



## Appendix F

RIAA

On behalf of



**Shetland  
Islands  
Council**

Project Ref:332511168| Rev: A | Date: March 2023

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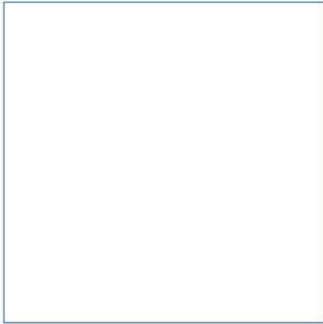
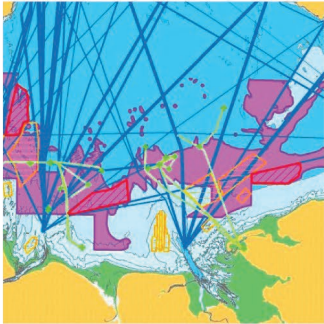
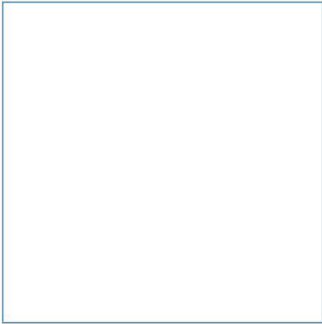
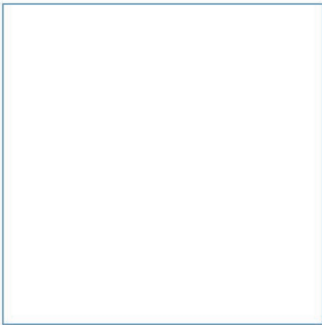
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Stantec

# Fair Isle to Grutness Ferry Upgrade

Report to Inform Appropriate Assessment for Pier Improvement Works at Grutness, Shetland

March 2023



Innovative Thinking - Sustainable Solutions



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# 1 Introduction

## 1.1 Background

Fair Isle is the United Kingdom’s most remote community, lying 24 miles off the southern tip of the Shetland Islands. The island is separated from Shetland mainland by a body of water known as the ‘Roost’, which has a reputation of being one of the most demanding stretches of water in the UK, and indeed Europe. This means that the island is not just geographically remote but is also remote from a connectivity perspective – indeed, the island had no transport connections on 221 days in 2017.

The island is within the Shetland Islands Council (SIC) administrative area and is connected to mainland Shetland by two lifeline transport links. The main passenger link is through an air service by means of an eight seat Britten-Norman BN-2 Islander aircraft. The existing ferry service provides the critically important supply chain and freight link as well as capacity for 12 passengers per sailing.

SIC is progressing the Fair Isle Ferry Upgrade Project (‘the Project’) to replace the existing vessel, which is approaching the end of its life and does not meet modern standards, together with ferry infrastructure at both berthing sites at North Haven, Fair Isle and at Grutness, Sumburgh Head.

The Fair Isle and Grutness sites are both located within environmental designations including Special Protection Areas (SPA) and a Special Area of Conservation (SAC) (North Haven, Fair Isle). **This report covers the geographically distinct project activities which are proposed at Grutness, Shetland.** A separate Report to Inform Appropriate Assessment (RIAA) has been prepared in respect of the proposed works at Fair Isle.

## 1.2 Initial Screening

Initial screening of the Project, with respect to its potential to have Likely Significant Effects (LSE) on European and Ramsar designated sites, was carried out in the ‘Fair Isle Ferry Upgrade HRA screening for Grutness Pier Improvement Works’ screening report (ABPmer, 2022).

The screening report was submitted to Marine Scotland-Licensing and Operations Team (MS-LOT) and NatureScot in November 2022. The initial screening process concluded that the following sites and their qualifying features would be taken forward for assessment within the RIAA (Table 1).

Table 1. Summary of potential effects to qualifying features screened into HRA

Site	Distance from Project	Qualifying Features Screened In	Potential Effects
<b>Sumburgh Head SPA</b>	Footprint	Arctic tern Fulmar Guillemot Kittiwake	Damage/Loss of supporting habitat Underwater noise disturbance and displacement Airborne noise disturbance and displacement Visual disturbance and displacement Accidental pollution of supporting habitat Changes to prey availability

			Increase in water turbidity
<b>Mousa SPA</b>	14 km	Arctic Tern	Underwater noise disturbance and displacement Airborne noise disturbance and displacement Visual disturbance and displacement Changes to prey availability Increase in water turbidity from sediment plumes
<b>Mousa SAC</b>	13 km	Common Seal	Disturbance at seal haul out sites Disturbance from underwater noise Physical damage from underwater noise

A secondary screening stage was progressed within the RIAA (below) in light of additional information available on the proposal and further consideration of the potential for LSE on qualifying features of designated sites.

### 1.3 In-combination

The Habitats Regulations require that the potential effects of a project on designated sites are considered both alone and in-combination with other plans or projects.

Current understanding indicates that there are no other marine or terrestrial projects currently planned or recently completed that have the potential to contribute to in-combination effects, with the Project, on the qualifying features of designated sites (ABPmer, 2022).

### 1.4 Appropriate Assessment

From this point onward, the information (RIAA) has been presented in a *proforma* following the linear steps of the Appropriate Assessment (AA) stage of a Habitats Regulations Appraisal (HRA). Figure 1 shows the Grutness proposal location with designated sites which overlap or are adjacent to the proposal.



