.6.3 Numbers from Project survey work

During the vantage point surveys, red-breasted merganser was very infrequently recorded, with a peak of three birds noted within 1 km and a peak of 4 birds within 2 km. This correlates well with the counts from the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 2 birds was recorded in the same general area. The average peak of 3 birds represents 0.5% of the Scapa Flow SPA population. The average seasonal peak count (1 and 3 birds within 1 km and 4 birds within 2 km) is 2.7 birds, representing 0.5% of the SPA population.

10.2.1.7 European shag (non-breeding)

10.2.1.7.1 Seasonality

The regular spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (up to 2 km from the main VP) in October
- 2021/22 peaks (up to 2 km from the main VP) in September
- 2023/24 peaks (up to 2 km from the main VP) in November

This correlates with the findings of the 2017/18 inshore surveys (Jackson, 2018), which found that Scapa Flow SPA has particular importance for this species in the early part of the winter. The SPA citation population of this species is 2,927 birds (JNCC, 2022).

10.2.1.7.2 Wider occurrence across Scapa Flow SPA

During the inshore surveys undertaken in 2017/18 (Jackson, 2018), shags on the sea were very widely distributed across the SPA, with the only part where they were infrequently seen was the central part of Scapa Flow, where presumably the seabed lies too deep for profitable foraging. The majority of shags (on average 58%) were recorded in the Scapa Flow inshore count sectors, with the 'East Coast' count sectors having particular importance for this species, accounting, on average, for nearly 12% of the birds seen. The 'Southern Approaches' count sectors also accounted, on average, for 7% of the birds seen. European shag was the only SPA qualifying species that occurred in reasonably high numbers in this part of the SPA.

10.2.1.7.3 Numbers from Project survey work

During the vantage point surveys, a peak count of 72 European shag were recorded within 1km of the Project site, with a peak of 73 birds within 2 km (Table 3 of EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report). This is higher than the counts from the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 24 birds were recorded in the same general area in January and February 2022. The peak of 73 birds represents 2.5% of the Scapa Flow SPA population. The average of the seasonal peak count (38 and 72 birds within 1 km In years 1-2, and 73 birds within 2 km in year 3) is 61 birds, representing 2.1% of the SPA population.

As can be seen in the density heat maps provided in Appendix A: Heat Maps and HiDef Survey Data, birds were recorded within the Project site footprint area, although in small numbers (usually between one and five). However, there was a peak count of 30 birds on 18th December 2022.

10.2.1.8 Slavonian grebe (non-breeding)

10.2.1.8.1 Seasonality

The spread of count days at the Project site gives a good indication of the seasonal spread of records.

- 2020/21 peaks (within 500m of the main VP) in February.
- 2021/22 peaks (within 1km) in December and again in February.
- 2023/24 peaks (within 1km) in March.

The SPA citation population of this species is 135 birds (JNCC, 2022).

10.2.1.8.2 Wider occurrence across Scapa Flow SPA

During the inshore surveys undertaken in 2017/18 (Jackson, 2018), Slavonian grebes showed a strong preference for sheltered, relatively shallow parts of the survey area with only seven birds seen in all the boat-based surveys, underlining the lack of importance of the central part of Scapa Flow. The 'East Coast' part of the SPA also had low numbers of this species, and none were recorded in the 'Southern Approaches' count sections. The largest counts were around Swanbister and Waulkmill Bay in the northern part of the SPA, and around Burray. The distribution of records in Scapa Flow showed that there was some noticeable redistribution throughout the winter. Moderate numbers were seen in Round 1 between Hoy and South Walls (but these had largely moved away in later count rounds). In contrast, relatively few birds were seen between South Ronaldsay and Burray in Round 1, but they were commonly seen here in later count rounds.

A map showing the distribution of birds recorded both during the baseline surveys and HiDef surveys from 2021/22 and 2022/23 (Peters-Grundy *et al.,* 2026) can be found in Appendix A: Heat Maps and HiDef Survey Data.

10.2.1.8.3 Numbers from Project survey work

Table 10-10 below indicates the peak and average counts within various distance bands around the main VP at the Project in each recording year.

Table 10-10: Peak and average numbers of Slavonian grebe in zones around the main Project VP (NB different start dates in calculation of averages due to survey timing differences between years).

Distance band	Survey period	Peak month	Peak count	Average of peak count	% SPA population (135 birds)	Average number Oct/Nov to Mar (average peak)	% SPA population (135 birds)
0 – 500 m	Yr 1–- 2020/21	Feb	7	5.67	5.2 %	3.45	2.5 %
	Yr 2–- 2021/22	Dec/Feb	5		3.7 %	1.85	1.4%
	Yr 3–- 2023/24	March	5		3.7%	1.125	0.8%
0 – 1 km	Yr 1–- 2020/21	Feb	7	5.67	5.2%	3.55	2.6%
	Yr 2–- 2021/22	Dec/Feb	5		3.7%	2.05	1.5 %
	Yr 3–- 2023/24	Nov	5		3.7%	1.625	1.2 %
0 – 2 km	Yr 1–- 2020/21	Feb	7	5.67	5.2%	3.55	2.6%
	Yr 2–- 2021/22	Dec/Feb	5		3.7 %	2.05	1.5 %
	Yr 3–- 2023/24	March	5		3.7 %	1.625	1.2 %

A peak count of 7 Slavonian grebes was recorded within 1km of the Project site, with a peak of 7 birds within 2 km. This is slightly higher than the counts from the inshore surveys undertaken by HiDef for NatureScot (Peters-Grundy *et al.,* 2026), where a peak count of 2 birds were recorded in the same general area in January and February 2022. The peak of 7 birds represents 5% of the Scapa Flow SPA population. The average of the seasonal peak count is 5.67 birds, representing 4.2% of the SPA population.

As can be seen in the density heat maps provided in Appendix A: Heat Maps and HiDef Survey Data, birds were recorded within the Project footprint area, although in small numbers (usually singles). However, there was a peak count of five birds on 2^{6t}h January 2022.

10.2.1.9 Arctic skua (breeding)

Small numbers were recorded flying past very infrequently during the summer months, with a peak of five birds in June 2022. The closest known breeding areas are on the East Mainland, ~10 km distance, supporting only one or a few pairs at each location. The five birds recorded represents 4.2% of the Hoy SPA citation population (59 pairs).

10.2.1.10 Atlantic puffin (breeding)

This species was recorded on 7 out of 48 watch days during 2020 and 2022, with a peak of 3 birds. It is possible that these birds are from Hoy SPA but the area in the vicinity of the proposed Project site is not considered to be of importance to this species. The peak of three birds represents 0.04% of the Hoy SPA citation population (3,500 pairs).

10.2.1.11 Black-legged kittiwake (breeding)

Small numbers were recorded flying past during the summer months, with a peak of 7/hr in June 2022. A peak count of 83 birds on the water within 2 km was also recorded. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 83 birds represents 1.4% of the Hoy SPA citation population (3,000 pairs).

10.2.1.12 Common guillemot (breeding)

Small numbers were recorded, with a peak of 27 birds within 1km of the Project site and 87 within 2 km. Small numbers were also recorded flying past the Project site, with a peak of 6/hr in June 2022. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 87 birds represents 0.3% of the Hoy SPA citation population (13,400 pairs).

10.2.1.13 Great black-backed gull (breeding)

A peak of 11 birds were recorded during the summer, and up to 7 birds per hour were recorded flying past at its peak. One pair recorded nesting close to the Project site. It is unlikely that the birds recorded were part of the Hoy SPA complex. The peak of 11 birds represents 0.96% of the Hoy SPA citation population (570 pairs).

10.2.1.14 Great skua (breeding)

Small numbers, with a peak of 4 birds/hr flying past in July 2021. Numbers in 2022 were significantly lower, probably due to the prevalence of avian flu, which has decimated the local and national populations. The 4 birds/hr represents 0.1% of the Hoy SPA citation population (1,900 pairs).

10.2.1.15 Northern fulmar (breeding)

Sizable numbers were recorded flying past during the summer months, with a peak of 56/hr in July 2022. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 56 birds/hr represents 0.08% of the Hoy SPA citation population (35,000 pairs).

10.2.2 Key Data Sources

The following sections present key data sources that inform the Information to Inform Appropriate Assessment.

10.2.2.1 Sensitivity to Disturbance

Sensitivity to vessel disturbance differs across bird species. Studies by Garthe and Hüppop (2004) and Schwemmer *et al.* (2011) suggest that divers and scoters may avoid shipping activity by several kilometres, while gulls are not considered susceptible to disturbance because of their habituation to fishing boats (e.g. Camphuysen, 1995; Hüppop and Wurm, 2000). Table 10-11 summarises the rated sensitivity of the key qualifying features of the SPAs included in this Information to Inform Appropriate Assessment, based on the data review undertaken by Furness *et al. (*2012).

NatureScot have stated in previous correspondence[9] that divers are highly sensitive to towering structures in the marine environment, and therefore, the use of cranes should be included as a pathway to impact in this assessment. There is no comparable evidence for disturbance as a result of crane movements or similar towering structures, and so the sensitivity factors for disturbance due to vessels presented in Table 10-11 below will be used as a proxy.

Table 10-11 Sensitivity to vessel disturbance of the qualifying features of the SPAs screened in to this Information to Inform Appropriate Assessment (Furness et al., 2012).

Qualifying feature	Sensitivity to disturbance and displacement
Great northern diver	High
Long-tailed duck	Low
Red-breasted merganser	Medium
Red-throated diver	Very high
Shag	Medium
Slavonian grebe	Medium (however, NatureScot advise **very high** sensitivity to boat disturbance in Orkney, based on Jarrett *et al.*, 2018)
Black-throated diver	Very high
Common eider	High
Velvet scoter	Medium
Arctic skua	Very low
Fulmar	Very low
Great-black backed gull	Low
Great skua	Very low
Guillemot	Medium
Kittiwake	Low
Puffin	Low

10.2.2.2 Foraging Ranges

Table 10-12 below outlines the breeding season foraging ranges (Woodward *et al.,* 2019) that have been used to support this Information to Inform Appropriate Assessment.

Table 10-12 Breeding seasons foraging ranges for relevant SPA qualifying seabird species (Woodward et al., 2019)

	Foraging Range (km)		
Qualifying feature	Maximum	Mean Max	Mean Max + 1 SD
Red-throated diver	9	9	9
Shag	46	13.2 ± 10.5	23.7
Common eider	22.5	21.5	21.5
Arctic skua	2.7		
Fulmar	2,736	542.3 ± 657.9	1,200.2
Great-black backed gull	73	73	73
Great skua	1003	443.3 ± 487.9	
Guillemot	338	73.2 ± 80.5	153.7

[9] NatureScot Consultation Response 7th November 2025 (Ref: CDM181903)

	Foraging Range (km)		
Kittiwake	770	156.1 ± 144.5 300.6	
Puffin	383	137.1 ± 128.3	265.4

For all non-breeding seabird qualifying features of the SPAs (great northern diver; long-tailed duck; red-breasted merganser; Slavonian grebe; black-throated diver), impacts are considered within 15 km of the SPA based on NatureScot (2023b).

10.2.2.3 Baseline vessel movements

The Project have provided information on the current typical monthly vessel movements experienced within the eastern area of Scapa Flow. This baseline is derived from the Project NRA (see Appendix 2.3 of EnviroCentre, 2025a). Baseline vessel activity in Scapa Flow is characterised by a high level of diverse maritime traffic year-round, with AIS data showing 2,884 vessel movements in August 2023 (summer) and 2,504 movements in February 2024 (winter). Vessel types include ferries, cargo vessels, fishing boats, tankers, offshore support vessels, pilot boats, tugs, and recreational craft. Extrapolation across the seasons indicates approximately 15,342 movements during the summer period (April–September) and 13,062 during winter (October–March). Within the eastern area of Scapa Flow—closest to the Project site—current typical activity amounts to 124 vessel movements per month, including fuel tankers, ship-to-ship operations, tug trips, pilot boat operations, and occasional workboats. This local flow represents only ~5% of total Scapa Flow traffic, highlighting that while the area experiences consistent marine use, it is not one of the most intensively trafficked parts of the Flow.

10.2.3 Project Design Envelope Parameters

This section outlines the Project Design Envelope Parameters to support the assessment of the impact pathways screened in to this Information to Inform Appropriate Assessment, as determined from the Project Description presented in Section 5.

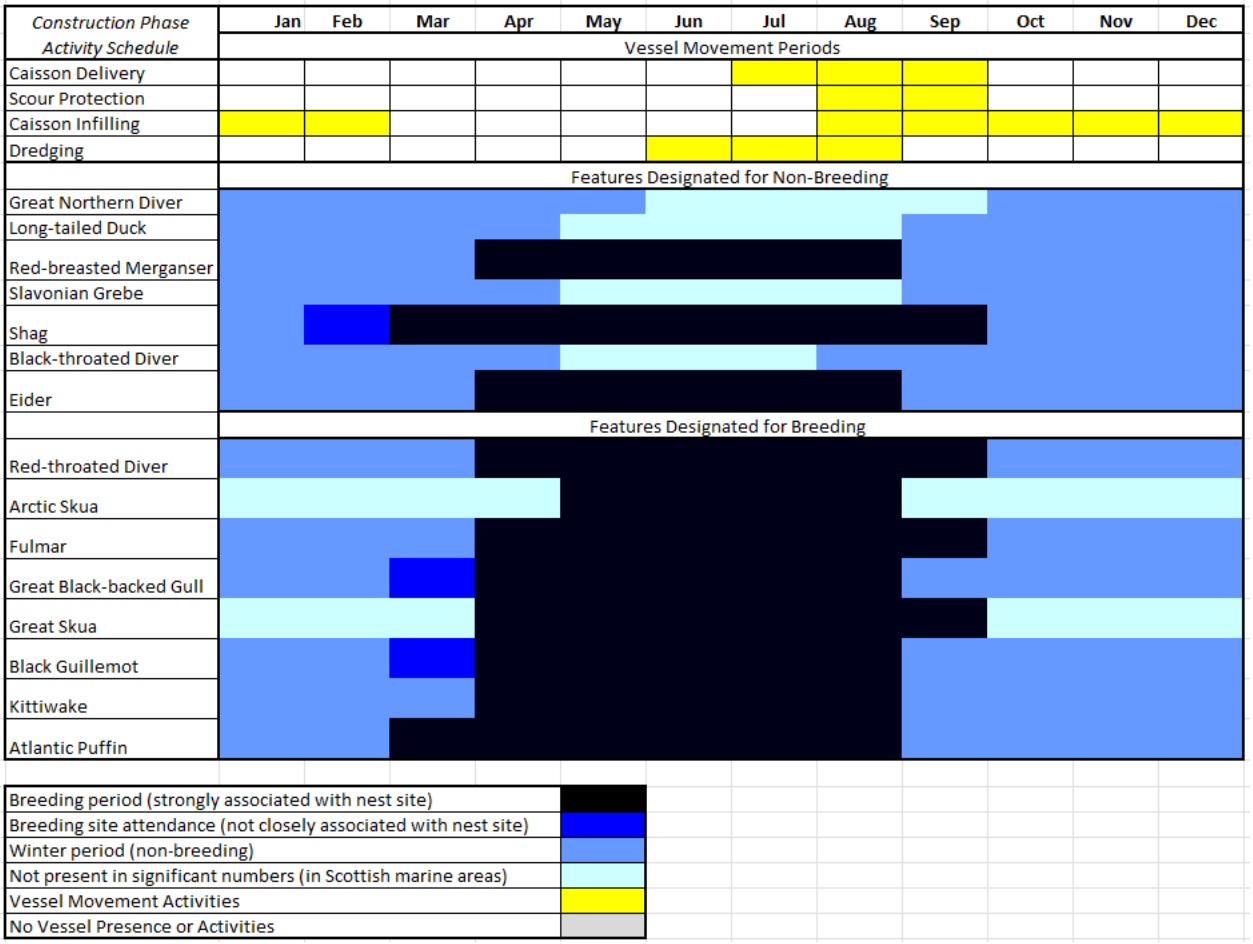
10.2.3.1 Vessel movements during construction

Per Table 5-3, the construction phase will see a total of 112 vessel movements over only an 8-month period between June 2028 and February 2029.

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 21.5 vessel movements per month on average (+0.16% from baseline) during winter months (October-March) and an additional 90.4 vessel movements per month on average (+0.5% from baseline) during summer months (April-September). This increase will be temporary over the construction period and vessel movements will occur only over only eight months of the 26-month construction period, between June 2028 and February 2029, inclusive.

Table 10-13 below illustrates they key vessel movement periods during construction, presented against key breeding and non-breeding periods for qualifying features to help inform the assessment.

Table 10-13 Vessel movement periods presented against key breeding and non-breeding periods for qualifying features



10.2.3.2 Vessel movements during operation

Per Section 5.4.1. there will be an estimated 192 operational vessel movements per year (approximately 154 in the summer months [April - September inclusive] and 38 in the winter [October – March inclusive]).

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 6 vessel movements per month on average (+0.3% from baseline) during winter months (October-March) and an additional 26 vessel movements per month on average (+1.0% from baseline) during summer months (April-September).

10.2.3.3 Crane operation

Crane usage will be during operation of the Project only. Cranes are used primarily to load/unload cargo to/from vessels. Crane operations will involve on-vessel cranes (approximately 70-125 m in height) and temporary mobile cranes positioned on the quay edge. Quayside cranes will include mobile cranes (up to 250 t and 60 m maximum boom height) and smaller support cranes (up to 90 t and 48 m maximum boom height). When not in use, the cranes will be lowered and the booms retracted horizontally.

10.2.3.3.1 Frequency and timing of crane activity

Crane use will be driven by vessel operations, with around 30 vessel trips per year requiring craneage (60 vessel movements). Approximately 24 of these trips will occur in summer and six in winter, equating to about four trips per month in summer and one per month in winter. As each vessel remains berthed for roughly 2–5 days, this results in cranes being active for approximately 8–20 days per month in summer and 2–5 days per month in winter.

Crane activity will be highly seasonal due to weather limitations, particularly wind. Winter conditions in Kirkwall result in more than 200 hours per month lost to wind, meaning that less than 20% of lifting operations can be undertaken in winter. Consequently, most heavy-lift operations—especially those requiring on-vessel cranes—will be scheduled for the summer months when weather conditions are more favourable.

The number of cranes operating at any one time will vary by season and task, with up to four cranes (one on-vessel crane and up to three mobile cranes) operating simultaneously during the summer period. In winter, activity will be substantially reduced, typically involving only two smaller mobile cranes, as large shipments requiring on-vessel craneage will be planned for summer.

Mobile cranes do not generally carry their own lighting, and winter lifting operations will normally be undertaken during daylight hours. This reduces the likelihood of artificial-light-related disturbance, as crane operations outside daylight periods are not expected.

10.2.3.4 Mitigation and Monitoring Measures

Section 7 outlines the Schedule of Mitigation the Project has committed to during both construction and operation phases. Those specifically related to this assessment of ornithological qualifying features (based on the impact pathways screened in) include:

- Adherence to a CEMD;
- Use of an ECoW;
- Pollution Incident Response Plan;
- Turbidity Monitoring;
- Vessel Management Plan;
- Use of a silt boom during construction;
- Marine Mitigation Zone;
- Ballast Water Management;
- Pollution Prevention Plan;
- Best Practice.

10.2.4 In-combination Assessment

Projects in and around Orkney are considered to have the potential to result in in-combination effects on ornithological features as qualifying interests of protected sites. The plans and projects considered for the in-combination assessment are outlined in

Table 10-14. This short-list has been derived from a long-list of plans and projects, which is provided in Appendix E: Long List of In-Combination Projects. To adequately assess in-combination effects, a thorough search of both the MD-LOT applications portal and the Orkney Islands Council planning applications portal was undertaken. By default, all aquaculture sites within Scapa Flow SPA with Marine Licence applications or planning applications submitted after the designation of the Scapa Flow SPA are included. For other development sites, a search of both planning portals for developments since 2022 was undertaken, and a determination was made whether to screen them in or out for assessment. Projects were screened out if there was no information on project specifics, such as impacts or adverse effects on SPA qualifying features or if projects were deemed to have been completed (i.e., marine licence expiry).

Overlapping construction periods and/or operational periods were also considered if these did not form part of the baseline. However if, for example, vessel movements of developments are already included in the estimates of operational vessel movements at the Project, these were screened out.