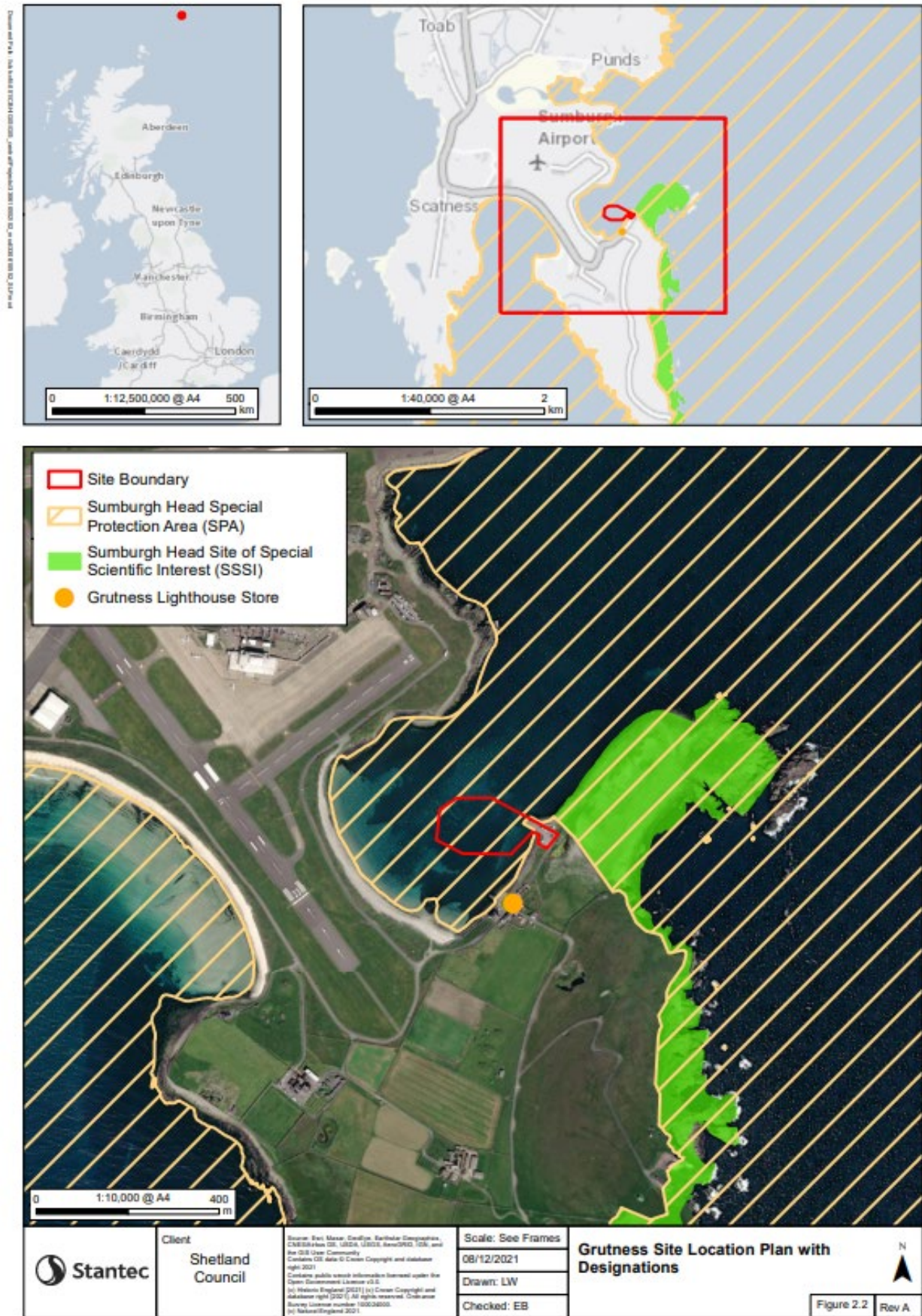


Figure 1: Grutness proposal and overlapping or adjacent designated sites



## Habitats Regulations Appraisal

### APPRAISAL IN RELATION TO REGULATION 48 OF THE CONSERVATION (NATURAL HABITATS, &C.) REGULATIONS 1994 AS AMENDED<sup>1</sup> (HABITATS REGULATIONS APPRAISAL)

#### NATURA SITE DETAILS

##### Name of Natura site(s) potentially affected:

1. Sumburgh Head SPA (UK9002511)
2. Mousa SPA (UK9002361)
3. Mousa SAC (UK0012711)

##### Name of component SSSI if relevant:

###### Sumburgh Head SPA

- Sumburgh Head Site of Special Scientific Interest (SSSI)

##### Natura qualifying interest(s) & whether priority/non-priority (features in bold indicate those where a potential for LSE was initially identified (see ABPmer, 2022):

###### 1. Sumburgh Head SPA:

**Arctic tern (*Sterna paradisaea*)**  
**Fulmar (*Fulmarus glacialis*)\***  
**Guillemot (*Uria aalge*)\***  
**Kittiwake (*Rissa tridactyla*)\***

Seabird assemblage

**\*Indicates assemblage qualifier only**

None of the qualifying interest features have priority status within the meaning of the Habitats Regulations, in Scotland.

###### 2. Mousa SPA:

**Arctic tern (*Sterna paradisaea*)**  
European Storm Petrel *Hydrobates pelagicus*

###### 3. Mousa SAC

Reefs  
Submerged or partially submerged sea caves  
**Harbour/Common seal**

##### Conservation objectives for qualifying interests:

###### 1. Sumburgh Head SPA

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

<sup>1</sup> Or, where relevant, under regulation 61 of The Conservation of Habitats and Species Regulations 2010 as amended, or regulation 25 of The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 as amended.

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

## 2. **Mousa SPA**

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

## 3. **Mousa SAC**

The conservation objectives for the qualifying habitats **Reefs** and **Submerged or partially submerged sea caves** are:

To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying habitats that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

The conservation objectives for the qualifying species **Harbour/Common Seal** are:

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within 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



## STEP 1: WHAT IS THE PLAN OR PROJECT?

### Proposal title:

Fair Isle Ferry Upgrade (Grutness, Shetland)

### Name of consultee:

NatureScot

### Name of competent authority:

Marine Scotland; SIC

### Details of proposal (inc. location, timing, methods):

The site (Grutness ferry terminal) is located near Sumburgh Head on the southern tip of the Shetland Mainland, opposite Sumburgh Airport. The pier is generally sheltered from the south and west by land. However, the pier is very exposed from the east through to the north-east (see Figure 1).

The proposal is to replace the existing vessel, which will also result in the berthing site at Grutness being upgraded to facilitate the new ferry and an enhancement to the existing ferry terminal. The details of the works required are described below and the proposal outlined in Figure 2 and Figure 3 below:

- An extension to the existing pier (sheet piled structure) and rock armour protection in a 'dog-leg' shape to provide shelter for a new linkspan structure (steel deck with concrete supports and bankseat) that will be used by the new roll on – roll off (Ro-Ro) vessel;
- An increase to the height of the existing rock armour to the north of the pier to reduce the frequency and severity of swell overtopping during storm events;
- Dredging to provide a sufficient water depth for new vessel around the proposed pier extension and linkspan; and
- Improved marshalling facilities.