The West of Orkney Windfarm has been screened out of the in-combination assessment because vessel movements associated with the use of the SDWQ are already included within the Project-alone assessment. Therefore, including the West of Orkney Windfarm within the in-combination assessment on this basis would result in double-counting of the same vessel activities. Any other construction vessels associated with the West of Orkney Windfarm that do not utilise the SDWQ would have no pathway for interaction with the SPA features considered in this assessment, and therefore would **not adversely affect the integrity of the site**. Thus, no additional in-combination effects are predicted.

Table 10-14 Plans and projects considered for the in-combination assessment of ornithological features

Plan or Project	Development type	Status	Distance from Project
Ayre Offshore Wind Farm	Offshore Wind	Application	36 km
Orbital Westray Tidal Array	Tidal	Pre-Application (Scoping)	27 km
EMEC Fall of Warness	Tidal	Application	24 km
EMEC Billia Croo	Wave	Application	25 km
Mocean– East of Deerness	Wave	Pre-Application	13 km
Orkney–- Caithness	Cable	Under construction	22 km
SHEPD North Coast and Orkney cable route surveys (EPS Licence)	Cable	Consented	30 km
Backaland Pier, Eday	Ports and harbours	Application	28 km
Scammalin Bay (Faray)	Ports and harbours	Consented	33 km
Hatston Pier Expansion	Ports and harbours	Application	9 km
Eynhallow Sound	Aquaculture	Operational	24 km
Bay of Cleat, Westray	Aquaculture	Operational	42 km
Wyre	Aquaculture	Operational	22 km
Puldrite	Aquaculture	Operational	14 km
East of Skelwick Skerry, Westray	Aquaculture	Operational	41 km
Vestness, Westray	Aquaculture	Operational	45 km
Hunda, Scapa Flow	Aquaculture	Operational	6 km
Scarfhall Point, Westray	Aquaculture	Operational	44 km
Lober Salmon Farm, Scapa Flow	Aquaculture	Operational	9 km
East Moclett, North Sound	Aquaculture	Operational	44 km
Bringhead, Scapa Flow	Aquaculture	Operational	17 km

Plan or Project	Development type	Status	Distance from Project
Quanterness	Aquaculture	Operational	10 km
Westerbister	Aquaculture	Operational	550 m
Veantrow Bay, Shapinsay	Aquaculture	Operational	18 km
Chalmers Hope	Aquaculture	Operational	16 km
Toyness	Aquaculture	Operational	10 km
Bay of Cleat (south)	Aquaculture	Operational	42 km
Bay of Ham	Aquaculture	Operational	28 km
Bay of Vady	Aquaculture	Operational	24 km
Kirknoust	Aquaculture	Operational	25 km
Meil Bay	Aquaculture	Operational	9 km
Fara West	Aquaculture	Operational	15 km
Stronsay Harbour	Dredging & disposal	Application	32 km
Hatston, Kirkwall	Dredging & disposal	Application	9 km
Scammalin Bay (Faray)	Dredging & disposal	Consented	33 km

10.3 Impact Pathways

10.3.1 Disturbance of birds due to Project activities (all phases)

During construction and operation, increased levels of vessel traffic and other activities associated with the Project, such as terrestrial works, may cause direct disturbance to birds which use the Project site and surrounding waters for purposes such as foraging and roosting.

Temporary disturbance may cause changes in behaviour and could lead to a reduction in foraging opportunities or increased energy expenditure, resulting in impacts on vital rates, such as survival or reproductive success. Displacement may occur as a result of disturbance, causing birds to be excluded from areas of preferred habitat, either in the short-term or for long periods. Where this affects foraging habitat, this could lead to reduction in foraging opportunities, increased competition in other areas, or increased energy expenditure, resulting in impacts on survival or productivity in affected populations.

It is understood that disturbance may occur at a range of up to 1,000 m for diver species (Goodship and Furness, 2022), representative of the potential range of distances needed to protect birds from human disturbance. A similar disturbance range is applied for crane operations as a proxy.

10.3.1.1 Construction

Disturbance to bird species may occur through vessel presence and movement, dredging activities, and airborne noise through terrestrial works during the construction phase.

It is expected that construction will take a total of 26 months to complete and will be split into discrete stages as outlined in Table 5-1. While dredging works are required for the Project, these will be limited to ~12 weeks in summer 2028 (July-August).

10.3.1.1.1 Disturbance from vessels

In terms of potential disturbance from vessel movements, the maximum number of vessel movements is 112 over the 26-month construction phase (see Section 5.3.8 and Section 10.2.3).

During construction, vessel activity will be clustered around the quay; therefore if multiple vessels are on site at any one time the areas of potential disturbance from each vessel will overlap and the overall area of disturbance will be smaller. Thus, the total area affected by vessel disturbance over the construction phase will be small relative to the areas used by marine birds throughout the year (JNCC, n.d; JNCC, 2003-2013; Orkney Islands Council., n.d; Peters-Grundy *et al.,* 2026). Birds that are displaced from areas of vessel disturbance are likely to relocate to the extensive areas of similar habitat in the wider vicinity within the SPA. Disturbance/displacement associated with vessel activity is reversible, with studies indicating that numbers of non-wintering birds (common scoter; common eider; long-tailed duck; white winger scoter) present in the area where displacement occurred returns to pre-disturbance levels after a matter of hours (Schwemmer *et al*., 2011).

The majority of Project construction vessel movements will be along established routes (i.e., the main shipping channels in/out of Scapa Flow from the south (between Flotta and South Ronaldsay) and the west (between Hoy/Graemsay and Stromness)). Both routes experience moderate levels of existing vessel traffic, and the addition of small numbers of Project construction vessels will constitute only a minor departure from baseline levels of shipping. The only area that will experience a greater increase in vessel activity will be the 167 ha branching east off the established route, to the Project site (although there are baseline vessel movements in this area – as shown in Appendix A: Heat Maps and Noise Contour Maps).

During the 26-month construction period, the Project site will experience an increase of 0.16% vessel movements on average during winter months (October-March) and a 0.5% increase during summer months (April-September). This is not considered to constitute a significant change from baseline levels. Vessel movements through the individual species' breeding / non-breeding periods are presented in the respective assessment sections.

10.3.1.1.2 Disturbance form airborne noise (terrestrial works)

Empirical data specifically linking marine bird response to noise disturbance (and underwater noise in particular), separate from other sources of disturbance (e.g. vessel movement or human presence), is limited, and this source of disturbance on marine birds is not yet well understood. Recent research generally suggests that diving seabirds could be more sensitive to underwater noise than previously assumed. For example, hearing thresholds for great cormorant were found to be comparable to seals and toothed whales in the frequency band 1 to 4 kHz (Hansen *et al.,* 2017). A number of assessments have been conducted, based on the limited information available, and the similar frequency ranges between seabirds and phocid pinniped and cetacean species, applied methodologies developed for pinnipeds or low-frequency cetaceans in assessing seabird sensitivity to underwater noise (Teachout, 2012). Underwater noise modelling (Technical Appendix 5.6 of the EIAR) for dredging shows a TTS range of up to 250 m and a PTS range of 50 m or less for prolonged exposure (8 hours). One significant difference, however, between birds and marine mammals, is that while marine birds may use sound to communicate with conspecifics e.g. at breeding colonies, they are not known to be highly dependent on sound whilst foraging underwater.

The construction activities (excluding terrestrial blasting which is dealt with separately) have been highlighted in the Airborne Noise Report (Technical Appendix 9.1 of the EIAR; EnviroCentre, 2023), and noise contour maps have been prepared (see Appendix B: Bird Heat Maps and Noise Contour Maps) as having noise creation levels of between 70-90 dB(A) at 10 m from the source, with noise levels decreasing over distance. With the creation of a 4 m bund on the seaward side of the working area, the noise maps demonstrate that noise levels beyond the seaward bund would be between 40-50 dB(A) in the immediate vicinity of the bund and dissipate to <35 dB(A) at 250 m. A study compiled by the Institute of Estuarine and Coastal Studies, University of Hull (2013) found that construction noise emissions below 50 dB(A) had a low effect and no impact on waterbirds. Disturbance noise above 70 dB(A) resulted in a moderate to high effect on birds, resulting in movement within the feeding zone. The study concluded that construction noise levels should be restricted to below 70 dB(A).

10.3.1.1.3 Disturbance from terrestrial blasting

Terrestrial blasting associated with the construction phase could cause disturbance to bird species. Blasting is expected to be completed within the first 59 weeks of the landside earthworks programme. However, ground conditions may dictate a change in the blasting pattern, which may extend the blasting programme to up to 100 weeks. No more than two blasts would be carried out in any one week.. Routine blasting operations regularly generate air overpressure levels at the closest point to blast area of around 120 dB(A) but the intensity of these noise levels experienced at a distance from the blast site are affected by propagation loss, which is influenced by a range of meteorological conditions (wind speed and direction, temperature, cloud cover and humidity). Furthermore, blasting is characterised by short sound pressure impulses, whereby the pressure rises very rapidly then falls more slowly then returns to the ambient value after a small number of oscillations (typically within 1-2 seconds), meaning that terrestrial blasting typically manifests as a high-amplitude but short-duration impact. Terrestrial blasting will occur once a week over a 35-week period.

10.3.1.1.4 Mitigation

Mitigation measures, as outlined in Table 7-1, includes a Vessel Management Plan which will be adhered to, to minimise and where possible, avoid any disturbance impacts. This includes adherence to vessel speeds and routes, and adherence to Scottish Marine Wildlife Watching code, to minimise the potential for any disturbance. Mitigation measures of standard best practice in relation to navigational protocols and the CEMD will be issued to all vessel operators.

10.3.1.2 Operation and maintenance

As per the construction phase, increased levels of vessel traffic and other activities directly associated with the operation of the Project (such as crane movements) may cause disturbance to marine birds which use the area and surrounding waters for purposes such as foraging and roosting.

During the operational phase, the estimated number of vessels calling at the Project in the operational phase is 96 per year (192 vessel movements comprised of 154 in summer and 38 in winter), comprising 28 large vessels and 12 smaller vessels per year. Each of the 28 large vessels will have two associated pilot boat (2 vessel movements). In total, the estimated vessel movements per year is 192.

The majority of these vessels (approximately 80%) are expected to occur during the summer months (April – September), so there will be an increase of 26 vessel movements per month in summer and 6 per month in winter.

Based on baseline vessel movements (as informed by the NRA; see Appendix 2.3 of EnviroCentre, 2025a) and summarised in section 10.2.2.3, this will result in an additional 6 vessel movements per month on average (+0.3% from baseline) during winter months (October-March) and an additional 26 vessel movements per month on average (+1.0% from baseline) during summer months (April-September). This is not considered to constitute a significant change from baseline levels.

As per the construction phase, the total area affected by vessel disturbance and crane operation will be small relative to the areas used by marine birds throughout the year as evidenced by the HiDef survey data (Peters-Grundy *et al.,* 2026) and other broad scale surveys within Scapa Flow that were used to designate the SPA (JNCC, n.d; JNCC, 2003-2013; Orkney Islands Council., n.d). Birds that are displaced from the areas of vessel and crane disturbance are likely to relocate to the extensive habitat in the wider vicinity within the SPA. Disturbance/displacement is reversible, with studies indicating that numbers present in the area where displacement occurred returns to pre-disturbance levels after a matter of hours (Schwemmer *et al*., 2011).

Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

10.3.2 Disturbance to prey species and habitats of prey species (construction only)

Indirect effects on marine birds may occur as a result of changes in prey distribution, availability or abundance. Reduction or disruption to prey availability for marine birds may cause displacement from foraging grounds in the area or reduced energy intake, affecting survival rates or productivity in the population in the short-term.

Construction activities such as dredging may lead to temporary habitat loss or disturbance. The proposed dredge volume is 379,407 m^3. The volume of fines within the proposed dredge budget is 53,022 m^3. The duration of the proposed dredge campaign is 12 weeks, with a proposed dredge rate of 1,578 m^3/day (or 65.75 m^3/hr). There is therefore considered to be an average fines dredge rate of 9.53 m^3/hr.

Although seabed sediments will be disturbed or removed within a spatially limited area during construction, seabed habitats are expected to commence recovery immediately following completion of construction, which will allow key prey species to repopulate the areas of disturbance. In some areas, where e.g. soft seabed sediments have been replaced by hard structures, the community composition of those habitats may change, albeit in a small spatial area associated with the installation of the new quay.

SSC increases and associated sediment deposition may also reduce abundance and distribution of prey species. Dredge plume dispersal modelling (Technical Appendix 4.1, Volume 3 of the EIAR; EnviroCentre, 2023) indicates that due to the relatively coarse nature of the dredge budget, and the weak tidal currents within the vicinity of the dredge pickets, plumes generated as a result of the dredging works will be very localised, and short-term in duration. Low current speeds mean that sands and gravels lost to the water column during dredging will fall out of suspension immediately, entirely within the footprint of the dredge. Clay and silt lost to the water column will remain in suspension for longer, being dispersed gradually over the tidal cycle and settling out of suspension more slowly. Total SSC are predicted to be low, highest within the dredge zone and immediate surroundings, decreasing towards the plume limits. The modelling outputs indicate that deposition from the proposed dredging is highly localised, with measurable sedimentation (up to 0.03 m) restricted to the dredge footprint. Deposition thickness decreases sharply with distance, falling to negligible levels within tens of metres of the dredging area. No appreciable accumulation is predicted elsewhere in Deepdale Bay or within the broader Scapa Flow environment.

This may result in short-term avoidance of affected areas by prey species (fish and sessile organisms). Adult fish have high mobility and may show avoidance behaviour in areas of high sedimentation (Kjelland, *et al*., 2015). Most bivalve molluscs are known to be highly tolerant to sediment deposition due to the nature of re-suspension and deposition within their natural high energy environment, and it is therefore very likely that any effect from increased SSC during construction will be limited. Deposited sediments are expected to be removed by the currents and dispersed gradually, resulting in thin layers of sediment being deposited. Given the small amount of predicted deposition, the local spatial extent and relatively short duration of the predicted SSC increases, no effect on survival of any prey species is predicted.

Increases in SSC and the resulting reduction in water clarity may impair the ability of foraging marine birds to detect fish both at the surface and within the water column, potentially reducing access to important prey. However, the low-level and short-term duration of these SSC increases means that most marine bird species will be largely unaffected.

There is the potential for understand sound and vibration during construction to affect the abundance and distribution of prey species. Construction activities will generate a degree of underwater noise (for example, from dredging) but this is not considered to be significant with respect to its intensity and duration. Noise and vibration emitted by construction activities is anticipated to be highly localised, and short-term in nature.

Construction impacts to fish species, from underwater noise and pollution, was assessed as being of low magnitude and not significant in the EIAR (EnviroCentre, 2023).

As a precautionary measure during construction, the Project proposes to undertake turbidity monitoring to protect water quality and ensure minimal environmental impact. The Project propose to monitor sediment re-suspension levels to prevent damage to the local ecosystem and aquaculture as high sediment concentrations can contribute to suboptimal conditions and may harm aquaculture fish since it affects the overall ecological balance and the fish have restricted movement. By monitoring turbidity, the Project can determine potential impacts on the environment and implement corrective actions.

The construction-phase impacts on marine bird prey resources are expected to be short-term, temporary, reversible and recoverable, with any changes remaining transient and confined to a small spatial extent relative to the extensive alternative foraging habitat available to seabirds. Localised increases in SSC and temporary seabed disturbance resulting from dredging will be short-lived, with coarse sediments settling rapidly and finer sediments dispersing gradually to form only thin, limited deposits. Seabed habitats are anticipated to commence recovery immediately once construction ends, enabling prey communities to repopulate disturbed areas. Most prey species, including mobile fish and sediment-tolerant bivalves, are expected to demonstrate avoidance behaviour or natural resilience, reducing the likelihood of any significant or lasting effect on prey availability. Underwater noise and vibration will be low in magnitude, highly localised, and short-term, further supporting the assessment that impacts will be minimal. With turbidity monitoring in place to manage potential effects on water quality, and given the very small scale of predicted changes in prey abundance or distribution relative to the wide foraging ranges of SPA seabird species, any indirect effects on marine birds are assessed as not significant, temporary, and fully recoverable. As such, construction effects on qualifying bird features are not likely to significantly alter the overwinter survival of non-breeding birds, or the breeding success and survival of breeding birds.

10.3.3 Accidental release of contaminants or pollutants (all phases)

Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on qualifying ornithological features. The potential for accidental pollutant release may arise from the following Project activities:

- Vessel activity (fuel, oils, lubricants, hydraulic fluids);
- Refuelling, maintenance, and engine operation;
- Accidental spills of construction-related materials; and
- Loss of containment from plant, machinery, or storage facilities.

The main risk is considered to be posed by refuelling activities. Oil or fuel spillages to the water environment would be detrimental to the water and sediment quality, fauna and flora. Accidental releases of pollutants pose a potential risk to ornithological features and their prey through degradation of water quality.

As outlined in Section 7, the Project will implement and adhere to industry best practice and standard mitigation measures to reduce the risk and effect of accidental release of hazardous substances. This includes adherence to a Project CEMP during construction. The CEMP includes a Pollution Prevention Plan and a Pollution Incident Response Plan to which the Project will adhere.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

Release of toxic materials during dredging is not considered to be likely as sediment sampling found no contaminants at levels likely to significantly affect water quality or pose a hazard to marine life (EnviroCentre, 2023).

Procedures will be in place to minimise the effect of any accidental release if it occurs. Accidental release of potential contaminants from construction vessels will be strictly controlled. Any accidental release of pollutants during construction is expected to be of small magnitude, confined to a very localised area, and although the potential consequences would be high, the likelihood of such an event is deemed extremely low due to mitigations in place. As such, any accidental spill would be short-duration, temporary, and reversible, with rapid containment ensuring full recovery.

10.3.4 Ornithological habitat changes (operation and maintenance only)

Operation and maintenance activities required for the Project (vessel presence and movement, onshore vehicle movement, and mobile cranes) may potentially result in changes to lower trophic levels (e.g. benthic fauna and forage fish species) which may result in changes to foraging opportunities for the qualifying features of the SPAs.

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA. This equates to 0.06% of the total SPA area (31,819 ha). The habitat functions lost will relate primarily to marine foraging areas used by qualifying bird species.

10.4 Scapa Flow SPA

10.4.1 Site Description and Qualifying Features

Scapa Flow SPA comprises a total area of 31,819 ha located within Scapa Flow (NatureScot, 2022b), an enclosed sea area, sheltered by Mainland Orkney to the north; Hoy, Graemsay, South Walls and Flotta to the west and south; and Burray and South Ronaldsay to the east. The Flow is linked to the Pentland Firth in the south through the Sound of Hoxa, and to the Atlantic Ocean in the west through Hoy Sound. The site also includes nearshore waters to the east of Orkney, extending from South Ronaldsay to Deerness, and including the sheltered shallow waters of Holm Sound, between Burray and East Mainland, but is almost cut off from the North Sea by the Churchill Barriers. It encompasses a range of sheltered and diverse marine communities which provide a range of food resources for breeding, moulting and roosting sea birds. Scapa Flow SPA directly overlaps the Project site. It is designated for a number of non-breeding seabirds and waterbirds, and one breeding bird species, the red-throated diver (Table 10-15).

Table 10-15 Protected feature and condition for the Scapa Flow SPA (NatureScot, 2022b)

Protected feature	Feature condition	Assessment date	Broader conservation status*
Black-throated diver (non-breeding)	Favourable	Not yet assessed	UK: Amber European region: Least Concern
Great northern diver (non-breeding)	Favourable	Not yet assessed	UK: Amber European region: Least Concern
Long-tailed duck (non-breeding)	Favourable	Not yet assessed	UK: Red European region: Least Concern
Red-breasted merganser (non-breeding)	Favourable	Not yet assessed	UK: Amber European region: Near Threatened
Red-throated diver (breeding)	Favourable	Not yet assessed	UK: Green European region: Least Concern
Shag (non-breeding)	Favourable	Not yet assessed	UK: Red European region: Declining
Slavonian grebe (non-breeding)	Favourable	Not yet assessed	UK: Red European region: Near Threatened
Eider (non-breeding)	Favourable	Not yet assessed	UK: Amber European region: Endangered
***UK Broader conservation status based on Birds of Conservation Concern 5 (BoCC5) and European region is based on BirdLife International, 2021.**			

10.4.2 Conservation Objectives

The Conservation Objectives of Scapa Flow SPA (NatureScot, 2022b) are:

1. To ensure that the qualifying features of the Scapa Flow SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of the Scapa Flow SPA is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

- 2a. The populations of qualifying features are viable components of the site.
- 2b. The distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance of the species.
- 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained.