It is expected that 328 sheet piles will be required to construct the extension to the pier. While there will likely be a mix of impact and vibro piling, as a worst-case it is assumed that impact piling will be required throughout. Piling activities will be intermittent allowing 4 days of piling per pre-fabricated section (cell) of the pier, followed by 12 days of non-piling activities to complete that cell and move on to the next (3 days to install waling beams, 2 days to install tie rods, 3 days to backfill, 4 days to set up temporary works for next cell).

Piling activity will be carried out for a maximum of 10 hours per day (between 07:00 and 19:00) for 4 days, followed by 12 days of non-piling activities, repeated for 10 cells. The proposed methodology is to install piles "end over" using land-based piling plant sitting on the end of the existing pier. As each cell is completed and backfilled, the plant can move onto the cell and construct the next. It is estimated that piling activities will take a maximum of 6 months, between April and September. While it is assumed that piling would be carried out from the land side (on pier), if the contractor prefers to use a barge mounted piling rig, the total duration of piling will be approximately 3 months. However, as a worst-case option, the RIAA assumes that piling activities would be 6 months.

The maximum size of the area to be dredged at Grutness is approximately 12,000 m<sup>2</sup> (this includes transition slopes between the dredge pocket and the existing seabed). The final dredged depth will be based on the vessel draught and is unlikely to exceed 4.5 m below chart datum (BCD). These represent worst-case scenarios. Furthermore, the vessel design will look to minimise an increase in draught to avoid dredging where possible.

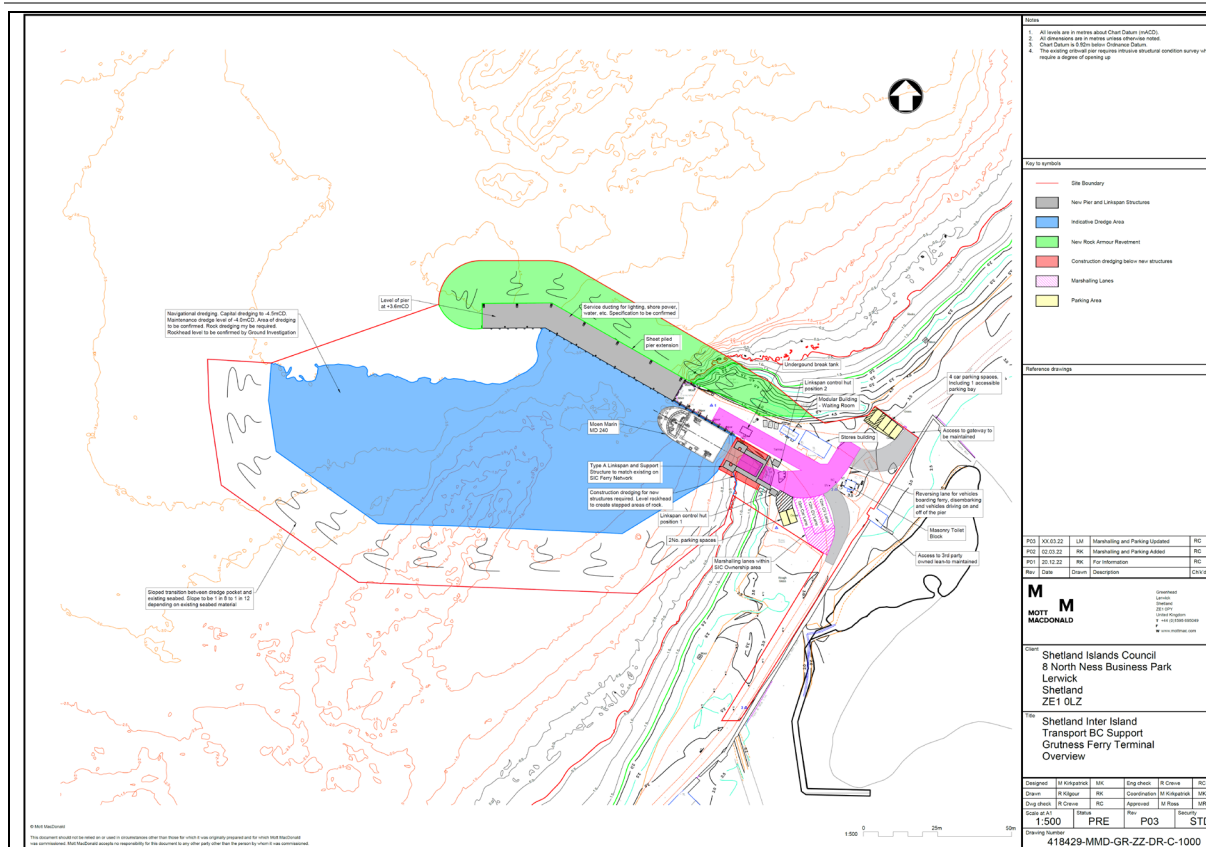
Dredging activity will be carried out for a maximum of 10 hrs per day (between 07:00 and 19:00) using up to two barges working simultaneously. Allowing for weather downtime the maximum duration of dredging activities would be 7 months, between April and October, acknowledging that this would not be continuous dredging operations. It is estimated that the dredged volume of material will not exceed 16500 m<sup>3</sup>. It is currently anticipated that dredged material will be removed by a combination of backhoe dredger (for soft material) and excavator for rock and transported by barge to a licensed offshore disposal site (Scalloway (FI095)). There may also be a requirement to inject rock with liquid CO<sub>2</sub> (Cardox) and then 'pecker' to remove rock material.

While there is potential for the dredging activity to happen concurrent with the piling activity over a single year, for bird receptors (i.e. Arctic Tern and Fulmar) a worst-case scenario has been assumed i.e., that these activities will take place in separate years (piling-2024; dredging-2025) as this would result in an increased potential for disturbance/displacement effects. However, for marine mammal receptors (i.e. harbour seal) consideration is given to both scenarios (piling and dredging occurring in a single year and in separate years) and their potential for disturbance/displacement effects from underwater noise and presence.

Rock armour will be placed on the existing breakwater and also alongside the pier to create a new breakwater along the northern edge of the pier. Rock armour for the breakwater may be delivered by vessel, or could be brought by road if this is sourced from a local quarry. A crane will be used to place each individual rock for the armouring. The rock armouring activity will take place in 2024 and therefore is anticipated to coincide with the piling works and pier extension, with the potential to also coincide with dredging.