Supplementary conservation and management advice to support the achievement of the conservation objectives is provided by NatureScot (2022a) and is considered in the assessments below.

10.4.3 Assessment of Adverse Effects Alone

10.4.3.1 Disturbance of birds due to Project activities (all phases)

10.4.3.1.1 Black-throated diver (non-breeding)

10.4.3.1.1.1 Vessel disturbance

During construction, the number of vessel movements relevant to the black-throated diver non-breeding period for which they are a qualifying feature (August-April, see Table 10-13) will see an average 0.35% increase of vessel movements over current winter baseline levels, with no increase in vessel movements in March or April. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the black-throated diver non-breeding period (August-April) are expected to comprise an average monthly increase of 13 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.5% from current baseline levels.

Black-throated diver display a very high sensitivity to disturbance (Table 10-11). In previous correspondence, NatureScot suggested referring to Guidance Note 8: Guidance to Support Offshore Wind Applications: Marine Ornithology Advice for assessing the distributional responses, displacement and barrier effects on Marine birds. Specifically, the suggestion was to undertake a matrix-based model to calculate potential displacement and mortality as a result of the Project on black-throated diver. This has been undertaken (see Appendix D: Mortality Matrix Model). It should be noted that there are inherent flaws in this method, particularly around the use of precautionary principles. A recent paper (SOWEC, 2025) has highlighted these flaws, namely:

- Applying precaution at multiple points in the impact assessment process means precaution is compounded through the assessment, resulting in potentially excessive levels of precaution in outputs;
- Current approaches produce precautionary estimated impacts that are very likely to be larger than true impacts that could occur if a proposed project became operational;
- The extent of precaution in these estimated impacts (i.e. the extent to which precautionary estimated impacts are greater than true impacts) is not transparent; the likelihood of these estimated impacts occurring is not considered; and scientific uncertainty is not fully taken into account; and
- Statutory Nature Conservation Body (SNCB)-advised approaches lack transparency and consistency in how scientific evidence is evaluated and used to inform the precautionary approach presented in SNCB guidance and advice.

The matrix table has been populated for black-throated diver using the mean peak across the three winters of survey effort (7, 11 and 27 – mean peak of 15 birds[10] km buffer), indicating the highly mobile nature of the

[10] Mean peak count of 15 is calculated using year 1 to 1km (7 birds) and year 2 (11 birds) and 3 (27 birds) out to 2 km.

species within the SPA, and the high variability and ephemeral occurrence of the species in the vicinity of the Project.

Daily and hourly peaks were obtained from the survey data[11]. Table 10-16 presents the average daily and hourly peaks from 2021/22 and 2023/24.

Table 10-16 Average daily and hourly peaks from 2021/22 and 2023/24

Year	Buffer	Season peak	Average daily peak	Average hourly count
2021/22	2 km	11	3.54	2.08
2023/24	2 km	27	6.00	2.78
2023/24	>2 km*	29	9.32	4.89
***These data included to provide context regarding the ephemeral nature of the peak counts over the survey period (not material to the conclusions of the HRA).**				

It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur less than once per day across the construction and operational phase with vessel movements likely to be fewer than twice a week in the winter (taking the precautionary approach) as opposed to continuously. During the 2021/22 surveys, a small test rig and associated vessels did not entirely displace black-throated divers, and birds were still present and observed moving through the site (present on 14/24 watch days or 58% of watch days), which supports the consideration that no barrier effects will occur and it is unlikely that barrier effects would be associated with vessel movements from the Project.

The matrix model assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, based on an average seasonal peak count of 15 birds (Table 10-6). This equates to 0.135 birds annually, or 0.2% of the SPA population per year. Over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 3.375 birds, or 6% of the SPA population at designation. This equates to a mortality of one bird every 7.4 years as a result of an increase in 0.35% and 0.5% from current baseline levels of vessel movements during the construction and operational phase, respectively.

10.4.3.1.1.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and occurring in short periods during vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and larger on-vessel cranes, with operations occurring over 8–20 days/month in summer (April-August) and 2–5 days/month in winter (October-March). Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m and remain stationary when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

NatureScot advise that divers are particularly sensitive to disturbance and displacement, which also includes visual disturbance and displacement caused by tall, unfamiliar structures in the marine environment (Dierschke *et al.*, 2017). With regards to cranes, there is no evidence available to suggest that quayside cranes cause disturbance and displacement to black-throated diver. The justification for birds being sensitive to towering structures is based on offshore windfarms/turbines and make no mention of coastal developments and/or quayside crane use within such facilities. There are important differences between offshore windfarm structures and land-based cranes, including:

- **Height**: As stated, land-based cranes for the Project range from approximately 48 – 60 m in height. Vessel-mounted cranes are approximately 70 – 125 m in height. It is likely that the smaller cranes will be used during the winter months. Offshore wind turbines are taller, typically approx. 140 – 190m (to

[11] Using the 'max counts' worksheet in each seasonal Excel document getting an estimate of the average hourly count by going through the field sheets and black-throated diver swimming track maps or location maps to identify four points

blade tip) for existing UK offshore wind turbines[12], with the latest projects projecting heights well over 200m.

- **Number and Area**: Up to 4 cranes will be in use at the Project in summer (one on-vessel crane plus 3 mobile quayside cranes). In winter, up to 2 mobile quayside cranes is more realistic given that large shipments requiring on-vessel cranes will take place in summer months. The number of turbines at existing UK offshore wind farms is significantly greater (e.g. 102 for East Anglia One; 174 for Hornsea One). Cranes at the Project are contained to an area approx. 0.2 km^2, whereas existing UK offshore wind farms typically cover 100s of km^2. The area of potential disturbance is, therefore, significantly larger for offshore wind farms.
- **Location**: The landform behind the Project slopes sharply to approximately 20 m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60 m above quay level (within 1 km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against surrounding landform. UK marine wind farms are typically located far offshore in isolated locations.
- **Operation**: Wind turbines are permanent and (near) constantly operating, predominately at speeds greater than that of a crane rotation/slewing. The use of cranes at the Project site is time-limited: in summer cranes are likely to be active between 8 – 20 days per month, and in winter 2 – 5 days per month. In summer, mobile cranes will typically be stored onsite, and in winter either stored onsite or taken offsite if they are required elsewhere. Mobile cranes when not in use will be lowered with booms retracted and placed horizontally (approx. 5 m in height). Lifting operations in winter will typically be carried out in daylight hours. The duration and nature of crane operations is, therefore, significantly different to offshore wind turbines.

In correspondence regarding this application, NatureScot advised referring to Guidance Note 8: Guidance to Support Offshore Wind Applications: Marine Ornithology Advice for assessing the distributional responses, displacement and barrier effects on marine birds. Although the use of offshore wind guidance is not considered directly applicable, it has been considered as a proxy based on NatureScot advice for vessel disturbance, due to the novelty of this activity at the Project site and the relatively nearshore distribution of black-throated diver. It is not, however, considered appropriate to use this guidance when assessing the response of black-throated divers to mobile cranes. While evidence (Jarrett *et al*., 2018) suggest that divers show evasive actions as a result of a moving vessel, this is significantly different to potential impacts from land-based cranes. Whilst it is agreed that there would be an energetic cost to stopping feeding and flying considerable distances, this does not correspond with findings from the Jarrett *et al.* (2018) study where disturbance from vessels resulted in not a single flight response (evasive action comprises a dive or swim away), and no flight responses of black-throated diver were recorded during the three years of surveys. Responses from black-throated divers significantly favoured swim or dive responses to passing vessels. It is nevertheless possible that black-throated divers will avoid areas where marine activities take place. The 2 km response of black-throated diver from structures in the marine environment is based on flying around a turbine array (avoidance around a windfarm that is large in area), which is very different to a land-based crane in a coastal setting and viewed against a land-based background.

Black-throated diver are considered to have a very high sensitivity to disturbance and displacement from vessels (Table 10-11). In the absence of any evidence of divers being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance when compared with mobile vessels at sea: while they nonetheless present a tall structure which can be moving, they move slowly, within confined bounds limited by the crane height and jib length.

Additional project-specific evidence indicates that black-throated divers exhibit relatively limited behavioural responses to vessel activity, as mentioned in Section 10.2.1.3.6. During the ornithological surveys, black-throated divers generally exhibited low-level responses to vessel activity. Of the recorded interactions, half of the resulted in birds swimming slowly away, two birds responded by diving, two showed no observable response, and only one bird displayed an alert response. These observations are consistent with Jarrett *et al.* (2021), who found that black-throated divers exposed to ferry traffic in Scapa Flow responded by swimming,

[12] Rampion: 140 m tall; Hornsea One: 190 m tall; East Anglia ONE: 167 m tall.

diving, or indicated no observable response. The behavioural responses observed and recorded indicate that black-throated divers can move away from the localised disturbance, associated with the Project activities.

There is no published evidence of the effect of cranes on black-throated diver. However, there is anecdotal evidence[13] and data records[14,15] of black-throated divers occurring within and close to harbours during the non-breeding period, including commercial harbours where cranes may be present. Sightings of black-throated divers during the non-breeding period are most frequently reported from bays and sea lochs, and sometimes from reservoirs. These sightings suggest that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project. Such records are generally uncommon and typically based on observations and photographs submitted by bird recorders and photographers (NBN Atlas, 2026).

NatureScot requested an assessment of black-throated diver disturbance up to 1 km (recommended disturbance buffer for this species; Goodship and Furness, 2022) from cranes during their flightless moult period (mid-September to end of December; Table 10-3). It is acknowledged that counts should be taken as a minimum, as they are of birds recorded to 1km from the Vantage Point and not 1 km from the development footprint, but it highlights a more realistic picture of the use of the site by these birds as opposed to peak numbers, which were recorded extremely infrequently during the surveys. To account for the fact that the VP is not 1 km from the Project, the average counts for the 2 km buffer have also been presented. Although peak counts are often required to be used for assessment purposes, a better barometer of importance should be the average peaks across all years of survey. This is 1.5 birds out to 1 km (Table 3 of EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report; EnviroCentre, 2023), or 2.6% of the SPA population. During the flightless moult period (mid-September to end of December), again the better barometer is average counts to 1km, which is 2.25 or 4% of the SPA population. It also demonstrates further that this species does utilise other areas of Scapa Flow successfully and that the Flow has sufficient capacity to support this species. The average seasonal peak count out to 2 km of the flightless moult period is 15 birds, which is the same as the seasonal average for the entirety of the survey period.

Given the infrequent nature of crane usage during the winter months, and particularly during the birds' flightless moult period, any disturbance to black-throated divers from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. For the majority of the non-breeding period, black-throated divers will not be disturbed by either cranes or vessels. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence as observed during surveys, no significant or sustained impact is anticipated.

10.4.3.1.1.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bund between the working area and the marine environment will result in construction sound dissipating to <35 dB(A) at 250 m, a typical baseline level at which there is no evidence for disturbance.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), to a distance where noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

10.4.3.1.1.4 Conclusion

As described above, Jarrett *et al.* (2018) found that disturbance from vessels did not result in regular flight responses from black-throated divers. The 2 km response of black-throated divers from structures in the marine

[13] https://www.birdsofpooleharbour.co.uk/sightings/harbour-update-07-01-25/
[14] NBN Atlas - Black-throated diver records
[15] EnviroCentre, 2024b – record of black-throated diver presence in working harbour area (Hatston)

environment is based on flying around a turbine array, which has a very different presence to land-based cranes in a coastal setting and viewed against a landform backdrop higher than the quayside cranes themselves.

This assessment presents mortality based on a displacement matrix approach which uses average peak counts as its basis. Although this constitutes a realistic worst-case scenario, given the natural variability in distribution of black-throated diver within Scapa Flow SPA, it is highly likely that disturbance on any given day of the non-breeding period for this species would affect fewer birds than this average peak number. Furthermore, while disturbance is possible, the consequences of disturbance are limited. Black-throated diver are widely distributed around nearshore areas of Scapa Flow, and have extensive access to alternative foraging habitat in the SPA where they target fish prey (as well as resting). Survey data demonstrates the widespread distribution of the species throughout coastal fringes of the site. Vessel movements and crane operations are not continuous pressures on this species during the non-breeding period when they are present in Scapa Flow SPA. These pressures are intermittent, temporary, and the disturbance ceases once the activity ceases (e.g. once a vessel has passed through black-throated diver nearshore habitat, or crane operations cease). When vessels are not transiting/cranes are not operating (i.e. the majority of the time, during the non-breeding period), black-throated will have unimpeded access to the locality of the Project, and therefore disturbance is neither continuous nor sustained.

The additional mortality of 0.135 deaths per year as a result of the Project is based around the conclusions of the displacement matrix assessment, which assumes that for 90% displacement of the average peak number of birds occurring within 2 km of the Project, there will be a 1% increase in mortality. Given the intermittent presence of disturbing factors (vessels, cranes), and the availability of alternative habitat within Scapa Flow SPA, these 90% displacement/1% increase in mortality assumptions are likely to be precautionary.

Against a reference population of 57 birds, this level of additional mortality equates to 0.24% of the SPA citation population per year. However, Scapa Flow SPA is not a closed population, and the wider population (from which birds migrate to spend the non-breeding period in Scapa Flow SPA) is likely to be much larger, as it comprises birds breeding in Scotland (ca. 200 pairs) and birds from the wider boreal North Atlantic region (e.g. Scandinavia) (NatureScot, 2022b). Measured against this wider population, the *per capita* impacts are greatly reduced. Furthermore, considering this mortality as a percentage of the population (i.e. 6% of the SPA citation population) is misleading, because it does not take into account replacement from the breeding population (either in Scotland or further afield), which is not well understood or clearly defined.

The natural, annual mortality among a population of 57 adult black-throated divers (based on an annual survival rate estimated to be 0.89 ±0.01; BTO, 2026) is ~6.2 adult birds per year; or more, if a proportion of the Scapa Flow SPA population is made up juveniles with a lower annual survival rate of 0.400. When considered over a 25-year period, a minimum of 155 birds associated with Scapa Flow SPA would die (natural mortality), based on adult survival of 0.89 and assuming that the population of 57 birds is comprised entirely of adults. If a proportion of this population is comprised of juveniles, this 25-year mortality estimate would be significantly higher, owing to lower juvenile survival. When considered over a period of 25 years, the cumulative mortality of 3.375 birds as a result of the Project is an extremely small perturbation within the range of natural variation. The mortality of <4 birds as a result of the Project (based on mortality of 0.135 individuals per year) is extremely unlikely to lead to long-term population reduction or sustained distribution change. Note that over a 25-year period, given an average 12-year lifespan for black-throated diver, the entire population will be replaced >2 times. The mortality of <4 birds as a result of the Project over a period of 25 years, against a background of natural interannual variability in a wintering population, is not distinguishable from natural variability and is not detectable by any monitoring programme that could realistically be deployed.

It is therefore concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the black-throated diver. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid adverse impacts on marine bird species, including black-throated divers; particularly, adherence to environmental mitigation measures described within

a VMP, which include vessels travelling at slow speeds, avoiding birds rafting on the water in line with the Scottish Marine Wildlife Watching Code, and staying on pre-determined vessel routes.

Furthermore, for the first three years of Project operations, during the flightless moult period (mid-September to end-December), an ornithologist will conduct structured observations of black-throated divers associated with selected crane activity. The Ornithological Observation Protocol will be included in the Operational Environmental Management Plan. This will include:

- Timing: Observations will take place two hours prior to, during, and two hours following crane operations (subject to adequate visibility).
- Data collection: Counts of individuals present and systematic recording of any behavioural responses indicative of disturbance (e.g. displacement, diving, directional swimming, or other changes in activity).
- Reporting: Data will be collated into a post-season summary at the end of each flightless moult period. Reports will be submitted to the Orkney Marine Environment Protection Forum.

The purpose of these observations is to improve the evidence base on black-throated diver responses to mobile crane operations.

Based on the evidence outlined above, in consideration of the inherent conservatism in the assessment, natural variability in the distribution of the species within Scapa Flow SPA, and when considering the mitigation measures committed to by the Project, it can be concluded that the predicted disturbance impacts on the black-throated diver qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

However, as advised by NatureScot through correspondence received to date (June 2026), NatureScot advise *'the development and associated operations will undermine Conservation Objective 2b [the distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance to the species] and therefore lead to adverse effect on site integrity for the black-throated diver'* in the Scapa Flow SPA.

10.4.3.1.2 Great northern diver (non-breeding)

10.4.3.1.2.1 Vessel disturbance

During construction, the number of vessel movements relevant to the great northern diver non-breeding period for which they are a qualifying feature (October-May, see Table 10-13) will see an average 0.12%[16] increase of vessel movements, over current winter baseline levels. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and, during the great northern diver non-breeding period (October-May), are expected to comprise an average monthly increase of 11 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.5%, from current baseline levels.

The study undertaken by Jarrett *et al,.*(2018) demonstrated that great northern diver do not typically fly in response to vessels, with all evasive methods recorded being a swim away or dive. Given the speeds of vessels within Scapa Flow and that vessels movements for the Project will adhere to a VMP.

Figure 10-2 shows an analysis of the mean density of great northern diver across Scapa Flow (taken from HiDef survey reporting). It does show that great northern divers are well represented within current shipping lanes, which does suggest a degree of habituation to vessels, contrary to reports that great northern divers are highly sensitive to vessel movements. This has also been demonstrated by a short study undertaken in 2015 (Gittings, e*t al,* 2015) that showed that great northern divers did not exhibit a "flush response" 89% of the time (57 out of 64 incidents), even when the survey boat passed within 10-20m of a bird.

[16] Note because great northern diver non-breeding period continues into May, this takes into account two additional months of 'summer' movements, which makes this value slightly different to the 0.5% increase in more typical *winter* months (October-March) which is stated elsewhere.

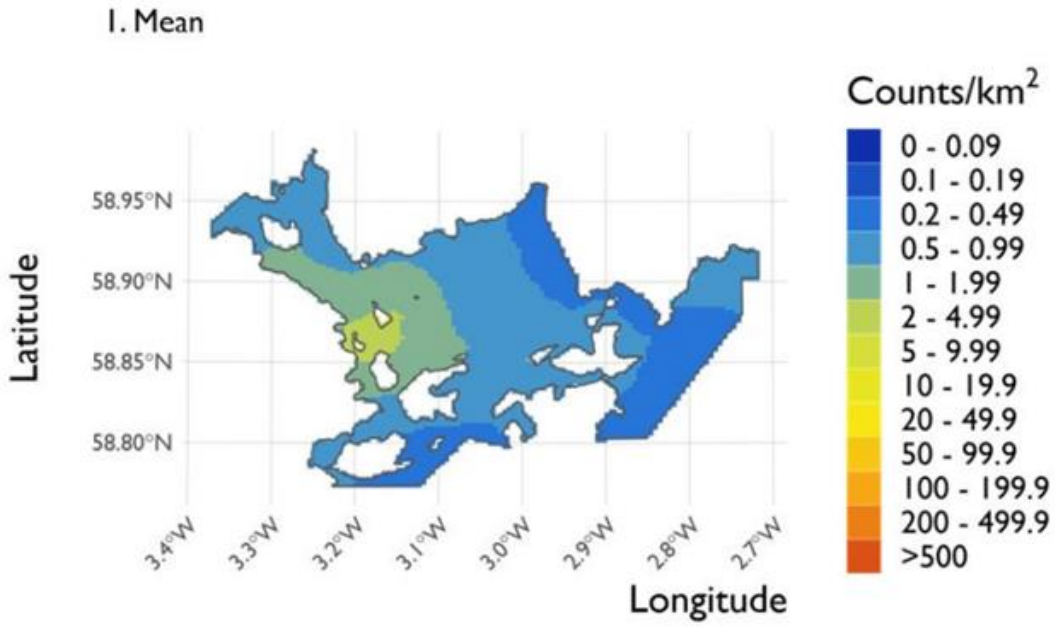


Figure 10-2: Modelled great northern diver densities across Scapa Flow SPA (taken from HiDef 2022/23 wintering bird survey report).