**Figure 2. Indicative boundaries of marine works (in green) (1.44 ha) and land based works (in red) (0.21 ha)**



**Figure 3. Details of construction activities for proposed jetty upgrade**

As it is yet to be determined how much of the work will be carried out from sea and the likely requirements for vessel movements, a worst-case scenario has been adopted which assumes the following for marine based vessel activity:

**2024**

- Barge mounted piling rig (on site for 3 months)
- Vessel movement for delivery of materials/equipment/plant (maximum, on average, two vessels per week from February to October)
- Two dredgers (on site for 7 months) (assuming dredging runs concurrently)

**2025**

- Two dredgers (on site for 7 months)
- Vessel movement for delivery of materials/equipment/plant (maximum, on average, two vessels per week from March to September)

Although a detailed construction methodology is yet to be determined, it is reasonable to assume that in addition to the marine works outlined above, the construction is likely to utilise lorries and plant associated with road construction including material deliveries and removal, road pavers and rollers, excavators, dozers and dump trucks. The precise nature and quantity of plant employed during construction will vary with each stage of the project.

**Construction programme**

The current indicative programme proposed is:

- Contractor mobilising - February / March 2024;
- Construction Phase 1 (pier extension and piling) April to October 2024; and
- Construction Phase 2 (linkspan installation, dredging and surfacing of marshalling area) April to September 2025.



Construction is expected to take place Monday to Friday 07.00 to 19.00 and Saturday 07.00 to 13.00, with no working on Sundays or Bank Holidays. The workforce will arrive ~15 minutes before shift start and leave ~15 minutes after shift finish.

By exception some construction activities may need to be undertaken outside these hours, for which agreement would be sought from SIC and MS-LOT.

During this period there will be a combination of Heavy Goods Vehicles (HGVs) for the component deliveries and Light Goods Vehicles (LGVs) for construction staff. Material/component delivery times will be limited to between 08:00 and 17:00 Mon to Fri and 08:00 to 12:00 Saturday.

Outside of these times, works will be limited to those required in an emergency where there is the potential of harm or damage to personnel, plant, equipment or the environment, provided the Principal Contractor (yet to be appointed) retrospectively notifies of such works within 24 hours of their occurrence.

A range of good practice and management measures will be adopted by the successful contractor to minimise the potential for environmental effects and any disruption that could be caused by the construction works. These will include:

- The site supervisor will give toolbox talks prior to work commencing. These talks will highlight any sensitive features, including the designated sites (SPA and SSSI) and qualifying features.
- In line with good practice, the contractor will follow the updated and relevant Guidance for Pollution Prevention (GPPs) including GPP 5 (Works and maintenance in or near water). Pollution Prevention Guidance (PPGs) will be followed if no corresponding GPP is available.
- Oils, fuels and chemicals will be stored in fully bunded areas.
- Spill kits will be available on site and workers trained in their use.
- The contractor will produce a contingency plan for dealing with spills or environmental incidents.
- Any waste generated will be removed from site and either recycled or disposed of in compliance with Waste Management Regulations.
- The successful Contractor will ensure vessels and plant involved in the operational activities for the works adhere to the industry recommended guidelines for preventing the introduction of Invasive Non-Native Species (INNS).
- Prior to and during construction activities, appropriate staff will be informed of relevant marine and terrestrial INNS. These staff will also be cognisant of guidance produced by NatureScot for the prevention of introduction of non-native species (Cook *et al.*, 2014) and draft guidance on biosecurity for the Outer Islands (RSPB, 2021).
- The Contractor will produce a Ballast Water Management Plan<sup>2</sup> (if relevant) to prevent the risk of introducing invasive non-native species into Grutness.
- Prior to use, all equipment will be washed and cleaned to ensure that no contaminants are brought into contact with the marine or terrestrial environment.
- Vehicle numbers and movement on the vegetation will be kept to a minimum.
- Vessels used for the works will adhere to the general principles in the Scottish Marine Wildlife Watching Code.
- The Contractor will contact the Sumburgh Head RSPB warden prior to works commencing in each year and inform the warden once works have finished in each year

## STEP 2: IS THE PLAN OR PROJECT DIRECTLY CONNECTED WITH OR NECESSARY TO SITE MANAGEMENT FOR NATURE CONSERVATION?

No, none of the activities are directly connected with or necessary to site management for nature conservation.

<sup>2</sup> <http://www.imo.org/en/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx>

### STEP 3: IS THE PLAN OR PROJECT (EITHER ALONE OR IN COMBINATION WITH OTHER PLANS OR PROJECTS) LIKELY TO HAVE A SIGNIFICANT EFFECT ON THE SITE?

The initial screening process indicated the potential for a Likely Significant Effect (LSE) from the proposal on the following qualifying features of Sumburgh Head SPA, Mousa SPA and Mousa SAC (ABPmer, 2022). Specifically:

- **Sumburgh Head SPA** – *Arctic Tern, Fulmar, Kittiwake, Guillemot, Seabird assemblage*
- **Mousa SPA** – *Arctic Tern*
- **Mousa SAC** – *Common/Harbour Seal*

The screening report (ABPmer, 2022) was submitted to NatureScot and MS-LOT in November 2022. In December 2022 a response from NatureScot (Juan Brown, 6 December 2022) confirmed being broadly content with the outputs from the Grutness screening report.

However, since the screening report was provided, additional information has been made available on the best practice and management measures which will be adopted by the successful contractor (see above). Consideration of these measures and further review of the designated features has been acknowledged within Step 3 as it is relevant to determination of adverse effect on site integrity.

Since the screening report was produced it has also been confirmed that it is the intention to dispose dredged material offshore. It is proposed that dredged material will be deposited at the nearest licensed open disposal site (Scalloway (FI095)). The maximum volume of the dredge material proposed to be deposited (16500 m<sup>3</sup>) would represent a very small proportion of the annual dredge deposits received at the Scalloway disposal site. Scalloway is situated approximately 38 km to the northwest of Grutness and is greater than 10 km overland from the nearest SPAs (East Mainland Coast Shetland; Noss) and more than 30 km by sea from the nearest marine SAC (Papa Stour). Several barge movements may be required to take the material to the disposal site. Given that the disposal site is operational and regularly receives dredged material, is not located within or near to any European/Ramsar site and that vessel movements would be occurring within an already relatively busy area for shipping traffic it is concluded that the addition of this activity (offshore disposal) would not result in any additional qualifying featured or designated sites being screened in.

#### **Sumburgh Head SPA**

The boundary of the proposal overlaps with Sumburgh Head SPA.

The effects associated with the proposed works with potential for LSE on the qualifying features progressed to this stage of the HRA are provided in Table 1

Detail has been provided on the good practice and management measures that will be adopted by the successful contractor (see Step 1); these include measures to prevent loss of materials and/or pollutants from entering the marine environment or impacting the terrestrial environment; and measures to prevent introduction of INNS. With implementation of these good practice and management measures it is concluded that there would be no potential for LSE from pollution on habitats of the qualifying species or the qualifying species themselves. Hence, the effect of accidental pollution on supporting habitat is not considered further.

The construction works will overlap with the breeding season of the qualifying bird features in 2024 and 2025. No breeding colonies of Guillemot and Kittiwake are visible from the proposal site. The nearest colonies of these species are located along the coastal exposed cliffs to the south of the bay, at Compass Head. Breeding Fulmar are located at the disused quarry approximately 300 m from the proposal, with occasional ground-nesting Fulmar in the local vicinity. However, there is an Arctic Tern colony in the boulder field less than 150 m from the existing pier.

Consideration is given to the distance and lack of visibility of the proposal from the nearest breeding colonies of Kittiwake and Guillemot (Compass Head) and the presence of hills between the works area and the nesting cliffs which will act to attenuate any noise generated. Furthermore, as pelagic species, Kittiwake and Guillemot typically forage offshore, away from the coast and the bay at Grutness. Given the good practice and management measures to be adopted by the successful contractor to reduce the risks of pollution (see Step 1) and the low likelihood of noise and disturbance interfering with the core feeding areas of these species; in addition to, Kittiwake and Guillemot foraging behaviour, their very large foraging range and the availability of prey, it is considered there would be no potential for LSE on populations of these species (which also contribute to form the seabird assemblage qualifier). Given the proximity of nesting Arctic Tern and Fulmar to the proposal, it is concluded that there **is potential for an LSE** on the Arctic Tern colony present at the boulder field, to the east of the proposal, as well as on breeding Fulmar.

#### **In-combination effects**

There are no other marine or terrestrial projects currently planned or recently completed that have the potential to contribute to in-combination effects on the qualifying features of the SPA with the proposal.

#### **Mousa SPA**

The boundary of the proposal is approximately 14 km from Mousa SPA.

It has already been accepted that there is no credible mechanism which could lead to a potential for LSE on pelagic foraging European Storm Petrel which breed within Mousa SPA (ABPmer, 2022). This species are extremely wide-ranging and forage in offshore environments. Thus, they would not overlap with the inshore proposal at Grutness bay.

The effects associated with the proposed works with potential for LSE on the qualifying feature (Arctic Tern) of this SPA, as progressed to this stage of the HRA, are:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Changes to prey availability
- Increase in water turbidity from sediment plumes

Given that there will be a reasonable degree of connectivity between the colony at Mousa and the colony located at Grutness boulder fields, it is concluded that there **is potential for an LSE** on the Arctic Tern from Mousa SPA.

#### **In-combination effects**

There are no other marine or terrestrial projects currently planned or recently completed that have the potential to contribute to in-combination effects on this qualifying feature of the SPA with the proposal.

#### **Mousa SAC**

The boundary of the proposal is approximately 13 km from Mousa SAC.

It has already been established that there is no credible mechanism which could lead to a potential for LSE on the benthic habitat qualifying features of this site (i.e. 'Reefs' and 'Submerged or partially submerged sea caves') (ABPmer, 2022).



Within the screening exercise, potential effects could not be ruled out on the common/harbour seal qualifying feature of Mousa SAC. Effects associated with the proposed works taken forward for further consideration on common/harbour seal are:

- Disturbance at seal haul-out sites
- Disturbance from underwater noise
- Physical damage from underwater noise

Further consideration has concluded that there are no designated haul-out sites for seals within the bay at Grutness. The nearest designated haul-out site by sea is over 5 km from Grutness. Across land, there is a closer designated site at Scatness, on the other side of Sumburgh Airport. Neither of these sites are visible from the proposal and given the distance from the bay it is concluded that there is no credible mechanism for disturbing common/harbour seal at haul-out sites.

However, given their foraging range, it is concluded that there **is potential for an LSE** as a result of disturbance from underwater noise and/or physical damage from underwater noise on common/harbour seal from Mousa SAC.

#### **In-combination effects**

There are no other marine or terrestrial projects currently planned or recently completed that have the potential to contribute to in-combination effects on this qualifying feature of the SAC with the proposal.

#### **Next steps**

In recognition that there is potential for an LSE on Arctic Tern and Fulmar from Sumburgh Head SPA, on Arctic Tern from Mousa SPA and on common/harbour seal from Mousa SAC, step 4 will be considered.

#### STEP 4: APPROPRIATE ASSESSMENT OF THE IMPLICATIONS FOR THE SITE IN VIEW OF ITS CONSERVATION OBJECTIVES

As there is potential for a LSE on Arctic Tern and Fulmar from Sumburgh Head SPA, on Arctic Tern from Mousa SPA and on common/harbour seal from Mousa SAC qualifying features then consideration of mitigation (additional measures) are provided in Step 4

##### Baseline Environment

The proposal is located within a moderately sheltered embayment, on the south-east coast of Shetland, around an existing and operational pier. There is an active ferry terminal operating from the pier at Grutness which services passengers between Shetland and Fair Isle. The lifeline ferry service is currently operated by the **MV Good Shepherd IV** which carries freight and up to 12 passengers

Immediately adjacent to the bay, to the northwest and southwest, is Sumburgh Airport which serves Shetland with a number of daily flights all year round. Road access to the ferry terminal is obtained from the adjacent main road (A970) which also provides a direct link to the airport. The bay is bordered by a road around its perimeter to the south, west and north, which has regular bus stops.

There are several parking areas around the bay including at the ferry terminal, which also has public toilets and a waiting room for ferry passengers. Immediately north of the terminal is a public footpath which runs through the Sumburgh Head SPA, adjacent to the boulder field, and to cairns at the Scult of Laward. Less than 300 m to the west of the ferry terminal is a large sandy beach accessible to the public and frequented by dog walkers. Aside from the existing ferry pier, there is a stone jetty less than 200 m to the south and, on the north side of the bay, a slip for emergency boat access.