During the ornithological surveys undertaken between 2020 and 2022, bird and boat interactions were recorded. For great northern divers, there were 49 observations of interactions with boats. Of these, 24 resulted in no reaction, 10 resulted in birds swimming away slowly, 11 were of birds diving, and three caused an alert (sitting) response. There were no instances of boat movements causing a flight response. This correlates with the findings of Jarrett *et al* (2021), where at least 95% of reactions to vessels were either no response, slowly swimming away or diving. There were very few instances of vessels causing a flight response.

Despite the evidence from the Gittings, e*t al.* (2015) study mentioned previously, great northern divers are considered to display a high sensitivity to vessel disturbance (Table 10-11; Furness *et al.* 2012). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2). It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur less than once per day across the construction and operational phase with vessel movements likely to be fewer than twice a week in the winter (taking the precautionary approach) as opposed to continuously.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

The matrix model assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, based on mean seasonal peak count of 46 birds (

Table 10-2). This equates to 0.414 birds annually, or 0.08% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 10.4 birds, or 2% of the SPA population at designation, over 25 years. This equates to a mortality of one bird every 2.4 years as a result of an increase in 0.12% and 0.5% from current baseline levels in vessel movements during the construction and operational phase, respectively. During the flightless moult period, the mean seasonal peak count is 33 birds (Table 10-3), which would equate to a mortality of 0.3 birds annually, or 0.06% of the SPA population. Over 25 years, this would result in a mortality figure of 7.4 birds, or 1.5% of the SPA population.

10.4.3.1.2.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The differences between offshore windfarm structures and land-based cranes is provided in Section 10.4.3.1.1.2, providing justification for the caveats in sensitivity of divers to displacement and disturbance from quayside cranes and using offshore wind guidance.

Great northern diver are thought to have a high sensitivity to disturbance and displacement from vessels (Table 10-11). In the absence of any evidence of divers being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance when compared with mobile vessels at sea: while they nonetheless present a tall structure which is moving, they move slowly, within confined bounds limited by the crane height and jib length. There is no published evidence of the effect of cranes on great northern diver, however the common presence of great northern diver in harbours during the overwinter period suggests that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project.

Great northern divers are most sensitive during their flightless moult period (February to mid-April; dates provided by NatureScot in correspondence) as during this period they cannot take evasive action by flight. The average peak count of great northern divers during their flightless moult period out to 2 km is 33 birds (Table 10-3) or 6.5% of the SPA citation population. However, as per NatureScot correspondence, it is suitable to use survey data within 0-500m of the main vantage point to assess disturbance and displacement of great northern diver based on a disturbance distance of 100-300m as per Goodship and Furness (2022). The average peak count therefore demonstrates that the species does utilise other areas of Scapa Flow successfully, and that the Flow has sufficient capacity to support this species.

During construction, the number of vessel movements relevant to the great northern diver non-breeding period (October-May) will see an average 0.12% increase of vessel movements, over current baseline levels between October and May. Operational phase vessel movements are expected to comprise an average monthly increase of 11 vessel movements over the same period. This constitutes an average increase to the monthly vessel movements of 0.5%. Given the infrequent nature of crane usage during the winter months (2–5 days/month between October-March) and 8-20 days/month in April and May, any disturbance to great northern divers from vessel activity and crane use is expected to result only in temporary disturbance, particularly during the majority of the flightless moult period, with effects that are intermittent during cargo loading and unloading operations. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.2.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement, or reduce access to, preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Table 10-17 shows peak and average counts using the data collected over the 3 years of site surveys between the 0-500m distance band (based on survey area coverage).

Table 10-17: Peak and Average counts of great northern diver within 500 m of the Project site.

Distance band	Survey period	Peak month	Peak number	% SPA population (505 birds)	Average number (Oct/Nov to April)	% SPA population (505 birds)
0 – 500 m	Yr 1 - 2020/21	April	8	1.6%	2.04	0.4 %
	Yr 2 - 2021/22	March	9	1.8%	2.16	0.4 %
	Yr 3 - 2023/24	Nov	6	1.2%	2.13	0.4 %

The peak count of nine birds corresponds to a maximum of 1.8% of the SPA population, with average counts corresponding to 0.4% of the SPA population (at the time of citation). The average of the peak counts of 7.7 birds represents 1.5% of the SPA population. Using the count data from 2017/18 (Section 10.2.1.1.2), these numbers correspond to 1.1% and 0.26% respectively, and 0.8% and 0.2% respectively for the 2021/22 and 2022/23 HiDef survey population estimates. These are considered low.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including great northern diver.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the great northern diver. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere. Based on the evidence outlined above and when considering the mitigation measures committed to by the Project, it can be concluded that the predicted disturbance impacts on the great northern diver qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.3 Red-throated diver (breeding)

10.4.3.1.3.1 Vessel disturbance

During construction, the number of vessel movements relevant to the red-throated diver breeding period for which they are a qualifying feature (April-September, see Table 10-13) will see an average 0.58% increase of vessel movements over current summer baseline levels, with no vessel movements predicted for April or May. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and, during the red-throated diver breeding period (April-September), are expected to comprise an average monthly increase of 26 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 1.0% from current baseline levels.

Red-throated diver display a very high sensitivity to vessel disturbance (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections

10.2.3.1 and 10.3.1.2). It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur less than once per day across the construction and operational phase with vessel movements likely to be fewer than twice a week in the winter (taking the precautionary approach) as opposed to continuously.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure based on a seasonal peak count of 3 birds assuming a disturbance distance of 1 km (Table 10-4). This equates to 0.027 birds annually, or 0.036% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 0.7 birds, or 0.9% of the SPA population.

10.4.3.1.3.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The differences between offshore windfarm structures and land-based cranes is provided in Section 10.4.3.1.1.2, providing justification for the caveats in sensitivity of divers to displacement and disturbance from quayside cranes and using offshore wind guidance.

Within 1 km of the Project site, during the breeding season, birds were present on 30% of surveys in 2021 and 37.5% in 2022. A peak count of 4 birds in 2021 represents 5.26% of the population (based on a citation level of 76 breeding pairs) (if all 4 birds were adult birds from different breeding pairs), and 2 birds in 2022 represents 2.6%. These figures for red-throated diver are considered low. Additional flight mapping surveys were undertaken, with a total of 13 birds recorded in 2021 and 54 birds recorded in 2022 (peak count of 19 birds in July).

Birds recorded within 1km of the Project site mainly use the area as a staging area (i.e. flying in and loafing, with occasional foraging before moving further away within the Flow). This is supported by the model used to calculate suitable foraging areas, finding the Project area as being in the lowest category for foraging suitability. Therefore, any displacement of red-throated divers from 1km around the Project site, and when cranes are in operation, would not result in an adverse effect as they utilise more preferable foraging habitat >1km. Hence, impacts from crane disturbance are not considered significant.

The evidence (Dierschke *et al.,* 2017) used to assert that divers are sensitive to towering structures in the marine environment relates primarily to offshore windfarms and provides no evidence that cranes in coastal developments result in the same disturbance/displacement. In the absence of any evidence of divers being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. There is no published evidence of the effect of cranes on red throated diver, however the common presence of red throated diver in harbours during the breeding period (see Section 10.2.1.2 and below) suggests that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project.

The flight path maps for this species (EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report) show that there was at least one pair breeding inland to the east on moorland lochans and that on their outward flights they often alighted within the survey area as their first destination. Flight height

ranged between 20-100m, with the majority of observations between 50-100m. Most observations were out at sea rather than inland.

Red-throated divers are known to be sensitive to disturbance (Table 10-11), including during the chick-rearing period (June to mid-September; NatureScot, 2022b) where access to foraging areas is of particular importance. However, disturbance from vessel activity and limited-noise mobile cranes and large on-vessel crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 8 vessels per month in breeding months. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.3.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including red-throated diver.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the red-throated diver. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the red-throated diver qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.4 Long-tailed duck (non-breeding)

10.4.3.1.4.1 Vessel disturbance

During construction, the number of vessel movements relevant to the long-tailed duck non-breeding period for which they are a qualifying feature (September - April, see Table 10-13) will see an average 0.22% increase of vessel movements over current winter baseline levels, with no increase in vessel movements during March or April. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the long-tailed duck non-breeding period (September-April) are expected to comprise an average monthly increase of 11 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.5% from current baseline levels.

As noted in Section 10.3.2, Project vessels will follow established shipping routes. Maps in Appendix C show the survey data from both the project surveys and HiDef surveys, along with the proposed shipping routes for construction and dredging, and Figure 10-3 shows an analysis of the mean density of long-tailed duck across

Scapa Flow (taken from HiDef survey reporting). As can be seen, the density of long-tailed duck within the main shipping routes is low, and disturbance is considered unlikely.

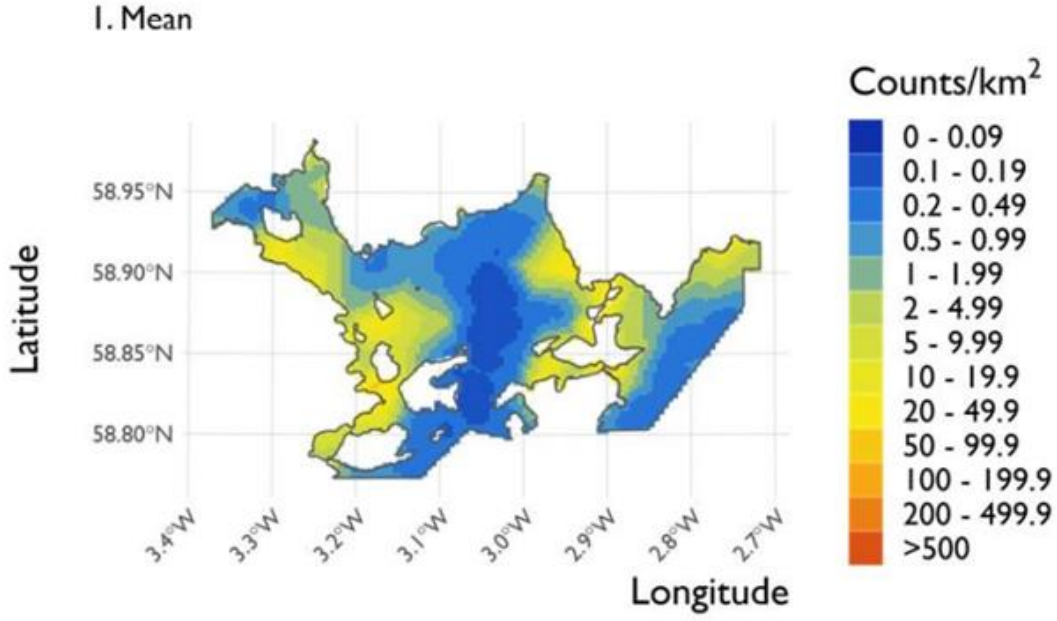


Figure 10-3: Modelled long-tailed duck densities across Scapa Flow SPA (taken from HiDef 2021/22 and 2022/23 wintering bird survey report).

While long-tailed duck display a low sensitivity to vessel disturbance (Table 10-11), there is the potential for increased disturbance during their pre-migration period where they concentrate in larger flocks. However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2).

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts. For long-tailed duck, reference will be made to the pre-migration period of March to May. The Vessel Management Plan will include specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average peak count of 387.6 birds (Table 10-8). This equates to 3.5 birds annually, or 0.69% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 87.2 birds, or 17.3% of the SPA population.

10.4.3.1.4.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60m above quay level (within 1km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Given the infrequent nature of crane usage during the winter months, any disturbance to long-tailed duck from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence (as shown in Table 10-11) and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.4.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including long tailed duck.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the long-tailed duck. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the long-tailed duck qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.5 Eider (non-breeding)

10.4.3.1.5.1 Vessel disturbance

During construction, the number of vessel movements relevant to the eider duck non-breeding period for which they are a qualifying feature (September-March, see Table 10-13) will see an average 0.25% increase of vessel movements over current winter baseline levels, with no increase in March. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and in during the eider duck non-breeding period (September-March) are expected to comprise an average monthly increase of 9 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.4% from current baseline levels.

Eider duck display a high sensitivity to vessel disturbance (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average peak count of 92 birds (Table 10-9). This equates to 0.828 birds annually, or 0.041% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 20.7 birds, or 1% of the SPA population.

10.4.3.1.5.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60m above quay level (within 1km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Eider display a high sensitivity to vessel disturbance (Table 10-11). In the absence of any evidence of waterbirds being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. Whilst there is no published evidence of the effect of cranes on eider duck, the common presence of this species in harbours during the overwinter period (see 10.2.1.5.1) suggests that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project.

Given the infrequent nature of crane usage during the winter months, any disturbance to eider duck from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.5.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement, or reduce access to, preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including eider duck.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is

small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for eider. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the eider duck qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.6 Red-breasted merganser (non-breeding)

10.4.3.1.6.1 Vessel disturbance

During construction, the number of vessel movements relevant to the red-breasted merganser non-breeding period for which they are a qualifying feature (August-March, see Table 10-13) will see an average 0.39% increase of vessel movements over current winter baseline levels, with no increase in March. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the red-breasted merganser non-breeding period (August-March) are expected to comprise an average monthly increase of 11 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.5% from current baseline levels.

Given the paucity of red-breasted merganser in the locality of the proposed Project site, the magnitude of disturbance to this species is expected to be low.

Red-breasted merganser displays a medium sensitivity to vessel disturbance (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2).

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average seasonal peak count of 2.7 birds (Section 10.2.1.6.3). This equates to 0.024 birds annually, or 0.005% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 0.6 birds, or 0.1% of the SPA population.

10.4.3.1.6.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20 m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60 m above quay level (within 1km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Red-breasted merganser are thought to have a moderate sensitivity to disturbance and displacement to vessels (Table 10-11). In the absence of any evidence of waterbirds being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of

disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. There is no published evidence of the effect of cranes on red-breasted merganser.

Given the infrequent nature of crane usage during the winter months, any disturbance to red-breasted merganser from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.6.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including red-breasted merganser.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for red-breasted merganser. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project, it can be concluded that the predicted disturbance impacts on the red-breasted merganser qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.7 Shag (non-breeding)

10.4.3.1.7.1 Vessel disturbance

During construction, the number of vessel movements relevant to the shag non-breeding period for which they are a qualifying feature (September-February, see Table 10-13) will see an average 0.3% increase of vessel movements, over current winter baseline levels. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the shag non-breeding period (September-February) are expected to comprise an average monthly increase of 10 vessel movements from the Project. This constitutes an average increase to monthly vessel movements of 0.4%, from current baseline levels.

European shag display a medium sensitivity to vessel disturbance (Table 10-11) and therefore are not likely to be displaced due to vessel movements. However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2).

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts. The Vessel Management Plan will include specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average seasonal peak count of 61 birds (Section 10.2.1.7.3). This equates to 0.549 birds annually, or 0.019% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 13.7 birds, or 0.5% of the SPA population.

10.4.3.1.7.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60m above quay level (within 1km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Given the infrequent nature of crane usage during the winter months, any disturbance to European shag from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.7.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including European shag.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the European shag. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project, it can be concluded that the predicted disturbance impacts on the European shag qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.1.8 Slavonian grebe (non-breeding)

10.4.3.1.8.1 Vessel disturbance

During construction, the number of vessel movements relevant to the Slavonian grebe non-breeding period for which they are a qualifying feature (August-April, see Table 10-13) will see an average 0.35% increase of vessel movements over current winter baseline levels, with no increase in March or April. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the Slavonian grebe non-breeding period (August-April) are expected to comprise a monthly increase of 13 vessel movements from the Project. This constitutes an average increase to monthly vessel movements of 0.5%%, from current baseline levels.

Slavonian grebe is thought to be moderately sensitive to disturbance through vessel movements (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2).

The potential displacement of a peak of 7 birds represents 5.2% of the SPA population, although it is acknowledged that the wider Scapa Flow area has the capacity to support these birds.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average peak count of 5.67 birds (Table 10-10). This equates to 0.05 birds annually, or 0.038% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 1.3 birds, or 0.9% of the SPA population.

10.4.3.1.8.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20 m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60 m above quay level (within 1 km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Slavonian grebe are thought to have a very high sensitivity to disturbance and displacement to vessels (Table 10-11; Jarrett *et al.*, 2018). In the absence of any evidence of waterbirds being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. During the inshore surveys undertaken in 2017/18, Slavonian grebes showed a strong preference for sheltered, relatively shallow parts of the survey area with only seven birds seen in all the boat-based surveys, suggesting the Scapa Flow is not a preferred foraging habitat for this species.

Given the infrequent nature of crane usage during the winter months, any disturbance to Slavonian grebe from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' minimal presence within the Scapa Flow area and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.4.3.1.8.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including Slavonian grebe.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the Slavonian grebe. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the Slavonian grebe qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.4.3.2 Disturbance to prey species and habitats of prey species (construction only)

As described in NatureScot's Conservation and Management Advice Document for Scapa Flow SPA (NatureScot, 2022b) supporting habitats refer to the characteristics of the seabed and water column relevant to their use by the qualifying features. It relates to wider oceanographic processes such as upwellings, tidal flows, hydrological movements which may be necessary for the habitat, and could affect nutrient cycling and prey distribution.

Hydrodynamic modelling summarised in Section 10.3.2 shows little impact on the surrounding water column and seabed due to the low-energy environment in this part of Scapa Flow. The impacts on prey species for the qualifying species are expected to be negligible, such that their abundance and general distribution remain unchanged from the baseline.

The dredge budget consists of approximately 17% gravel, 60% sand, and 23% silt and clay, which, with the weak tidal currents in the vicinity of the proposed dredge pockets, will result in very localised and short-term plumes from dredging. The magnitude of the sediment discharge and dispersion from dredging works will be low within the dredge area and its immediate vicinity, and negligible out with this area. No sediment transport will occur within the Scapa Flow SPA boundary. Thus, the supporting habitats for qualifying species beyond the development footprint will be maintained.

Drainage designs to ensure that there are no untreated surface water discharges directly to surrounding coastal waters, and the use of silt booms during land reclamation works will mitigate against pollution spills which could affect the qualifying interests of the SPA and their prey sources. In terms of water pollution from the pier and attendant vessels, adherence to strict Pollution Prevention controls will aim to prevent the release of pollutants to the water environment. With these measures in place, the supporting habitats for qualifying species will be maintained.

For dredging disposal at sea, no sediment transport will occur within the Scapa Flow SPA boundary because the sea disposal site is outwith the SPA. Therefore, the supporting habitats for the qualifying SPA species beyond the development footprint will be maintained.

10.4.3.2.1 Great northern diver (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.2 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.3 Black-throated diver (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the black-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.4 Long-tailed duck (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the long-tailed duck qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.5 Eider (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the eider qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.6 Red-breasted merganser (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the red-breasted merganser qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.7 Shag (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the shag qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.2.8 Slavonian grebe (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.4.3.2, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.4.3.3 Accidental release of contaminants or pollutants (all phases)

The Sections below present the conclusion of the assessment of effects on the Scapa Flow SPA qualifying species that have been screened in, based on the Project parameters outlined in Section 10.3.3.

During construction, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments.

The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

An Operational Environmental Management Document will be adhered to throughout the operational phase, and best practice measures will be followed including SEPA Guidance for Pollution Prevention.

10.4.3.3.1 Great northern diver (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.2 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.3 Black-throated diver (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the black-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.4 Long-tailed duck (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the long tailed duck qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.5 Eider (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the eider qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.6 Red-breasted merganser (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the red-breasted merganser qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.7 Shag (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the European shag qualifying feature of the Scapa Flow SPA from the Project alone

as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.3.8 Slavonian grebe (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.4.3.3 above, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the Scapa Flow SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.4.3.4 Ornithological habitat changes (operation and maintenance only)

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA. This equates to 0.06% of the total SPA area which is considered to be a negligible fraction. The affected area is considered to be extremely localised, with the remainder of the SPA continuing to provide extensive foraging, roosting and commuting habitat to the qualifying species.

The habitat functions lost will relate primarily to marine foraging areas used by qualifying bird species. Given the SPA's vast size and heterogeneous habitat availability, the small proportion affected is unlikely to alter the overall ecological functioning of the site.

Scapa Flow provides large expanses of suitable foraging waters with similar depth, prey availability, and hydrodynamic characteristics, therefore the small area lost does not constitute a unique or limiting foraging resource. Mobile seabird species (e.g., divers, grebes, seaduck) typically have wide foraging ranges, enabling them to make use of abundant habitat elsewhere within and beyond the SPA.

Birds commuting between feeding areas, resting locations, and open water are not expected to be impeded; the operational Project footprint will not create a barrier to movement and does not alter the wider connectivity of habitats used by SPA species.