AIS shipping traffic data covering the period 2012-2017 indicates that the bay and surrounding area have on average 208 vessel transits a year. About a one kilometre east of the bay, AIS data shows vessel traffic to increase notably, with more than 600 transits a year. Small recreational boats which are unlikely to provide AIS data also use the bay, and to the north of the airport is a small marina just over a kilometre from the proposal.

It is reasonable to assume that breeding seabirds that use the areas adjacent to the bay are habituated to the presence of the ferry service during spring and summer months in addition to the regular passenger and cargo flights to and from the airport, as well as people using the footpath to the Scult of Laward, alongside the boulder field.

The nearest breeding bird colony to the ferry terminal are those of the Arctic Tern, present in the large boulder field inland of the pier (approximately 75 m from the terminal). The next nearest breeding colony of Arctic Tern is at Scatness, about a kilometre to the west of the bay, on the other side of the airport and outside of the SPA. Other than Arctic Tern, the nearest breeding bird qualifying features of the Sumburgh Head SPA are Fulmar. Occasional Fulmar may ground nest in the local vicinity of the proposal; however, the nearest defined location for breeding Fulmar is at the disused quarry, approximately 300 m inland of the proposal.

The nearest designated seal haul-out site by sea is >5 km north of the proposal. Recent telemetry data presented by the Sea Mammal Research Unit (Carter *et al.*, 2020) estimates the mean number of harbour seals within 5 x 5 km cells at any given time. While the Shetland Isles have a number of hotspots for harbour seal indicated by at-sea usage maps, these are all some way to the north of the proposal, the nearest being around MousaWork by Hague *et al.* (2020) also indicates that usage the offshore area around Grutness by harbour seal is low. The Shetland Records Centre has no records of harbour seal for Grutness but note it is not uncommon to see them beyond the bay (P. Harvey SRC, *pers. comm*). A report by the Special Committee on Seals indicates the declining population trend of harbour seal at Mousa (and across a number of other Scottish sites) (SCOS, 2021).

### **Assessment of Sumburgh Head SPA**

A key difference between Arctic Tern and Fulmar foraging behaviour is the significantly greater foraging range of Fulmar (mean max 542 km) from Arctic Tern (mean max 26 km) (see Woodward *et al*, 2019). Both species exploit fish, invertebrates and other prey that occur within the top part of the water column. On this basis, the conclusions of the assessment for Arctic Tern will be broadly relevant to Fulmar.

#### **Arctic Tern**

Although the proposed works do not directly overlap with any seabird breeding colonies, a credible mechanism for LSE on Arctic Tern was considered from the following effects:

- Damage/Loss of supporting habitat
- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Changes to prey availability
- Increase in water turbidity from sediment plumes

Given the existing operation of the ferry service at Grutness, these potential effects are considered relevant to the construction phase only with the exception of 'damage/loss of supporting habitat', which is considered relevant to the construction and operation phases of the proposal.

The potential for an LSE from these effects is considered relevant to all conservation objectives of the site.

The good practice and management measures to be adopted have already been detailed (see Step 1). The following represent additional measures to mitigate any adverse effect from disturbance of the Arctic Tern and are acknowledged within the assessment conclusions:

- Between the 15 April and 1 August in each construction year, a buffer zone will be established along the eastern edge of the proposal boundary (as demarcated by an existing stone wall adjacent to the road). The Contractor will ensure that workforce and equipment/plant do not cross this buffer zone
- Between the 15 April and 1 August in each construction year, a gradual ramping up of construction activities will take place between the hours of 07:00 and 08:00 each morning, with no work activity before 07:00 and after 19:00 in any given day under normal operations.
- The successful piling Contractor will ensure that piling operations will commence no later than 7 May in any given year.
- A soft start to piling operations at the beginning of the working day will be followed for a minimum of 20 minutes. Piling power will be gradually increased, incrementally, until full operational power is achieved.
- The successful Contractor will contact the RSPB site warden a minimum of 4 weeks before planned commencement of the works. The Contractor will outline the planned steps to the works and the measures (management and/or mitigation) which will be adhered to during the works.
- During the period 15 April – 1 August, a suitably qualified observer (ECoW with relevant bird monitoring experience) must be present to monitor for disturbance and ensure that the above measures are adhered to.

### **Assessment Conclusions (Sumburgh Head SPA)**

The works overlap with the Sumburgh Head SPA within the bay (below Mean High Water Spring (MHWS)). The works do not overlap with nesting habitat for breeding Arctic Terns. The nearest area of breeding habitat for this species is on the boulder field to the east of the eastern extent of the proposal boundary, on the eastern side of the pond (see Figure 1).

The footprint of the pier extension and the additional rock armour will slightly reduce the availability of foraging area within the bay. However, given the easy accessibility to extensive foraging areas elsewhere in the bay and around the coastline (within the SPA) it is concluded that this slight reduction in foraging area (<0.02% of the total SPA area) would have a *de minimis* effect upon the distribution and extent of habitats supporting the species as well as the structure, function and supporting processes of habitats supporting the species.

During construction, temporary damage/loss of foraging habitat in the bay will occur as a consequence of the activities leading to highly localised increases in turbidity (during dredging and piling works) and the potential for reductions in prey resource. The sediment within the bay is dominated by coarse sands with some gravel. Coarse substrata disturbed during dredging (and other underwater activities) will settle out of the water column and on to the seabed within a short space of time (see Stantec, 2023). The large mouth of the bay allows strong exposure to water movement and thus dilution and dispersal of any disturbed sediment will also occur within a short space of time. Given the easy accessibility to extensive foraging areas elsewhere in the bay and around the coastline (within the SPA) it is concluded any loss/damage to foraging area would be highly temporary. Assuming a worst-case scenario that Arctic Terns may be unable to use the bay for foraging during the construction period, the consequences of this temporary habitat loss were considered. Tagging studies carried out on Arctic Terns (n=22) from the southern Reykjanes Peninsula (Iceland) between 2019-2021 showed that they have a foraging range of 4308-68477 km<sup>2</sup> (using 95% kernel areas (Morten *et al.* 2022)). Therefore, loss of the bay would represent only 0.003-0.02% of their home range. Hence, the effect upon the distribution and extent of habitats supporting the species as well as the structure, function and supporting processes of habitats supporting the species would be *de minimis*. Given such availability of alternative foraging habitat it is concluded that there would be no mechanism for displacement from the damage/loss of habitat which would impact upon the conservation objectives.