10.4.3.4.1 Great northern diver (non-breeding)

Given the number and distribution of great northern diver within Scapa Flow from the 2017/18 surveys and during the HiDef surveys of 2021/22 and 2022/23, the wider SPA site has the capacity to accommodate great northern divers that utilise the current Project site boundary for foraging.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.2 Red-throated diver (breeding)

During the vantage point surveys and flight surveys undertaken between 2020 and 2022, at least one breeding pair of red-throated divers utilised the site and environs for foraging. Although the Project footprint provides suitable foraging habitat for red-throated diver, the wider SPA site has the capacity to accommodate this pair.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.3 Black-throated diver (non-breeding)

The Project will result in the intermittent disturbance of 167 ha of suitable black-throated diver habitat during operation – i.e. the area branching east off the established route to the Project site that will experience a greater increase in vessel activity (although there are baseline vessel movements in this area – as shown in Appendix A: Heat Maps and HiDef Survey Data). This represents a 4.8% reduction in utilised suitable habitat (3,478 ha –

taken as all areas where Black-throated Divers have been recorded out of 2 km from land). As shown in Appendix A: Heat Maps and HiDef Survey Data, there are several areas where Black-throated Divers have been recorded in double-digit numbers, showing the ephemeral nature of distribution across the Scapa Flow and demonstrating that the Scapa Flow has the capacity to support displaced birds.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the black-throated diver qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.4 Long-tailed duck (non-breeding)

Although the Project footprint provides suitable foraging habitat for long-tailed duck, the wider SPA site has the capacity to accommodate these birds.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the long-tailed duck qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.5 Eider (non-breeding)

Although the Project footprint provides suitable foraging habitat for Eider, the wider SPA site has the capacity to accommodate these birds.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the eider qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.6 Red-breasted merganser (non-breeding)

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA (0.06% of the SPA area). Given that nearly all Red-breasted Merganser are recorded within 500m of the shoreline, this equates to 0.4% of the utilised SPA area. Although the Project site footprint provides suitable foraging habitat for Red-breasted Merganser, the wider SPA site has the capacity to accommodate these birds.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the red-breasted merganser qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.7 Shag (non-breeding)

Although the Project footprint provides suitable foraging habitat for Shag, the findings from the 2017/18 surveys, which show a wide-ranging distribution across Scapa Flow demonstrates that the wider SPA site has the capacity to accommodate these birds (a peak of 73 birds).

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the shag qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.3.4.8 Slavonian grebe (non-breeding)

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA. Given that nearly all Slavonian Grebe are recorded within 500m of the shoreline, and none were recorded in the "Southern Approaches" part of the SPA, this equates to 0.4% of the utilised SPA area. Although the Project site footprint provides suitable foraging habitat for Slavonian Grebes, the 2017/18 survey demonstrates that there was some notable redistribution of birds during the winter period and that the wider SPA site has the capacity to accommodate a peak of 7 birds.

Considering the localised area potentially disturbed or lost during operation of the Project, and the fact that sufficient alternative habitat for foraging and commuting for ornithological individuals outwith the Project site, the habitat change as a result of the Project is considered to be of negligible magnitude.

Considering the assessment outlined in Section 10.3.4 and Section 10.4.3.4 above, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the Scapa Flow SPA from the Project alone as a result of habitat changes would **not adversely affect the integrity of the site**.

10.4.4 Assessment of Adverse Effects In-Combination

Table 10-14 provides a summary of the other developments considered within the in-combination assessment of effects.

10.4.4.1 Disturbance of birds from Project activities

There is the potential for in-combination disturbance from vessels during activities during the construction and/or operational phases of other plans, projects and developments (

Table 10-14). Vessels may pass through the Scapa Flow SPA from other plans and projects that may disturb birds within the SPA.

The majority of vessel movements from other plans and projects will be along established routes (i.e., the main shipping channels in/out of Scapa Flow from the south (between Flotta and South Ronaldsay) and the west (between Hoy/Graemsay and Stromness). Both of these routes experience moderate levels of existing vessel traffic, and the in-combination effect of small numbers of Project vessels will constitute only a minor departure from baseline levels of shipping. The only area that will experience a greater increase in vessel activity will be the 167 ha branching east off the established route, to the Project site, where they are not anticipated to be any other vessels from other plans and developments (although there are baseline vessel movements in this area – as shown in Appendix B: Heat Maps and Noise Contour Maps). Existing fish farms that have undergone variations are required to have seasonal limits and planned vessel routes under site specific advice for the Scapa Flow SPA (NatureScot, 2022b). It is anticipated that vessels will therefore avoid important foraging areas for the qualifying features, mitigating potential impacts.

Construction activities at the Hatston Pier expansion could result in an intermittent disturbance in available habitat for qualifying features of Scapa Flow SPA, however this is anticipated to be localised to the area and affecting a small proportion of the Scapa Flow SPA bird populations which may forage outside of the SPA.

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA); and
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA)

utilising the marine area adjacent to Hatston Pier. Furthermore, it is possible that other Scapa Flow SPA qualifying features (i.e., black-throated diver, long-tailed duck, eider, red-breasted merganser, and shag) may also use the locality of the Hatston proposed development.

It is plausible that individual birds may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to intermittent disturbance within foraging or roosting habitat. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within both Scapa Flow SPA and North Orkney SPA, it is not likely that disturbance to these birds will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

Any potential cumulative disturbance to any of the qualifying features of the Scapa Flow SPA as a result of project activities is deemed to be temporary, with any potential impacts temporary and reversible. Therefore, it can be concluded that the predicted effects on the qualifying features of the Scapa Flow SPA from the Project in-combination with other plans, projects, and development as a result of Project activities would **not adversely affect the integrity of the site**.

10.4.4.2 Disturbance to prey species and habitats of prey species

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to disturbance to prey species and habitats of prey species. Impacts are managed case by case, are rare and highly unlikely. The relevant plans and project which would affect the habitat within and in functionally linked habitat to Scapa Flow SPA include:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;

Construction activities at the Hatston Pier expansion could result in a disturbance to prey species and their habitats, however this is anticipated to be fairly localised to the area and affecting a small proportion of the Scapa Flow SPA.

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA); and
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA)

utilising the marine area adjacent to Hatston Pier. Furthermore, it is possible that other Scapa Flow SPA qualifying features (i.e., black-throated diver, long-tailed duck, eider, red-breasted merganser, and shag) may also use the locality of the Hatston proposed development.

It is plausible that individual birds may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to impacts from disturbance to prey species and habitats. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined habitat for these species within both Scapa Flow SPA and North Orkney SPA, it is not likely that disturbance to prey species and habitats of prey species will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the effect will be negligible. The construction-phase impacts on marine bird prey resources are expected to be short-term, temporary, reversible and recoverable, with any changes remaining transient and confined to a small spatial extent relative to the extensive alternative foraging habitat available to seabirds. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.4.4.3 Accidental release of contaminants or pollutants

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to accidental release of contaminants or pollution. Impacts which are mitigated to negligible levels and are managed case by case, are rare and highly unlikely. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.4.4.4 Ornithological habitat change

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to ornithological habitat change. The relevant plans and project which would affect the habitat within and in functionally linked habitat to Scapa Flow SPA include:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;

Construction activities at the Hatston Pier expansion could result in temporary or permanent habitat change for qualifying features of Scapa Flow SPA, however this is anticipated to be localised to the area and affecting a small proportion of the Scapa Flow SPA bird populations which may forage outside of the SPA (i.e. close to Hatston Pier).

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA); and
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA)

utilising the marine area adjacent to Hatston Pier. Furthermore, it is possible that other Scapa Flow SPA qualifying features (i.e., black-throated diver, long-tailed duck, eider, red-breasted merganser, and shag) may also use the locality of the Hatston proposed development.

It is plausible that individual birds may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to disturbance within foraging or roosting habitat. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within both Scapa Flow SPA and North Orkney SPA, it is not likely that disturbance to these birds will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the ornithological habitat change will be negligible. Considering that the remainder of the SPA is continuing to provide extensive foraging, roosting and commuting habitat to all of the qualifying species, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.4.5 Summary

It is therefore concluded that the potential disturbance effects resulting from the Project, in combination with other plans and projects, will not result in significant barriers to movement, and will not reduce access to preferred foraging, roosting or prey species and habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the cumulative zones of disturbance are small relative to alternative habitat within Scapa Flow SPA and functionally linked habitats. There is no evidence that the areas affected by port operations at the Project, or any other plan or project in combination, are disproportionately important for prey availability for any of the qualifying features of Scapa Flow SPA. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow SPA or functionally-linked habitat, and the likelihood that disturbed or displaced birds will resume foraging elsewhere.

Therefore, there will be no adverse effects on site integrity on any of the qualifying features of the Scapa Flow SPA either for the Project alone or in-combination with other projects, plans and developments.

10.5 North Orkney SPA

10.5.1 Site Description and Qualifying Features

The North Orkney SPA (UK9020314) lies north of Mainland Orkney (NatureScot, 2022c), stretching from Deerness to Eynhallow and incorporating Wide Firth, sheltered bays such as Deer Sound, Inganess Bay and the Bay of Firth, as well as Shapinsay Sound and the tidal channels around Gairsay, Rousay, Egilsay and Wyre, where shallow waters of generally less than 20 metres support mixed sediment habitats, including extensive maerl beds that sustain rich invertebrate communities and in turn attract significant concentrations of wintering and breeding seabirds.

These productive marine conditions regularly support European-important non-breeding populations of great northern diver, Slavonian grebe and velvet scoter, and a nationally important breeding population of red-throated diver. The site covers 211.73 km² and is located 4 km from the Project Site. As per Table 6-6, velvet scoter is screened out of further assessment for the North Orkney SPA.

Table 10-18 Protected feature and condition for the North Orkney SPA (NatureScot, 2022c)

Protected feature	Feature condition	Assessment date	Broader conservation status*
Great northern diver (non-breeding)	Favourable	Not yet assessed	UK: Amber European region: Least Concern
Red-throated diver (breeding)	Favourable	Not yet assessed	UK: Green European region: Least Concern

Slavonian grebe (non-breeding)	Favourable	Not yet assessed	UK: Red European region: Near Threatened
Velvet scoter (non-breeding)	Favourable	Not yet assessed	UK: Red European region: Vulnerable
***UK Broader conservation status based on Birds of Conservation Concern 5 (BoCC5) and European region is based on BirdLife International, 2021.**			

10.5.2 Conservation Objectives

The Conservation Objectives of the North Orkney SPA are:

1. To ensure that the qualifying features of the North Orkney SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of the North Orkney SPA is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

- 2a. The populations of qualifying features are viable components of the site.
- 2b. The distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance of the species.
- 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained.

Supplementary conservation and management advice to support the achievement of the conservation objectives is provided by NatureScot (2022c) and is considered in the assessments below.

10.5.3 Assessment of Adverse Effects Alone

10.5.3.1 Disturbance of birds due to Project activities (all phases)

Although possible, there is no evidence of connectivity between overlapping SPA qualifying features (great northern diver and Slavonian grebe) of Scapa Flow SPA and North Orkney SPA. Survey data does not show flights of great northern diver and Slavonian grebe commuting over Kirkwall between sites (albeit it is acknowledged that Slavonian grebe most likely fly at night). Recent NatureScot responses to developments within North Orkney SPA (Quanterness Fish Farm – NatureScot response dated 21st August 2024 and subsequent email dated 26th March 2025) do not mention connectivity between the two SPA sites, highlighting the uncertainty of this.

For the purposes of this assessment, it is unreasonable to assume that all birds present at Scapa Flow SPA could also be birds as part of the North Orkney SPA, even as a precautionary principle. A more realistic precautionary estimate is that 10% of the birds cross over between North Orkney SPA and Scapa Flow SPA.

Using this criterion, the average seasonal peak count of 46 great northern diver (

Table 10-2) would therefore constitute 4.6 birds associated with North Orkney SPA. This represents 1.5% of the North Orkney SPA population. Similarly, the peak of 5.67 Slavonian grebe (Table 10-10) would constitute 0.567 birds associated with North Orkney SPA, which equates to 0.5% of the SPA population. The average seasonal peak count of 3 red-throated diver (Table 10-4) represents 0.3 birds associated with North Orkney SPA, which equates to 0.6% of the SPA population.

10.5.3.1.1 Great northern diver (non-breeding)

10.5.3.1.1.1 Vessel disturbance

During construction, the number of vessel movements relevant to the great northern diver non-breeding period for which they are a qualifying feature (October-May, see Table 10-13) will see an average 0.12% increase of vessel movements, over current winter baseline levels. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and, during the great northern diver non-breeding period (October-May), are expected to comprise an average monthly increase of 11 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 0.5%, from current baseline levels.

The study undertaken by Jarrett *et al.* (2018) demonstrated that great northern diver do not typically fly in response to vessels, with all evasive methods recorded being a swim away or dive. Given the speeds of vessels within Scapa Flow and that vessels movements for the Project will adhere to a VMP.

As described in Figure 10-2, an analysis of the mean density of great northern diver across Scapa Flow shows that great northern divers are well represented within current shipping lanes, which does suggest a degree of habituation to vessels, contrary to reports that great northern divers are highly sensitive to vessel movements.

During the ornithological surveys undertaken between 2020 and 2022, bird and boat interactions were recorded. For great northern divers, there were 49 observations of interactions with boats. Of these, 24 resulted in no reaction, 10 resulted in birds swimming away slowly, 11 were of birds diving, and three caused an alert (sitting) response. There were no instances of boat movements causing a flight response. This correlates with the findings of Jarrett *et al.* (2021), where at least 95% of reactions to vessels were either no response, slowly swimming away or diving. There were very few instances of vessels causing a flight response.

Despite the evidence from the Gittings, e*t al.* (2015) study mentioned previously, great northern divers are considered display a high sensitivity to vessel disturbance (Table 10-11; Furness *et al.* 2012). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2). It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur every hour (taking the precautionary approach) as opposed to continuously.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

The matrix model assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, based on mean seasonal peak count of 4.6 birds. This equates to 0.0414 birds annually, or 0.013% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 1.035 birds, or 0.34% of the SPA population at designation, over 25 years. This equates to a mortality of one bird over the lifetime of the Project as a result of an increase in 0.12% and 0.5% from current baseline levels in vessel movements during the construction and operational phase, respectively. During the flightless moult period, the mean seasonal peak count is 3.3 birds (i.e. 10% of the Scapa Flow SPA count; Table 10-3), which would equate to a mortality of 0.03 birds annually, or 0.01% of the SPA population. Over 25 years, this would result in a mortality figure of 0.7 birds, or 0.2% of the SPA population.

10.5.3.1.1.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in

summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The differences between offshore windfarm structures and land-based cranes is provided in Section 10.4.3.1.1.2, providing justification for the caveats in sensitivity of divers to displacement and disturbance from quayside cranes and using offshore wind guidance.

Great northern diver are thought to have a high sensitivity to disturbance and displacement from vessels (Table 10-11). In the absence of any evidence of divers being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance when compared with mobile vessels at sea: while they nonetheless present a tall structure which is moving, they move slowly, within confined bounds limited by the crane height and jib length. There is no published evidence of the effect of cranes on great northern diver, however the common presence of great northern diver in harbours during the overwinter period suggests that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project.

Great northern divers are most sensitive during their flightless moult period (February to mid-April; dates provided by NatureScot in correspondence) as during this period they cannot take evasive action by flight. The average peak count of great northern divers during their flightless moult period out to 2 km is 3.3 birds or 1.1% of the SPA citation population. However, as per NatureScot correspondence, it is suitable to use survey data within 0-500 m of the main vantage point to assess disturbance and displacement of great northern diver based on a disturbance distance of 100-300 m as per Goodship and Furness 2022. The average peak count therefore demonstrates that the species does utilise other areas of Scapa Flow successfully, and that the Flow has sufficient capacity to support this species from the North Orkney SPA.

During construction, the number of vessel movements relevant to the great northern diver non-breeding period (October-May) will see an average 0.12% increase of vessel movements, over current baseline levels between October and May. Operational phase vessel movements are expected to comprise an average monthly increase of 11 vessel movements over the same period. This constitutes an average increase to the monthly vessel movements of 0.5%. Given the infrequent nature of crane usage during the winter months (2–5 days/month between October-March) and 8-20 days/month in April and May, any disturbance to great northern divers from vessel activity and crane use is expected to result only in temporary disturbance, particularly during the majority of the flightless moult period, with effects that are intermittent during cargo loading and unloading operations. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated. Based on the very low number of birds from the North Orkney SPA anticipated to be within the Scapa Flow, this impact is considered to be insignificant.

10.5.3.1.1.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds present in the vicinity of the works will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA and the North Orkney SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement, or reduce access to, preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Disturbance distances for great northern diver are 100-350 m (Goodship and Furness, 2022). Table 10-17 shows peak and average counts using the data collected over the 3 years of site surveys between the 0-500m distance band. The peak count of 0.9 birds (Table 10-17) corresponds to a maximum of 0.3% of the SPA population (at the time of citation).

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including great northern diver.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow and the North Orkney SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the great northern diver. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow and the North Orkney SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the great northern diver qualifying feature of the North Orkney SPA from the Project alone would **not adversely affect the integrity of the site**.

10.5.3.1.2 Red-throated diver (breeding)

10.5.3.1.2.1 Vessel disturbance

During construction, the number of vessel movements relevant to the red-throated diver breeding period for which they are a qualifying feature (April-September, see Table 10-13) will see an average 0.58% increase of vessel movements over current summer baseline levels, with no vessel movements predicted for April or May. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and, during the red-throated diver breeding period (April-September), are expected to comprise an average monthly increase of 26 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 1.0% from current baseline levels.

Red-throated diver display a very high sensitivity to vessel disturbance (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2). It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur less than once per day across the construction and operational phase with vessel movements likely to be fewer than twice a week in the winter (taking the precautionary approach) as opposed to continuously.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure based on a seasonal peak count of 0.3 birds assuming a disturbance distance of 1 km (Table 10-4). This equates to 0.0027 birds annually, or 0.006% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 0.07 birds, or 0.14% of the SPA population.

10.5.3.1.2.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The differences between offshore windfarm structures and land-based cranes are provided in Section 10.4.3.1.1.2, providing justification for the caveats in sensitivity of divers to displacement and disturbance from quayside cranes and using offshore wind guidance.

Within 1 km of the Project site, during the breeding season, birds were present on 30% of surveys in 2021 and 37.5% in 2022. A peak count of 4 birds in 2021 represents 5.26% of the population (based on a citation level of 76 breeding pairs) (assuming that all 4 birds were adult birds from different breeding pairs), and 2 birds in 2022 represents 2.6%. These figures for red-throated diver are considered low. Additional flight mapping surveys were undertaken, with a total of 13 birds recorded in 2021 and 54 birds recorded in 2022 (peak count of 19 birds in July).

Birds recorded within 1km of the Project site mainly use the area as a staging area (i.e. flying in and loafing, with occasional foraging before moving further away within the Flow). This is supported by the model used to calculate suitable foraging areas, finding the Project area as being in the lowest category for foraging suitability. Therefore, any displacement of red-throated divers from 1km around the Project site, and in particular when cranes are in operation, would not result in an adverse effect as they utilise more preferable foraging habitat >1km. Hence, impacts from crane disturbance are not considered significant.

The evidence (Dierschke *et al.,* 2017) used to assert that divers are sensitive to towering structures in the marine environment relates primarily to offshore windfarms and provides no evidence that cranes in coastal developments result in the same disturbance/displacement. In the absence of any evidence of divers being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. There is no published evidence of the effect of cranes on red throated diver, however the common presence of red throated diver in harbours during the breeding period (see Section 10.2.1.2 and below) suggests that static vessels, even those with cranes, are not likely to pose a major disturbance impact on individuals of this species foraging close to the Project.

The flight path maps for this species (EIAR Technical Appendix 5.3: Scapa Deep Water Quay Ornithology Technical Report) show that there was at least one pair breeding inland to the east on moorland lochans and that on their outward flights they often alighted within the survey area as their first destination. Flight height ranged between 20-100m, with the majority of observations between 50-100m. Most observations were out at sea rather than inland.

Red-throated divers are known to be sensitive to disturbance (Table 10-11), including during the chick-rearing period (June to mid-September; NatureScot, 2022b) where access to foraging areas is of particular importance. However, disturbance from vessel activity and limited-noise mobile cranes and large on-vessel crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 8 vessels per month in breeding months. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.5.3.1.2.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA and the North Orkney SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including red-throated diver.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow and the North Orkney SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the red-throated diver. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow and the North Orkney SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the red-throated diver qualifying feature of the Scapa Flow SPA from the Project alone would **not adversely affect the integrity of the site**.

10.5.3.1.3 Slavonian grebe (non-breeding)

10.5.3.1.3.1 Vessel disturbance

During construction, the number of vessel movements relevant to the Slavonian grebe non-breeding period for which they are a qualifying feature (August-April, see Table 10-13) will see an average 0.35% increase of vessel movements over current winter baseline levels, with no increase in March or April. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and during the Slavonian grebe non-breeding period (August-April) are expected to comprise a monthly increase of 13 vessel movements from the Project. This constitutes an average increase to monthly vessel movements of 0.5%%, from current baseline levels.

Slavonian grebe is thought to be moderately sensitive to disturbance through vessel movements (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2). The potential displacement of an average seasonal peak count of 0.567 birds represents 0.004% of the SPA population.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

This assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure, considering an average peak count of 0.567 birds. This equates to 0.005 birds annually, or 0.004% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 0.13 birds, or 0.1% of the SPA population.

10.5.3.1.3.2 Mobile cranes

The use of mobile cranes expected for the Project is outlined in Section 5.4 and Section 10.2.3.1. Crane activity at the Project will be intermittent, seasonal, and tied to vessel operations, with markedly higher activity in summer. Movements involve slow, limited-noise mobile cranes and large on-vessel cranes, with operations occurring over 8–20 days/month in summer and 2–5 days/month in winter. Booms can reach 60–125 m in height depending on crane type, but are retracted to ~5 m when stored. Winter operations are minimal due to high wind downtime and daylight-only working, reducing potential disturbance pressure during sensitive winter bird periods.

The landform behind the Project slopes sharply to approximately 20 m higher than the quay level where the cranes will be operating. Against the levels of the land immediately behind this would be 60 m above quay level

(within 1 km of the quay). Therefore, the entirety of all cranes will not be viewed against the skyline but against the surrounding landform.

Slavonian grebe are thought to have a moderate sensitivity to disturbance and displacement to vessels (Table 10-11). In the absence of any evidence of waterbirds being disturbed by quayside cranes, for the purposes of this assessment, the disturbance effect of vessels has been considered as a proxy for disturbance due to cranes, although it should be noted that cranes will operate from a static location on the quay itself, or on vessels berthed (i.e. not moving) at the quay. Both types of crane have a very different mechanism of disturbance to mobile vessels at sea: while they nonetheless present a tall structure which is moving, they typically move slowly, within confined bounds limited by the crane height and jib length. During the inshore surveys undertaken in 2017/18, Slavonian grebes showed a strong preference for sheltered, relatively shallow parts of the survey area with only seven birds seen in all the boat-based surveys, suggesting the Scapa Flow is not a preferred foraging habitat for this species.

Given the infrequent nature of crane usage during the winter months, any disturbance to Slavonian grebe potentially present in the Scapa Flow SPA from vessel activity and crane use is expected to result only in temporary disturbance, with effects that are intermittent during cargo loading and unloading operations and limited further by the very low operational vessel frequency of 0.8 vessels per week in winter. Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' minimal presence within the Scapa Flow area and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.5.3.1.3.3 Airborne noise

Based on the airborne noise modelling (see Section 10.3.1.1.2) which concludes that construction noise levels should be restricted below 70 dB, it is concluded that the main terrestrial works will not result in noise disturbance impacts to waterbirds based on conclusions from University of Hull (2013) and the fact that bunds around the working area will result in construction sound dissipating to <35 dB at 250 m.

It is highly likely that birds will be displaced from the working area (but acknowledging that the wider Scapa Flow SPA and North Orkney SPA has the capacity to accommodate displaced birds), at a sufficient distance that noise disturbance does not cause an impact. Disturbance would only be short-term (during certain periods of construction), temporary (the disturbance will cease once the activity ends), and reversible (the baseline will be restored rapidly following cessation of the activity).

None of these potential disturbance effects will result in barriers to movement or reduce access to preferred foraging and roosting habitats, resulting in a significant energy expenditure and possible reduction in body condition required for survival and subsequent migration.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including Slavonian grebe.

It is concluded that the potential disturbance effects resulting from the Project will not result in significant barriers to movement, and will not reduce access to preferred foraging and roosting habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the disturbance zone is small relative to alternative habitat within Scapa Flow and the North Orkney SPA. There is no evidence that the areas affected by port operations are disproportionately important for prey availability for the Slavonian grebe. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within Scapa Flow and the North Orkney SPA and the likelihood that disturbed birds will resume foraging elsewhere.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project, it can be concluded that the predicted disturbance impacts on the Slavonian grebe qualifying feature of the North Orkney SPA from the Project alone would **not adversely affect the integrity of the site**.

10.5.3.2 Disturbance to prey species and habitats of prey species (construction only)

As described in NatureScot's Conservation and Management Advice Document for North Orkney SPA (NatureScot, 2022c) supporting habitats refer to the characteristics of the seabed and water column relevant to their use by the qualifying features. It relates to wider oceanographic processes such as upwellings, tidal flows,

hydrological movements which may be necessary for the habitat, and could affect nutrient cycling and prey distribution.

Hydrodynamic modelling summarised in Section 10.3.2 shows little impact on the surrounding water column and seabed due to the low-energy environment in this part of Scapa Flow. The impacts on prey species for the qualifying species are expected to be negligible, such that their abundance and general distribution remain unchanged from the baseline.

The dredge budget consists of approximately 17% gravel, 60% sand, and 23% silt and clay, which, with the weak tidal currents in the vicinity of the proposed dredge pockets, will result in very localised and short-term plumes from dredging. The magnitude of the sediment discharge and dispersion from dredging works will be low within the dredge area and its immediate vicinity, and negligible out with this area. No sediment transport will occur within the Hoy SPA boundary. Thus, the supporting habitats for qualifying species beyond the development footprint will be maintained.

Drainage designs to ensure that there are no untreated surface water discharges directly to surrounding coastal waters, and the use of silt booms during land reclamation works will mitigate against pollution spills which could affect the qualifying interests of the SPA and their prey sources. In terms of water pollution from the pier and attendant vessels, adherence to strict Pollution Prevention controls will aim to prevent the release of pollutants to the water environment. With these measures in place, the supporting habitats for qualifying species will be maintained.

For dredging disposal at sea, no sediment transport will occur within the North Orkney SPA boundary because the sea disposal site is outwith the SPA. Therefore, the supporting habitats for the qualifying SPA species beyond the development footprint will be maintained.

10.5.3.2.1 Great northern diver (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.5.3.2, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.5.3.2.2 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.5.3.2, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.5.3.2.3 Slavonian grebe (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.5.3.2, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the North Orkney SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.5.3.2.4 Velvet scoter (non-breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.5.3.2, it can be concluded that the predicted impacts on the velvet scoter qualifying feature of the North Orkney SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.5.3.3 Accidental release of contaminants or pollutants (all phases)

The Sections below present the conclusion of AEOSI on the North Orkney SPA qualifying species that have been screened in, based on the Project parameters outlined in Section 10.3.3.

During construction, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments. The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

An Operational Environmental Management Document will be adhered to throughout the operational phase, and best practice measures will be followed including SEPA Guidance for Pollution Prevention.

10.5.3.3.1 Great northern diver (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.5.3.3 above, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.5.3.3.2 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.5.3.3 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.5.3.3.3 Slavonian grebe (non-breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.5.3.3 above, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.5.3.4 Ornithological habitat changes (operation and maintenance only)

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA, in which qualifying features of North Orkney SPA may be present. This equates to 0.06% of the total SPA area which is considered to be a negligible fraction. The affected area is considered to be extremely localised, with the remainder of the Scapa Flow SPA and North Orkney SPA continuing to provide extensive foraging, roosting and commuting habitat to the qualifying species.

The habitat functions lost will relate primarily to marine foraging areas used by qualifying bird species that may be foraging within the Scapa Flow SPA. Given the Scapa Flow SPA's vast size and heterogeneous habitat availability, as well as the availability of habitat within the North Orkney SPA, the small proportion affected is unlikely to alter the overall ecological functioning of the site.

The Scapa Flow provides large expanses of suitable foraging waters with similar depth, prey availability, and hydrodynamic characteristics, therefore the small area lost does not constitute a unique or limiting foraging resource. Mobile seabird species (e.g., divers, grebes, seaduck) typically have wide foraging ranges, enabling them to make use of abundant habitat elsewhere within and beyond the SPA, including in the North Orkney SPA.

Birds commuting between feeding areas, resting locations, and open water are not expected to be impeded; the operational Project footprint will not create a barrier to movement and does not alter the wider connectivity of habitats used by North Orkney SPA species foraging in the Scapa Flow SPA.

10.5.3.4.1 Great northern diver (non-breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.5.3.4 above, it can be concluded that the predicted impacts on the great northern diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from habitat changes would **not adversely affect the integrity of the site**.

10.5.3.4.2 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.5.3.4 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from habitat changes would **not adversely affect the integrity of the site**.

10.5.3.4.3 Slavonian grebe (non-breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.5.3.4 above, it can be concluded that the predicted impacts on the Slavonian grebe qualifying feature of the North Orkney SPA from the Project alone as a result of impacts from habitat changes would **not adversely affect the integrity of the site**.

10.5.4 Assessment of Adverse Effects In-Combination

Table 10-14 provides a summary of the other developments considered within the in-combination assessment of effects.

10.5.4.1 Disturbance of birds from Project activities

There is the potential for in-combination disturbance from vessels during activities during the construction and/or operational phases of the plans, projects and developments listed in

Table 10-14. Vessels may pass through the North Orkney SPA from other plans and projects that may disturb birds within the SPA. The North Orkney SPA is functionally linked to the Scapa Flow SPA; therefore effects may occur on qualifying species outwith the North Orkney SPA.

The majority of vessel movements from other plans and projects will be along established routes (i.e., the main shipping channels in/out of Scapa Flow from the south (between Flotta and South Ronaldsay) and the west (between Hoy/Graemsay and Stromness). Both of these routes experience moderate levels of existing vessel traffic, and the in-combination effect of small numbers of Project vessels will constitute only a minor departure from baseline levels of shipping. The only area that will experience a greater increase in vessel activity will be the 167 ha branching east off the established route, to the Project site, where they are not anticipated to be any other vessels from other plans and developments (although there are baseline vessel movements in this area – as shown in Appendix B: Heat Maps and Noise Contour Maps). Existing fish farms that have undergone variations are required to have seasonal limits and planned vessel routes to avoid important foraging areas under site specific advice for the North Orkney SPA (NatureScot, 2022c). It is anticipated that vessels will therefore avoid important foraging areas for the qualifying features, mitigating potential impacts.

Construction activities at the Hatston Pier expansion could result in an intermittent disturbance in available habitat for qualifying features of North Orkney SPA, however this is anticipated to be localised to the area and affecting a small proportion of the North Orkney SPA bird populations which may forage outside of the SPA (e.g. within Scapa Flow SPA).

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA);
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA); and
- 38 velvet scoter (25% of the non-breeding population of North Orkney SPA).

Utilising the marine area adjacent to Hatston Pier.

It is plausible that individual birds may use both North Orkney SPA and the locality of the Project for foraging at different times, and therefore could be subject to intermittent disturbance within foraging or roosting habitat. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA (and Scapa Flow SPA), it is not likely that disturbance to these birds will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

Any potential cumulative disturbance to the qualifying features of the North Orkney SPA as a result of project activities are deemed to be temporary, with any potential impacts temporary and reversible. Therefore, it can be concluded that the predicted effects on the qualifying features of the North Orkney SPA from the Project in-combination with other plans, projects, and development as a result of Project activities would **not adversely affect the integrity of the site**.

10.5.4.2 Disturbance to prey species and habitats of prey species

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to disturbance to prey species and habitats of prey species. Impacts are managed case by case, are rare and highly unlikely. The relevant plans and project which would affect the habitat within the North Orkney SPA and in functionally-linked habitat include:

- Backaland Pier, Eday;
- Scammalin Bay Pier;
- Hatston Pier Expansion;
- Eynhallow Sound aquaculture site;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;

- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;
- Bay of Cleat, Westray aquaculture site;
- Wyre aquaculture site;
- Puldrite aquaculture site;
- East of Skelwick Skerry, Westray aquaculture site;
- Vestness, Westray aquaculture site;
- Hunda, Scapa Flow aquaculture site;
- Scarfhall Point, Westray aquaculture site;
- Lober Salmon Farm, Scapa Flow aquaculture site;
- East Moclett, North Sound aquaculture site;
- Bringhead, Scapa Flow aquaculture site;
- Quanterness aquaculture site;
- Veantrow Bay, Shapinsay aquaculture site;
- Chalmers Hope aquaculture site;
- Bay of Cleat (south) aquaculture site;
- Bay of Ham aquaculture site;
- Bay of Vady aquaculture site;
- Kirknoust aquaculture site; and
- Meil Bay aquaculture site.

Construction activities at Backaland Pier and Scammalin Bay Pier could result in a disturbance to prey species and their habitats, however this is anticipated to be localised to the area and affecting a small proportion of the available foraging habitat within the North Orkney SPA and functionally linked habitat.

Construction activities at the Hatston Pier expansion could result in disturbance to prey species and habitats for qualifying features of North Orkney SPA, however this is anticipated to be localised to the area and affecting a small proportion of the habitat of North Orkney SPA bird populations which may forage outside of the SPA (e.g. within Scapa Flow SPA).

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA);
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA); and
- 38 velvet scoter (25% of the non-breeding population of North Orkney SPA).

utilising the marine area adjacent to Hatston Pier.

It is plausible that individual birds may use both North Orkney SPA and the locality of the Project for foraging at different times, and therefore could be subject to disturbance to prey species and habitats. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA (and Scapa Flow SPA), it is not likely that disturbance to a limited area of habitat will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the effect will be negligible. The construction-phase impacts on marine bird prey resources are expected to be short-term, temporary, reversible and recoverable, with any changes remaining transient and confined to a small spatial extent relative to the extensive alternative foraging habitat available to seabirds. Taking into

consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.5.4.3 Accidental release of contaminants or pollutants

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to accidental release of contaminants or pollution. Impacts are managed case by case, are rare and highly unlikely. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.5.4.4 Ornithological habitat change

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to ornithological habitat change. The relevant plans and project which would affect the habitat within the North Orkney SPA and in functionally-linked habitat include:

- Backaland Pier, Eday;
- Scammalin Bay Pier;
- Hatston Pier Expansion;
- Eynhallow Sound aquaculture site;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;
- Bay of Cleat, Westray aquaculture site;
- Wyre aquaculture site;
- Puldrite aquaculture site;
- East of Skelwick Skerry, Westray aquaculture site;
- Vestness, Westray aquaculture site;
- Hunda, Scapa Flow aquaculture site;
- Scarfhall Point, Westray aquaculture site;
- Lober Salmon Farm, Scapa Flow aquaculture site;
- East Moclett, North Sound aquaculture site;
- Bringhead, Scapa Flow aquaculture site;
- Quanterness aquaculture site;
- Veantrow Bay, Shapinsay aquaculture site;
- Chalmers Hope aquaculture site;
- Bay of Cleat (south) aquaculture site;
- Bay of Ham aquaculture site;
- Bay of Vady aquaculture site;
- Kirknoust aquaculture site; and
- Meil Bay aquaculture site.

Construction activities at the Backaland Pier and Scammalin Bay Pier could result in a loss in available foraging habitat, however this is anticipated to be localised to the area and affecting a small proportion of the available foraging habitat within the North Orkney SPA and functionally linked habitat.

Construction activities at the Hatston Pier expansion could result in temporary or permanent habitat change for qualifying features of North Orkney SPA, however this is anticipated to be localised to the area and affecting a small proportion of the North Orkney SPA bird populations which may forage outside of the SPA (e.g. within Scapa Flow SPA).

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of:

- 5 red-throated diver (10.6% of the breeding population of North Orkney SPA);
- 31 great-northern diver (10% of the non-breeding population of North Orkney SPA);
- 10 Slavonian grebe (6% of the non-breeding population of North Orkney SPA); and
- 38 velvet scoter (25% of the non-breeding population of North Orkney SPA).

utilising the marine area adjacent to Hatston Pier.

It is plausible that individual birds may use both North Orkney SPA and the locality of the Project for foraging at different times, and therefore could be subject to disturbance within foraging or roosting habitat. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA (and Scapa Flow SPA), it is not likely that disturbance to these birds will have an adverse effect on site integrity for those bird species for Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the ornithological habitat change will be negligible. Considering that the remainder of the SPA is continuing to provide extensive foraging, roosting and commuting habitat to the qualifying species, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.5.5 Summary

It is therefore concluded that the potential disturbance effects resulting from the Project, in combination with other plans and projects, will not result in significant barriers to movement, and will not reduce access to preferred foraging, roosting or prey species and habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the cumulative zones of disturbance are small relative to alternative habitat within North Orkney SPA and functionally linked habitats. There is no evidence that the areas affected by port operations at the Project, or any other plan or project in combination, are disproportionately important for prey availability for any of the qualifying features of North Orkney SPA. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within North Orkney SPA or functionally-linked habitat, and the likelihood that disturbed or displaced birds will resume foraging elsewhere.

Therefore, there will be no adverse effects on site integrity on any of the qualifying features of the North Orkney SPA either for the Project alone or in-combination with other projects, plans and developments.

10.6 Orkney Mainland Moors SPA

10.6.1 Site Description and Qualifying Features

The Orkney Mainland Moors SPA (UK9002311) comprises a total area of 5,324 ha, (NatureScot, *undated*) and comprises four extensive moorland areas on Mainland Orkney. It is characterised by blanket bog, acid grassland, wet and dry heath, acidic raised-mire and calcareous valley mire, with predominantly acidic conditions but enriched by locally alkaline flushes, while sheltered valleys support willow scrub, tall-herb vegetation and several small oligotrophic lochs. The SPA is designated for supporting populations of European importance of hen harrier—one of Britain's largest and densest breeding populations—as well as red-throated diver and short-eared owl, with the moorland landscape providing essential breeding habitat for these raptors and upland species. While hen harrier and short-eared owl are qualifying features of the Orkney Mainland Moors SPA, they are screened out of further assessment as there was no potential for LSE concluded (Table 6-6).

The SPA was originally classified in 2000 and extended in 2008. The SPA aligns with the boundaries of West Mainland Moorlands, Glims Moss & Durkadale, Orphir & Stenness Hills, and Keelylang & Swartabeck Burn SSSIs.

Table 10-19 Protected feature and condition for the Orkney Mainland Moors SPA (NatureScot, undated)

Protected feature	Feature condition	Assessment date	Broader conservation status*
Red-throated diver (breeding)	Favourable, maintained	Not yet assessed	UK: Green European region: Least Concern
Hen harrier (breeding and non-breeding)	Favourable, maintained	Not yet assessed	UK: Red European region: Vulnerable
Short-eared owl (breeding)	Favourable, maintained	Not yet assessed	UK: Amber European region: Least Concern
***UK Broader conservation status based on Birds of Conservation Concern 5 (BoCC5) and European region is based on BirdLife International, 2021.**			

10.6.2 Conservation Objectives

The Conservation Objectives of the Orkney Mainland Moors SPA are:

1. 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.
2. To ensure for the qualifying species that the following are maintained in the long term:
    - Population of the species is a viable component of the site;
    - Distribution of the species within the site;
    - Distribution and extent of habitats supporting the species;
    - Structure, function and supporting processes of habitats supporting the species;
    - No significant disturbance of the species.

10.6.3 Assessment of Adverse Effects Alone

The breeding population of red-throated diver are the only qualifying species screened into this assessment, as outlined in Section 6.4.

10.6.3.1 Disturbance of birds due to Project activities (all phases)

10.6.3.1.1 Red-throated diver (breeding)

10.6.3.1.1.1 Vessel disturbance

During construction, the number of vessel movements relevant to the red-throated diver breeding period for which they are a qualifying feature (April-September, see Table 10-13) will see an average 0.58% increase of vessel movements over current summer baseline levels, with no vessel movements predicted for April or May. This increase will be temporary over the 26-month construction period.