Airborne noise modelling showed that the main Arctic Tern colony could, as a worst case, experience 71 dB from percussive piling noise (Stantec, 2023, Appendix I). While research suggests that irregular construction noise at levels typically above 70 dB can cause behavioural responses in some waterbird species, above 80 dB generally lead to flight responses (e.g. Wright *et al.*, 2013). The potential effects and likely consequences may also vary considerably between species. For example, whilst Fulmars are unlikely to exhibit any detectable response to disturbance, they may avoid nesting in the same area in the following year if they experience a disturbed breeding season. By contrast, unexpected disturbance of a colony nesting species such as Arctic Tern may, in a worst-case scenario, lead to colony abandonment. Temporary displacement of adults from nests (in all species) can lead to exposure of eggs/chicks and subsequent breeding failure. However, of considerable relevance to the assessment is the baseline environment at this location. The Arctic Tern colony at Grutness experiences regular noise and visual changes from the surrounding area. The existing ferry service runs regularly during the spring and summer (overlaps with the breeding period), providing transport between Fair Isle and Shetland (Grutness). The Arctic Tern colony is also very close (~0.7 km) to the runway at Sumburgh Airport and under the flight path. The airport services multiple flights daily and all year round, with the number of flights increasing per day during spring and summer months. It is reasonable to assume that dependent on weather conditions, aircraft will sometimes fly very close to the colony. A medium aircraft descending at 1000ft (~300m) is known to measure 70 dBA<sup>3</sup>. Without further information on the precise flight paths of aircrafts and take-off/descent procedures, it is difficult to quantify exactly how much noise the birds are receiving. However, assuming a distance of 700m from the colony and aircraft take off measuring ~140 dB, then the birds would receive 63 dB<sup>4</sup>. However, this is likely to be an underestimate as planes may occasionally pass over the colony when ascending/descending.

Considering the nearby ferry terminal, pier and access road are all regularly used in the spring and summer, and the proximity of the nearby airport, it is considered that the Arctic Tern are already

<sup>3</sup> Measuring noise - NATS

<sup>4</sup> <https://www.omnicalculator.com/physics/distance-attenuation>



habituated to some level of disturbance (noise, visual and light). It is also acknowledged that airborne noise generated from aircraft (planes and helicopters) taking off and landing at the airport will be greater than that generated by most of the proposal activities, especially when aircraft fly overhead. While timing of the proposed works will overlap with the breeding period of the Arctic Tern at the boulder field, the commitment to commence piling work **no later than 7 May** would ensure that piling is underway well before the first nests, which typically occur in late May (21-28 May (Megson 1986))<sup>5</sup>. Ensuring that piling operations, in any given year, started way in advance of the first nests was discussed with NatureScot (23 February 2023). If the Arctic Terns do then decide to nest at Grutness, then it is considered highly likely that the noise will continue to be tolerated, and the colony will habituate. If the noise prevents birds from nesting at Grutness it is likely that they will nest elsewhere as there are several other colonies close by on Shetland including a small colony at the Point of Taingpool. Further afield there are larger colonies at Mousa, Noss, Foula, Fetlar and Papa Stour.

The Arctic Tern at the nearby colony are habituated to human presence due to the regular passenger movements at the ferry terminal and the public footpath which continues on from the road, along the shore to the northeast to the Scult of Laward. The sandy beach along the western perimeter of the bay is also regularly frequented by the public including dog walkers.

Many of the materials and equipment will come by road. The workforce will also arrive by road. However, some materials and equipment will arrive by sea. Over the duration of each construction season, vessel movements will not exceed 2 per week on average, in addition to the existing ferry service. Vessels will also be operating immediately adjacent to the jetty to support key construction activities (i.e. barge mounted piling rig (if required) and up to two dredgers). The dredgers and barge mounted piling rig would be operating for several months but within a highly localised area around the pier. As indicated by AIS data, baseline vessel movements in the area of the bay show over 200 vessel transits a year on average, while further offshore there is a significant increase in vessel traffic (>600 transits per year).

Arctic Tern take small fish from the surface of the water or plunge-dive just below the surface. Consequently, underwater noise is unlikely to have any significant effect on foraging Arctic Terns. The foraging range of breeding Arctic Terns is approximately 30 km, thus there is an extensive area of foraging habitat for the Arctic Terns to utilise around the colony. Underwater noise may displace prey (fish); however, assuming a worst-case scenario (as outlined above) the temporary loss of the bay as foraging habitat would represent only 0.003-0.02% of the Arctic Tern home range.

Acknowledging the foraging and feeding behaviour of Arctic Tern, the intermittent but regular daily noise and activity that already exists in this location (Grutness), the relatively small but temporary increase in vessel movements and the additional measures that would be adopted (see above) to reduce effects from disturbance (noise, light and visual), it is concluded that no significant disturbance or displacement effect would occur on the Arctic Tern colony.

As a broader consideration, the relevant effects of the construction activities are all temporary in nature. Construction activities will take place over approximately 8 months in each of 2024 and 2025. The activities are also highly localised, being constrained to a relatively small area of the bay.

Considering all of the above, including the management and additional mitigation measures, it is concluded that **all** the conservation objectives of the Sumburgh Head SPA would be maintained:

- Population of the species as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species.

<sup>5</sup> Shetland Bird report (2019) describes 'large chicks at Grutness on 14<sup>th</sup> July, suggesting a nesting date of early June. The report also records first eggs on 24<sup>th</sup> May at Noss. However, it is understood that nesting was later in 2022, with first eggs on Noss recorded on 9th June (NatureScot, *pers. comm.*).

## **Fulmar**

Although Fulmar can dive deeper than Arctic Tern and have a much greater foraging range (see Woodward *et al.* 2019), Fulmar is still primarily a surface feeder. Furthermore, while Fulmar may be present within the same vicinity from the proposal as Arctic Tern, the Fulmar will be at a much lower density of nesting birds.

Given all of the above the conclusions of the assessment for Arctic Tern are relevant. Thus, it is concluded that all the conservation objectives of the Sumburgh Head SPA would be maintained:

- Population of the species as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species.