Operational phase vessel movements are detailed in section 5.4 and 10.3.1.2 and, during the red-throated diver breeding period (April-September), are expected to comprise an average monthly increase of 26 vessel movements from the Project. This constitutes an average increase to the monthly vessel movements of 1.0% from current baseline levels.

Red-throated diver display a very high sensitivity to vessel disturbance (Table 10-11). However, the increase in vessel use along the route to the Project is not considered significant relative to the baseline (see Sections 10.2.3.1 and 10.3.1.2). It is highly unlikely that the movement of vessels in the vicinity of the proposed Project (both during construction and operation) will provide a barrier effect to birds moving through the area, as vessel movements are likely to occur less than once per day in the breeding season (taking the precautionary approach) as opposed to continuously. This constitutes a transient and temporary effect which is unlikely to be discernible from the baseline.

A Vessel Management Plan will be produced, with input from NatureScot, for both the Construction and Operational phases, which will detail vessel routes, speeds, etc., to minimise and, where possible, avoid any disturbance impacts through implementation of specific measures to identify and actively avoid aggregation of birds on the water.

The assessment concludes that the Project will result in a 1% mortality increase annually (Appendix D: Mortality Matrix Model) as a precautionary figure based on a seasonal peak count of 15 birds assuming a disturbance distance of 1 km (Table 10-4). This equates to 0.018 birds annually, or 0.1% of the SPA population. This is not considered significant. Taken over a 25-year operational period (a period agreed with NatureScot), this would result in a mortality figure of 0.45 birds, or 3% of the SPA population. This assumes that all birds from the Orkney Mainland Moors SPA are experiencing disturbance from each vessel.

10.6.3.1.1.2 Mobile cranes

Divers are sensitive to towering structures in the marine environment (Dierschke et al., 2017), however the evidence relates primarily to offshore windfarms and provides no evidence that cranes in coastal developments result in the same disturbance/displacement.

As outlined in Section 10.2.1.2, the bulk of the breeding pairs are located the northern part of the Orkney Mainland Moors SPA. There are no known Orkney Mainland Moors SPA breeding sites within 14 km of the Project site (i.e. beyond the 9 km foraging range for the species, per Woodward *et al.*, 2019) and very few foraging trips from there would be expected towards Scapa Flow. Even with a potential for a larger range of visual disturbance from the towering cranes, it is highly unlikely that red-throated diver from the Orkney Mainland Moors SPA will be present in an area where they are susceptible to disturbance from cranes associated with the Project.

Should disturbance occur, it will be reversible following cessation of crane activities, and given the species' demonstrated tolerance to vessel presence and the implementation of a Vessel Management Plan to minimise interactions, no significant or sustained impact is anticipated.

10.6.3.1.1.3 Airborne noise

As outlined in Section 10.2.1.2, the bulk of the breeding pairs are located the northern part of the Orkney Mainland Moors SPA. There are no known Orkney Mainland Moors SPA breeding sites within 14 km of the Project site (i.e. beyond the 9 km foraging range for the species, per Woodward *et al.*, 2019) and very few foraging trips from there would be expected towards Scapa Flow. Even with a potential for a larger range of visual disturbance from the towering cranes, it is highly unlikely that red-throated diver from the Orkney Mainland Moors SPA will be present in an area where they are susceptible to airborne noise associated with the Project.

Section 7 and Section 10.2.3.4 details mitigation measures to avoid any significant impacts on marine bird species, including red-throated diver.

Based on the evidence outlined above and when considering the mitigation measures committed to by the Project , it can be concluded that the predicted disturbance impacts on the red-throated diver qualifying feature of the Orkney Mainland Moors SPA from the Project alone would **not adversely affect the integrity of the site**.

10.6.3.2 Disturbance to prey species and habitats of prey species (construction only)

Red-throated divers from Orkney Mainland Moors SPA may forage within the Scapa Flow SPA. As described in NatureScot's Conservation and Management Advice Document for Scapa Flow SPA (NatureScot, 2022b) supporting habitats refer to the characteristics of the seabed and water column relevant to their use by the qualifying features. It relates to wider oceanographic processes such as upwellings, tidal flows, hydrological movements which may be necessary for the habitat, and could affect nutrient cycling and prey distribution.

Hydrodynamic modelling summarised in Section 10.3.2 shows little impact on the surrounding water column and seabed due to the low-energy environment in this part of Scapa Flow. The impacts on prey species for the qualifying species are expected to be negligible, such that their abundance and general distribution remain unchanged from the baseline.

The dredge budget consists of approximately 17% gravel, 60% sand, and 23% silt and clay, which, with the weak tidal currents in the vicinity of the proposed dredge pockets, will result in very localised and short-term

plumes from dredging. The magnitude of the sediment discharge and dispersion from dredging works will be low within the dredge area and its immediate vicinity, and negligible out with this area. No sediment transport will occur within the Hoy SPA boundary. Thus, the supporting habitats for qualifying species beyond the development footprint will be maintained.

Drainage designs to ensure that there are no untreated surface water discharges directly to surrounding coastal waters, and the use of silt booms during land reclamation works will mitigate against pollution spills which could affect the qualifying interests of the SPA and their prey sources. In terms of water pollution from the pier and attendant vessels, adherence to strict Pollution Prevention controls will aim to prevent the release of pollutants to the water environment. With these measures in place, the supporting habitats for qualifying species will be maintained.

For dredging disposal at sea, no sediment transport will occur within the functionally-linked Scapa Flow SPA boundary because the sea disposal site is outwith the SPA. Therefore, the supporting habitats for the qualifying SPA species beyond the development footprint will be maintained.

Considering the assessment outlined above and in Section 10.3.2, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Orkney Mainland Moors SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.6.3.3 Accidental release of contaminants or pollutants (all phases)

Red-throated divers from Orkney Mainland Moors SPA may forage within the Scapa Flow SPA and therefore there may be an effect from the accidental release of contaminants or pollutants. During construction, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments. The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

An Operational Environmental Management Document will be adhered to throughout the operational phase, and best practice measures will be followed including SEPA Guidance for Pollution Prevention.

Considering the assessment outlined above and in Section 10.3.3, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Orkney Mainland Moors SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.6.3.4 Ornithological habitat changes (operation and maintenance only)

As outlined in Section 10.2.1.2, the bulk of the breeding pairs are located the northern part of the Orkney Mainland Moors SPA. There are no known Orkney Mainland Moors SPA breeding sites within 14 km of the Project site (i.e. beyond the 9 km foraging range for the species, per Woodward *et al.*, 2019) and very few foraging trips from there would be expected towards Scapa Flow. It is therefore highly unlikely that red-throated diver from the Orkney Mainland Moors SPA will be present in an area where they are susceptible to

ornithological habitat changes associated with the Project. It can therefore be concluded that effects of ornithological habitat changes on the red-throated diver qualifying feature of the Orkney Mainland Moors SPA from the Project alone would **not adversely affect the integrity of the site**.

10.6.4 Assessment of Adverse Effects In-Combination

Table 10-14 provides a summary of the other developments considered within the in-combination assessment of effects.

10.6.4.1 Disturbance of birds from Project activities

There is the potential for in-combination disturbance from vessels during activities during the construction and/or operational phases of the plans, projects and developments listed in

Table 10-14. Vessels may pass through the Scapa Flow SPA from other plans and projects that may disturb birds from the Orkney Mainland Moors SPA.

The majority of vessel movements from other plans and projects will be along established routes (i.e., the main shipping channels in/out of Scapa Flow from the south (between Flotta and South Ronaldsay) and the west (between Hoy/Graemsay and Stromness). Both of these routes experience moderate levels of existing vessel traffic, and the in-combination effect of small numbers of Project vessels will constitute only a minor departure from baseline levels of shipping. The only area that will experience a greater increase in vessel activity will be the 167 ha branching east off the established route, to the Project site, where they are not anticipated to be any other vessels from other plans and developments (although there are baseline vessel movements in this area – as shown in Appendix B: Heat Maps and Noise Contour Maps). Existing fish farms that have undergone variations are required to have seasonal limits and planned vessel routes to avoid important foraging areas under site specific advice for the Scapa Flow SPA (NatureScot, 2022b). It is anticipated that vessels will therefore avoid important foraging areas for the qualifying features, mitigating potential impacts.

Construction activities at the Hatston Pier expansion could result in an intermittent disturbance in available habitat for the red-throated diver feature of Orkney Mainland Moors SPA, however this is anticipated to be localised to the area and affecting a small proportion of the Orkney Mainland Moors SPA population (18 breeding pairs) which may forage either in the Scapa Flow SPA or close to Hatston Pier Expansion.

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of 5 red-throated diver utilising the marine area adjacent to Hatston Pier.

It is plausible that individual red-throated diver may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to disturbance within foraging or roosting habitat. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA and Scapa Flow SPA, based on the breeding foraging range of the red-throated diver (~9 km), it is not likely that disturbance to these birds will have an adverse effect on the species from Hatston alone, nor in combination with the Project.

Any potential cumulative disturbance to the qualifying features of the Orkney Mainland Moors SPA as a result of project activities are deemed to be temporary, with any potential impacts temporary and reversible. Therefore, it can be concluded that the predicted effects on the qualifying features of the Orkney Mainland Moors SPA from the Project in-combination with other plans, projects, and development as a result of Project activities would **not adversely affect the integrity of the site**.

10.6.4.2 Disturbance to prey species and habitats of prey species

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to disturbance to prey species and habitats of prey species. Impacts are managed case by case, are rare and highly unlikely. The relevant plans and project which would affect the habitat within the Scapa Flow SPA used by red-throated diver from the Orkney Mainland Moors SPA include:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;

Construction activities at the Hatston Pier expansion could result in disturbance to prey species and habitats for the red-throated diver feature of Orkney Mainland Moors SPA, however this is anticipated to be localised to the area and affecting a small proportion of the Orkney Mainland Moors SPA population (18 breeding pairs) which may forage either in the Scapa Flow SPA or close to Hatston Pier Expansion.

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of 5 red-throated diver utilising the marine area adjacent to Hatston Pier.

It is plausible that individual red-throated diver may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to disturbance of prey species and habitats. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA and Scapa Flow SPA, based on the breeding foraging range of the red-throated diver (~9 km), it is not likely that disturbance to these birds will have an adverse effect on the species from Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the effect will be negligible. The construction-phase impacts on marine bird prey resources are expected to be short-term, temporary, reversible and recoverable, with any changes remaining transient and confined to a small spatial extent relative to the extensive alternative foraging habitat available to seabirds. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.6.4.3 Accidental release of contaminants or pollutants

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to accidental release of contaminants or pollution. Impacts are managed case by case, are rare and highly unlikely. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.6.4.4 Ornithological habitat change

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to ornithological habitat change. The relevant plans and project which would affect the habitat within the Scapa Flow SPA used by red-throated diver from the Orkney Mainland Moors SPA include:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;

Construction activities at the Hatston Pier expansion could result in temporary or permanent habitat change for the red-throated diver feature of Orkney Mainland Moors SPA, however this is anticipated to be localised to the area and affecting a small proportion of the Orkney Mainland Moors SPA population (18 breeding pairs) which may forage either in the Scapa Flow SPA or close to Hatston Pier Expansion.

The HRA Report for Hatston Pier Expansion reported peak counts from vantage point surveys of 5 red-throated diver utilising the marine area adjacent to Hatston Pier.

It is plausible that individual red-throated diver may use both North Orkney SPA and Scapa Flow SPA for foraging at different times, and therefore could be subject to disturbance of prey species and habitats. However, it is worth noting that Hatston is already an active port in Kirkwall Bay, and given the combined available habitat for these species within North Orkney SPA and Scapa Flow SPA, based on the breeding foraging range of the red-throated diver (~9 km), it is not likely that habitat changes with respect to this species will have an adverse effect on the species from Hatston alone, nor in combination with the Project.

The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the ornithological habitat change will be negligible. Considering that the remainder of the SPA is continuing to

provide extensive foraging, roosting and commuting habitat to the qualifying species, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.6.5 Summary

It is therefore concluded that the potential disturbance effects resulting from the Project, in combination with other plans and projects, will not result in significant barriers to movement, and will not reduce access to preferred foraging, roosting or prey species and habitats in a continuous or sustained manner for red-throated diver. Any distributional changes are likely within the range of natural variability, and the cumulative zones of disturbance are small relative to alternative habitat within the foraging range of the species. There is no evidence that the areas affected by port operations at the Project, or any other plan or project in combination, are disproportionately important for prey availability for the breeding red-throated diver feature of Orkney Mainland Moors SPA. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within the foraging range of red-throated diver, and the likelihood that disturbed or displaced birds will resume foraging elsewhere.

Therefore, there will be no adverse effects on site integrity on the breeding red-throated diver feature of the Orkney Mainland Moors SPA either for the Project alone or in-combination with other projects, plans and developments.

10.7 Hoy SPA

10.7.1 Site Description and Qualifying Features

The Hoy SPA is located on the island of Hoy in Orkney and is located approximately 16.5 km west of the Project site (NatureScot, 2024). Hoy is a mountainous island at the south-western end of the Orkney archipelago. Hoy SPA covers the northern and western two-thirds of Hoy Island, which is formed of Old Red Sandstone and contains Orkney's highest hills, and adjacent coastal waters. The SPA supports an extremely diverse mixture of mire, heath and alpine vegetation and Britain's most northerly native woodland. These upland areas and the high sea cliffs at the coast support an important assemblage of moorland breeding birds and breeding seabirds.

The boundary of Hoy SPA overlaps with that of Hoy SSSI, and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface. The Hoy SPA was classified on 7th December 2000, with marine extension classified on 25th September 2009, due to its populations of breeding seabirds. While peregrine is a qualifying feature of the Hoy SPA, it is screened out of further assessment as there was no potential for LSE concluded (Table 6-6).

Table 10-20 Protected feature and condition for the Hoy SPA (NatureScot, 2024)

Protected feature	Feature condition	Assessment date	Broader conservation status*
Arctic skua (breeding)	Unfavourable, no change	2019	UK: Red European region: Endangered
Atlantic puffin (breeding)	Unfavourable, no change	2017	UK: Red European region: Endangered
Black-legged kittiwake (breeding)	Unfavourable, no change	2017	UK: Red European region: Endangered
Common guillemot (breeding)	Unfavourable, no change	2017	UK: Amber European region: Least concern
Great black backed gull (breeding)	Unfavourable, declining	2023	UK: Red European region: Near threatened
Great skua (breeding)	Unfavourable, declining	2023	UK: Red European region: Least concern
Northern fulmar (breeding)	Unfavourable, no change	2019	UK: Amber European region: Vulnerable

Peregrine (breeding)	Favourable, maintained	2013	UK: Green European region: Least concern
Red-throated diver (breeding)	Favourable, maintained	2007	UK: Green European region: Least concern
***UK Broader conservation status based on Birds of Conservation Concern 5 (BoCC5) and European region is based on BirdLife International, 2021.**			

10.7.2 Conservation Objectives

The Conservation Objectives of the Hoy SPA are:

1. To ensure that the qualifying features of Hoy SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.
2. To ensure that the integrity of Hoy SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

- 2a. The populations of the qualifying features are viable components of the Hoy SPA.
- 2b. The distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance of the species.
- 2c. The supporting habitats and processes relevant to qualifying features and their prey resources are maintained, or where appropriate restored, at Hoy SPA.

10.7.3 Assessment of Adverse Effects Alone

10.7.3.1 Disturbance of birds due to Project activities (all phases)

Disturbance may occur through dredging activities and airborne noise through terrestrial works during the construction phase. Empirical data specifically linking marine bird response to noise disturbance (and underwater noise in particular), separate from other sources of disturbance (e.g. vessel movement or human presence), is limited, and this source of disturbance on marine birds is not yet well understood. Recent research generally suggests that diving seabirds could be more sensitive to underwater noise than previously assumed. For example, hearing thresholds for Great Cormorant were found to be comparable to seals and toothed whales in the frequency band 1 to 4 kHz (Hansen et al., 2017). A number of assessments have been conducted, based on the limited information available, and the similar frequency ranges between seabirds and phocid pinniped and cetacean species, applied methodologies developed for pinnipeds or low-frequency cetaceans in assessing seabird sensitivity to underwater noise (Teachout, 2012). Underwater noise modelling (Technical Appendix 5.6 of the EIAR) for dredging shows a TTS range of up to 250m and a PTS range of 50m or less for prolonged exposure (8 hours).

The Construction activities have been highlighted in the Airborne Noise Report (Technical Appendix 9.1 of the EIAR), and noise contour maps have been prepared (see Appendix B in relation to Scapa Flow SPA qualifying species) as having noise creation levels of between 70 and 90dB at 10m from the source, with noise levels decreasing over distance. With the creation of a 6m bund on the seaward side of the working area, the noise maps demonstrate that noise levels beyond the seaward bund would be between 40-50dB in the immediate vicinity of the bund and dissipate to <35dB at 250m, A study compiled by the IECS, University of Hull (2013) found that construction noise emissions below 50 dB had a low effect and no impact on waterbirds. Disturbance noise above 70 dB resulted in a moderate to high effect on birds, resulting in movement within the feeding zone.

Terrestrial blasting associated with the construction phase could cause disturbance via noise associated with terrestrial blasting. However, routine blasting operations regularly generate air overpressure levels at the closest point to blast area of around 120 dB but the intensity of these noise levels experienced at a distance from the blast site are affected by a range of meteorological conditions (wind speed and direction, temperature, cloud cover and humidity) and in general reduce by 6 dB reduction as the distance from the source doubles, when sound waves pass a given position, the pressure of the air rises very rapidly then falls more slowly then returns to the ambient value after a number of oscillations. This will occur once a week over a 35-week period. The CEMD (Appendix I of the SEIR May 2025) details mitigation measures to avoid any significant impacts on marine bird species. This includes the presence of an ornithologist to monitor for the presence of SPA qualifying species within 500m of the Proposed Development and record behavioural responses within this zone. If impacts are recorded, then the disturbance zone shall be increased.

In terms of potential disturbance from vessel movements, the maximum number of vessel movements is 112 over the 26-month construction phase (see Section 5.3.8 and Section 10.2.3).

10.7.3.1.1 Arctic skua (breeding)

Small numbers of Arctic skua were recorded flying past very infrequently during the summer months, with a peak of five birds in June 2022. The closest known breeding areas are on the East Mainland, ~10km distance, supporting only one or a few pairs at each location. The five birds recorded represents 4.2% of the Hoy SPA population (59 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the Arctic Skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.2 Atlantic puffin (breeding)

This species was recorded on 7 out of 48 watch days during 2020 and 2022, with a peak of 3 birds. It is possible that these birds are from Hoy SPA but the area in the vicinity of the proposed Project site is not considered to be of importance to this species. The peak of three birds represents 0.04% of the Hoy SPA citation population (3,500 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the Atlantic puffin qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.3 Black-legged kittiwake (breeding)

Small numbers were recorded flying past during the summer months, with a peak of 7/hr in June 2022. A peak count of 83 birds on the water within 2 km was also recorded. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 83 birds represents 1.4% of the Hoy SPA citation population (3,000 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the black-legged kittiwake qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.4 Common guillemot (breeding)

Small numbers were recorded, with a peak of 27 birds within 1km of the Project site and 87 within 2 km. Small numbers were also recorded flying past the Project site, with a peak of 6/hr in June 2022. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 87 birds represents 0.3% of the Hoy SPA citation population (13,400 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the common guillemot qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.5 Great black-backed gull (breeding)

A peak of 11 birds were recorded during the summer, and up to 7 birds per hour were recorded flying past at its peak. One pair recorded nesting close to the Project site. It is unlikely that the birds recorded were part of the Hoy SPA complex. The peak of 11 birds represents 0.96% of the Hoy SPA citation population (570 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the great black-backed gull qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.6 Great skua (breeding)

Small numbers, with a peak of 4 birds/hr flying past in July 2021. Numbers in 2022 were significantly lower, probably due to the prevalence of avian flu, which has decimated the local and national populations. The 4 birds/hr represents 0.1% of the Hoy SPA citation population (1,900 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the great skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.7 Northern fulmar (breeding)

Sizable numbers were recorded flying past during the summer months, with a peak of 56/hr in July 2022. It is considered that the vast majority, if not all, birds recorded were from the breeding colony to the north of the Project site. The peak of 56 birds/hr represents 0.08% of the Hoy SPA citation population (35,000 pairs).

Considering the assessment outlined in Section 10.3.1 and Section 10.7.3.1 above, it can be concluded that the predicted impacts on the northern fulmar qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.1.8 Red-throated diver (breeding)

The vessel movements to and from the dredging site will pass through an area that is a favoured foraging area for breeding red-throated diver, which will overlap with the important foraging period during the red-throated diver breeding cycle (June-August), and importantly, the critical chick rearing period.

A total of 42 vessel movements over 12 a week period are anticipated (i.e. 3.5 vessel movements per week), which is not a significant increase in comparison to the baseline vessel movements in the area. Mitigation measures, as outlined in Table 7-1, includes adherence to a Vessel Management Plan which will include measures to minimise and where possible, avoid any disturbance impacts. This includes adherence to slow vessel speeds and staying on defined routes, and adherence to Scottish Marine Wildlife Watching code, in order to minimise the potential for any disturbance. Mitigation measures of standard best practice in relation to navigational protocols and the CEMD will be issued to all vessel operators. Transiting vessels will avoid the marine portion of the Hoy SPA in order to reduce impacts to foraging red-throated diver during this period, as given the proximity to red-throated diver breeding sites on Hoy, it is likely that this is where red-throated divers foraging within the marine portion of Hoy SPA originate.

As per the Hoy SPA Conservation and Management advice (NatureScot, 2024), breeding red-throated divers at Hoy SPA commute between breeding sites on the margins of, or on small islands within, freshwater lochs and lochans, typically in remote upland moorlands (such as the hills of Hoy), to foraging grounds in adjacent coastal waters within 10 km of their nest site. Therefore, vessels passing through or near to the marine portion of Hoy SPA have the potential to disturb breeding red-throated divers. As the vessel route will not enter the SPA, and given that red-throated divers have a strong preference for shallow, coastal areas e.g. bays, and vessels transiting adjacent to the SPA will be following pre-determined routes at constant, slow speeds, there is very limited potential for disturbance to red-throated divers foraging at sea, other than short-duration, temporary and reversible impacts. Divers are sensitive to towering structures in the marine environment (Dierschke *et al*., 2017), however the intervening distance between the Hoy SPA and the Project site is greater than the 9 km foraging range for the species (Woodward *et al*., 2019), therefore there is no possibility for effect from disturbance from cranes.

As such, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Hoy SPA from the Project alone as a result of impacts disturbance of birds due to Project activities would **not adversely affect the integrity of the site**.

10.7.3.2 Disturbance to prey species and habitats of prey species (construction only)

As described in NatureScot's Conservation and Management Advice Document for Hoy SPA (NatureScot, 2024) supporting habitats refer to the characteristics of the seabed and water column relevant to their use by the qualifying features. It relates to wider oceanographic processes such as upwellings, tidal flows, hydrological movements which may be necessary for the habitat, and could affect nutrient cycling and prey distribution.

Hydrodynamic modelling summarised in Section 10.3.2 shows little impact on the surrounding water column and seabed due to the low-energy environment in this part of Scapa Flow. The impacts on prey species for the qualifying species are expected to be negligible, such that their abundance and general distribution remain unchanged from the baseline.

The dredge budget consists of approximately 17% gravel, 60% sand, and 23% silt and clay, which, with the weak tidal currents in the vicinity of the proposed dredge pockets, will result in very localised and short-term

plumes from dredging. The magnitude of the sediment discharge and dispersion from dredging works will be low within the dredge area and its immediate vicinity, and negligible out with this area. No sediment transport will occur within the Hoy SPA boundary. Thus, the supporting habitats for qualifying species beyond the development footprint will be maintained.

Drainage designs to ensure that there are no untreated surface water discharges directly to surrounding coastal waters, and the use of silt booms during land reclamation works will mitigate against pollution spills which could affect the qualifying interests of the SPA and their prey sources. In terms of water pollution from the pier and attendant vessels, adherence to strict Pollution Prevention controls will aim to prevent the release of pollutants to the water environment. With these measures in place, the supporting habitats for qualifying species will be maintained.

For dredging disposal at sea, no sediment transport will occur within the Hoy SPA boundary because the sea disposal site is outwith the SPA. Therefore, the supporting habitats for the qualifying SPA species beyond the development footprint will be maintained.

10.7.3.2.1 Arctic skua (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the Arctic skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.2 Atlantic puffin (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the Atlantic puffin qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.3 Black-legged kittiwake (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the black-legged kittiwake qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.4 Common guillemot (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the common guillemot qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.5 Great black-backed gull (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the great black-backed gull qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.6 Great skua (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the great skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.7 Northern fulmar (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the Northern fulmar qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.2.8 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.2 and Section 10.7.3.2, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Hoy SPA from the Project alone as a result of impacts to prey species would **not adversely affect the integrity of the site**.

10.7.3.3 Accidental release of contaminants or pollutants (all phases)

The Sections below present the conclusion of AEOSI on the Hoy SPA qualifying species that have been screened in, based on the Project parameters outlined in Section 10.3.3.

During construction, there are proposed mitigation measures that will collectively minimise the risk of accidental pollutant release. The CEMD, supported by ECoW oversight, ensures that all activities follow approved methods designed to prevent spills, manage materials safely and maintain compliance with environmental commitments. The Pollution Incident Response Plan provides clear spill-response procedures, emergency contacts and staff training so that any incident is contained quickly and effectively. The Pollution Prevention Plan (which will continue into the operational phase) will include pollution prevention measures that will include measures to deal with accidental spillages in the unlikely event of their occurrence.

Turbidity monitoring, silt booms and controlled dredging protocols help prevent sediment plumes and the mobilisation of contaminated materials, preserving water quality and reducing the risk of pollutants spreading. Ballast Water Management procedures ensure controlled and compliant ballast operations, preventing uncontrolled discharges. Best-practice measures ensure early detection of any environmental change resulting from pollution, allowing prompt corrective action. Together, these integrated controls establish a structured environmental management framework that substantially reduces the likelihood, magnitude and extent of accidental pollutant releases during both construction and operation.

In the unlikely event of a spill, residual pollutants would remain spatially local to the site due to prevailing circulation patterns and established best-practice spill management. In this manner, accidental release of potential contaminants from Project vessels will be strictly controlled and procedures will be in place to minimise the effect of any accidental release if it occurs.

An Operational Environmental Management Document will be adhered to throughout the operational phase, and best practice measures will be followed including SEPA Guidance for Pollution Prevention.

10.7.3.3.1 Arctic skua (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the Arctic skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.2 Atlantic puffin (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the Atlantic puffin qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.3 Black-legged kittiwake (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the black-legged kittiwake qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.4 Common guillemot (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the common guillemot qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.5 Great black-backed gull (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the great black-backed gull qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.6 Great skua (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the great skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.7 Northern fulmar (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the Northern fulmar qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.3.8 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.3 and Section 10.7.3.3 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Hoy SPA from the Project alone as a result of impacts from accidental release of pollutants would **not adversely affect the integrity of the site**.

10.7.3.4 Ornithological habitat changes (operation and maintenance only)

The Project will result in the loss of 19.1 ha of the Scapa Flow SPA, in which qualifying features of Hoy SPA may be present. This equates to 0.06% of the total SPA area which is considered to be a negligible fraction. The affected area is considered to be extremely localised, with the remainder of the Scapa Flow SPA and Hoy SPA continuing to provide extensive foraging, roosting and commuting habitat to the qualifying species.

The habitat functions lost will relate primarily to marine foraging areas used by qualifying bird species that may be foraging within the Scapa Flow SPA. Given the Scapa Flow SPA's vast size and heterogeneous habitat availability, as well as the availability of habitat within the Hoy SPA, the small proportion affected is unlikely to alter the overall ecological functioning of the site.

The Scapa Flow provides large expanses of suitable foraging waters with similar depth, prey availability, and hydrodynamic characteristics, therefore the small area lost does not constitute a unique or limiting foraging resource. Mobile seabird species (e.g., divers, grebes, seaduck) typically have wide foraging ranges, enabling them to make use of abundant habitat elsewhere within and beyond the SPA, including in the Hoy SPA.

Birds commuting between feeding areas, resting locations, and open water are not expected to be impeded; the operational Project footprint will not create a barrier to movement and does not alter the wider connectivity of habitats used by Hoy SPA species foraging in the Scapa Flow SPA.

10.7.3.4.1 Arctic skua (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the Arctic skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.2 Atlantic puffin (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the Atlantic puffin qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.3 Black-legged kittiwake (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the black-legged kittiwake qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.4 Common guillemot (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the common guillemot qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.5 Great black-backed gull (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the great black-backed gull qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.6 Great skua (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the great skua qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.7 Northern fulmar (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the Northern fulmar qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.3.4.8 Red-throated diver (breeding)

Considering the assessment outlined in Section 10.3.4 and Section 10.7.3.4 above, it can be concluded that the predicted impacts on the red-throated diver qualifying feature of the Hoy SPA from the Project alone as a result of impacts from ornithological habitat changes would **not adversely affect the integrity of the site**.

10.7.4 Assessment of Adverse Effects In-Combination

Table 10-14 provides a summary of the other developments considered within the in-combination assessment of effects.

10.7.4.1 Disturbance of birds due to Project activities (all phases)

There is the potential for in-combination disturbance from vessels during activities during the construction and/or operational phases of the plans, projects and developments listed in

Table 10-14. Vessels may pass through or close to the Hoy SPA from other plans and projects that may disturb birds within the SPA.

The seabird qualifying features of the Hoy SPA are not considered sensitive to vessel disturbance due the mobile nature of the species. While there is the potential for birds foraging outside the Hoy SPA to be affected by other vessels, vessel traffic will be occurring in habitat already disturbed by other vessels.

The vessel movements to and from the dredging site will pass through an area that is a favoured foraging area for breeding red-throated diver, however, as discussed in section 10.7.3.1.8, any disturbance will be temporary and short-lived. It is assumed that all vessels for other plans, projects and developments will follow VMPs which also aim to minimise passage of vessels through the marine portion of Hoy SPA, thus avoiding disturbance of foraging red-throated diver during the sensitive breeding period (June-August), when birds will be foraging within the SPA on foraging trips from their Hoy nest sites.

There are no projects that would have the same effect pathway from mobile cranes, therefore there is no potential for an in-combination effect on any of the qualifying features of the SPA as a result of crane operations.

Any potential cumulative disturbance to the qualifying features of the Hoy SPA as a result of project activities are deemed to be short-lived, with any potential impacts temporary and reversible. Therefore, it can be concluded that the predicted effects on the qualifying features of the Hoy SPA from the Project in-combination with other plans, projects, and development as a result of Project activities would **not adversely affect the integrity of the site**.

10.7.4.2 Disturbance to prey species and habitats of prey species (construction only)

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to disturbance to prey species and habitats of prey species. Impacts are managed case by case, are rare and highly unlikely. The relevant plans and project which would have the greatest potential to act in-combination with the Project are the ones located in Scapa Flow SPA, namely:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site;

Construction activities at the Hatston Pier expansion could result in a disturbance to prey species and their habitats, however this is anticipated to be localised to the area and affecting a small proportion of the Scapa Flow SPA. The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the effect will be negligible. The construction-phase impacts on marine bird prey resources are expected to be short-term, temporary, reversible and recoverable, with any changes remaining transient and confined to a small spatial extent relative to the extensive alternative foraging habitat available to birds. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.7.4.3 Accidental release of contaminants or pollutants

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to accidental release of contaminants or pollution. Impacts are managed case by case, are rare and highly unlikely. Taking into consideration the embedded mitigation measures applied to other plans and developments, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.7.4.4 Ornithological habitat change

It was concluded that the project alone would not have an adverse effect on site integrity arising from the Project in relation to ornithological habitat change. The relevant plans and project which would have the greatest potential to act in-combination with the Project are the ones located in Scapa Flow SPA, namely:

- Hatston Pier Expansion;
- Hunda aquaculture site;
- Lober salmon farm;
- Bringhead aquaculture site;
- Westerbister aquaculture site;
- Toyness aquaculture site;
- West Fara aquaculture site.

Construction activities at the Hatston Pier expansion could result in a loss in available foraging habitat, however this is anticipated to be localised to the area and affecting a small proportion of the Scapa Flow SPA. The aquaculture sites are included based on minor changes to existing aquaculture infrastructure, therefore the ornithological habitat change will be negligible. Considering that the remainder of the SPA is continuing to provide extensive foraging, roosting and commuting habitat to the qualifying species, there will be **no adverse effect on site integrity** in-combination with other plans, projects, and development.

10.7.5 Summary

It is therefore concluded that the potential disturbance effects resulting from the Project, in combination with other plans and projects, will not result in significant barriers to movement, and will not reduce access to preferred foraging, roosting or prey species and habitats in a continuous or sustained manner. Any distributional changes are likely within the range of natural variability, and the cumulative zones of disturbance are small relative to alternative habitat within the foraging range of seabird qualifying features of Hoy SPA. There is no evidence that the areas affected by port operations at the Project, or any other plan or project in combination, are disproportionately important for prey availability for any of the qualifying features of Hoy SPA. Any resulting increase in energy expenditure and subsequent reduction in body condition would be short-lived and of a negligible magnitude, given the availability of alternative foraging habitat within the foraging range of the seabird qualifying features of Hoy SPA, and the likelihood that disturbed or displaced birds will resume foraging elsewhere.

Therefore, there will be no adverse effects on site integrity on any of the qualifying features of Hoy SPA either for the Project alone or in-combination with other projects, plans and developments.

11 Conclusions

11.1 Overview

This Report has been prepared to provide the Competent Authorities (the Scottish Government Marine Directorate – Licensing Operations Team (MD-LOT) and Orkney Islands Council (OIC)) with the information necessary to enable them to undertake an Appropriate Assessment (AA) of the Scapa Deep Water Quay Project under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended). It comprises both a Likely Significant Effect (LSE) Screening exercise (Section 6) and the Information to Inform Appropriate Assessment for those European Sites and qualifying features for which LSE could not be excluded (Sections 8 to 10). The assessment considers the Project both alone and in combination with other plans and projects, and has been updated to respond to the requests for Additional Information received to date, including the advice provided by NatureScot on 11 November 2025 and the further information requested by MD-LOT on 15 January 2026. Consultation has also taken place with NatureScot during revision of this HRA (March to June 2026) to ensure it provides all the necessary information.

The responsibility for undertaking the AA, and for reaching the conclusions of that assessment, rests with the Competent Authorities. The conclusions presented in this Report reflect the Applicant's assessment of the available evidence and are provided to support, but not to pre-empt, that determination.

11.2 LSE Screening

The LSE Screening (Section 6) identified the European Sites and qualifying features with connectivity to the Project, and determined for each relevant impact pathway whether the potential for an LSE could be excluded. On the basis of that exercise, six European Sites were taken forward to the Information to Inform Appropriate Assessment stage:

• Loch of Stenness SAC, in respect of its Annex I coastal lagoon feature, limited to the impact pathways associated with the introduction and spread of invasive non-native species (INNS) and the accidental release of pollutants;

- Sanday SAC, in respect of its harbour seal (Phoca vitulina) qualifying feature;
- Scapa Flow SPA, in respect of all of its qualifying ornithological features;
- North Orkney SPA, in respect of its qualifying features with the exception of velvet scoter;
- Orkney Mainland Moors SPA, in respect of its breeding red-throated diver feature only; and
- Hoy SPA, in respect of its breeding seabird features only.

The potential for an LSE was excluded at the Screening stage for European Sites designated for grey seal, harbour porpoise, bottlenose dolphin and otter, on the basis that there is no connectivity between those sites and the Project. European Sites designated for diadromous fish were not considered further, consistent with the advice of MD-LOT and NatureScot regarding the uncertainty in apportioning effects to individual sites. The terrestrial features of the screened-in SPAs (hen harrier and short-eared owl at the Orkney Mainland Moors SPA, and peregrine at the Hoy SPA), the velvet scoter feature of the North Orkney SPA, and the remaining impact pathways at the Loch of Stenness SAC, were likewise screened out for the reasons set out in Table 6-6.

11.3 Information to Inform an Appropriate Assessment

The Information to Inform Appropriate Assessment (Sections 8 to 10) considered the potential for the Project, alone and in combination with other plans and projects, to adversely affect the integrity of each screened-in European Site, having regard to its qualifying features and Conservation Objectives, and taking account of the mitigation measures committed to by the Project (Section 7). These embedded measures include, among others, the Construction Environmental Management Document (and the Biosecurity Plan, Pollution Incident Response Plan, Pollution Prevention Plan and turbidity controls secured through it), the Marine Mammal

Protection Plan and Seal Protection Plan, and the Vessel Management Plans for the construction and operational phases.

On the basis of the assessment presented in this Report, and subject to the implementation of those mitigation measures, it is concluded that the Project, both alone and in combination with other plans, projects and activities, will **not adversely affect the integrity** of Loch of Stenness SAC, Sanday SAC, North Orkney SPA, Orkney Mainland Moors SPA or Hoy SPA, in respect of the qualifying features of each site taken forward to assessment. The site-level conclusions are summarised in Table 11-1.

Table 11-1 Summary of the conclusions of the Information to Inform Appropriate Assessment

European Site	Qualifying feature(s) assessed	Conclusion (alone and in-combination)
Loch of Stenness SAC	Annex I coastal lagoon	No adverse effect on site integrity
Sanday SAC	Harbour seal	No adverse effect on site integrity
Scapa Flow SPA	All qualifying ornithological features	No adverse effect on site integrity (see paragraphs below regarding the outstanding advice of NatureScot in respect of the diver features)
North Orkney SPA	Qualifying features (excluding velvet scoter)	No adverse effect on site integrity
Orkney Mainland Moors SPA	Red-throated diver (breeding)	No adverse effect on site integrity
Hoy SPA	Breeding seabird features	No adverse effect on site integrity

11.4 Scapa Flow SPA and the outstanding advice of NatureScot

For the Scapa Flow SPA, the Applicant's assessment concludes that the Project, alone and in combination with other plans and projects, will not adversely affect the integrity of the site in respect of any of its qualifying ornithological features. This conclusion is reached with the benefit of the additional information now provided, including the assessment of disturbance and displacement arising from the operation of mobile and vessel-mounted cranes, which has been extended to the black-throated diver, great northern diver and red-throated diver features in response to NatureScot's advice, together with the expanded in-combination assessment.

It is acknowledged that, in its advice of 11 November 2025, NatureScot was unable to conclude no adverse effect on the integrity of the Scapa Flow SPA in respect of the black-throated diver feature, on the basis of the potential disturbance and displacement associated with crane operations, and considered that this effect could not be fully mitigated. NatureScot was likewise unable, at that time, to conclude no adverse effect for the great northern diver and red-throated diver features of the Scapa Flow SPA, and for the relevant features of the North Orkney and Orkney Mainland Moors SPAs, pending the assessment of crane operations now provided. This Report has been prepared to address those matters and to provide the Competent Authorities with the further information necessary to inform their determination.

Consultation with NatureScot during preparation of the revised HRA Report (letter dated 30th June 2026) has confirmed that they agree with the conclusion of no AEoSI for North Orkney SPA, Orkney Mainland Moors SPA and Hoy SPA. However, with regards to Scapa Flow SPA NatureScot consider '*the development and associated operations will undermine Conservation Objective 2b [The distribution of the qualifying features is maintained throughout the site by avoiding significant disturbance of the species] and therefore lead to AEoSI for black-throated-diver'*.

11.5 Overall conclusion and next steps

Subject to the implementation of the mitigation measures set out in Section 7, the Applicant's assessment is that the Project will not adversely affect the integrity of any of the six European Sites taken forward to Appropriate Assessment, whether alone or in combination with other plans, projects and activities. On this basis, the Applicant does not consider a need for the further stages of the HRA process: the assessment of alternative solutions and of imperative reasons of overriding public interest (IROPI), and the identification of compensatory measures.

The Competent Authorities (MD-LOT and OIC) remain responsible for undertaking the Appropriate Assessment and for reaching a conclusion on site integrity. Should the Competent Authorities, having regard to the advice of NatureScot, be unable to ascertain that the Project will not adversely affect the integrity of a European Site, for example in respect of the black-throated diver feature of the Scapa Flow SPA, the subsequent stages of the Habitats Regulations process would need to be considered in relation to the affected feature.

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Appendix A: Heat Maps and HiDef Survey Data

Appendix B: Bird Heat Maps and Noise Contour Maps

Appendix C: Bird Heat Maps and HiDef Data Combined with Construction Vessel Routes

Appendix D: Mortality Matrix Model

Appendix E: Long List of In-Combination Projects