## **Assessment of Mousa SPA**

### **Arctic Tern**

Although the proposed works do not directly overlap with any seabird breeding colonies or Mousa SPA, the potential for an LSE on Arctic Tern at Mousa SPA is considered from the following effects:

- Underwater noise disturbance and displacement
- Airborne noise disturbance and displacement
- Visual disturbance and displacement
- Changes to prey availability
- Increase in water turbidity from sediment plumes

Given the existing operation of the ferry service at Grutness, these effects are considered as relevant to the construction phase only.

The additional measures to mitigate any adverse effect from disturbance of Arctic Tern, as outlined above for Sumburgh Head SPA, are relevant to the assessment.

## **Assessment Conclusions**

Mousa SPA is approximately 13 km north of the proposal, therefore the assessment conclusions for the much closer Arctic Tern breeding colony at the boulder field just east of the proposal (within Sumburgh Head SPA) are valid (see above).

Therefore, all the conservation objectives of the Mousa SPA would be maintained:

- Population of the species as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species.

## **Assessment of Mousa SAC**

### **Harbour/Common Seal**

Although the proposed works do not directly overlap with Mousa SAC, the potential for an LSE on Harbour seal from Mousa SAC was determined due to:

- Disturbance from underwater noise
- Physical damage from underwater noise

The good practice and management measures to be adopted have already been detailed (see Step 1). An underwater noise assessment was carried out in relation to the proposal (ABPmer, 2023). Of the activities, the proposed impact piling would generate the greatest levels of underwater noise. The Sound Exposure Level (SEL) received of underwater noise generated during impact piling for the proposed works at Grutness are predicted to reduce to around 139 dB 1  $\mu\text{Pa}^2\cdot\text{s}$  within 1 km of the source of piling (i.e. within the outer part of the pier and wider bay at this location). This SEL is equivalent to a peak Sound Pressure Level (SPL) of 155 dB re 1  $\mu\text{Pa}$  and generally comparable to a small < 10 m length recreational boat (MMO, 2015).

The levels of underwater noise generated by the proposed concurrent dredging activity is predicted to reduce to around 132 dB re 1  $\mu\text{Pa}$  within 1 km of the source which is below the Source Level (SL) generated by most anthropogenic activities (MMO, 2015) and is unlikely to be discernible against existing background noise, particularly at this exposed location which is subject to high wave activity (ABPmer, 2023). The levels of underwater noise generated by vessel movements are significantly lower than the dredging activity and are predicted to reduce to around 124 dB re 1  $\mu\text{Pa}$  within 200 m of the source of piling.

The underwater noise assessment notes that the propagation of noise will be significantly limited by the existing bathymetry and physical constraints of the study area at Grutness and potential effects will be largely limited to within the pier and wider bay area. It considers that any marine mammals present are likely to evade the area and therefore harbour seal are not considered to be at risk of any permanent or temporary injury during impact piling. It is also noted that any marine mammals (including harbour seal) that remain within the predicted behavioural effects zone at the time of percussive piling will be exposed to this disturbance only 42 % of the time (ABPmer, 2023). The behavioural effects zone for harbour seal extends to 3.4 km but assumes that for an effect to occur that a seal would need to be present within the zone for a 24-hr period. However, even if the piling noise was continuous in a 24-hr period, which will not be the case, the seal (or any marine mammal) would be able to evade (move out) the area well within that time frame. Conversely, the instantaneous effect zone for seal is significantly less, being 2 m for Permanent Threshold Shift (PTS) and 4 m for Temporary Threshold Shift (TTS) from the source of piling (ABPmer, 2023). Hence, seals would need to be within 2 m or 4 m of the noise source to immediately induce an effect from PTS and TTS respectively.

The adoption of good practice and management measures has been outlined (see Step 1). The following represent additional measures to mitigate any adverse effect from injury and/or disturbance of harbour/common seal and acknowledge JNCC (2010) draft guidance:

- Soft start: The gradual increase of piling power, incrementally, until full operational power is achieved will be used as part of the piling methodology. This will give marine mammals (specifically harbour/common seal) the opportunity to move away from the area before the onset of full impact strikes. The duration of the soft start is proposed to be 20 minutes in line with the JNCC piling protocol (JNCC, 2010);
- Vibro piling: Vibro piling is proposed to be used where possible (which produces lower peak source noise levels than percussive piling). However, in order to drive the piles to the required design level percussive (impact) piling is likely to be required given the underlying geology and depth of piling that is required to ensure the required structural integrity and stability of the new pier wall;
- Marine Mammal Observer (MMO): In addition, the JNCC “Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals during piling” (JNCC, 2010) will be followed during percussive piling. The following procedures will be adhered to by the successful piling contractor:

- Establishment of a 'mitigation zone' of a pre-defined radius (e.g. 500 m) from the piling locations, prior to any percussive piling. Within this mitigation zone, observations of harbour seal will be undertaken by a trained member of the construction team using marine mammal identification resources;
- Thirty minutes prior to the commencement of percussive piling, a search should be undertaken by the MMO to determine whether harbour seals are within the mitigation zone. Experience has shown that seals can be attracted to noise and/or human presence. The commitment to a soft start (see above) will mitigate effects to harbour seal and allow them to move away from the noise source;
- During percussive piling, the MMO should observe the mitigation zone to determine whether marine mammals are within this area. Construction workers will be alerted if harbour seals are identified. If marine mammals arrive in the works area once works have commenced then works can continue as marine mammals have moved into the area with a known noise level being generated; and
- If there is a pause in percussive piling operations for any reason over an agreed period of time, then another search (and soft-start procedures for piling) should be repeated before activity recommences. If, however, the mitigation zone has been observed while piling has ceased and no marine mammals are present in the zone, piling activity can recommence immediately.

The foraging range of harbour seal is up to 50 km (SCOS, 2021). The low number of harbour seal records and telemetry data all indicate that the bay at Grutness is not an important foraging area for this species. Thus, displacement of harbour seal and/or prey fish species from the bay as a result of underwater noise would not lead to any permanent loss of species distribution or population.

### **Assessment Conclusions**

Mousa SAC is approximately 14 km north of the proposal. Baseline information (see above) indicates that harbour seal are likely to be relatively low in density around the bay at Grutness with no records from within the bay (P. Harvey SRC, *pers. comm*).

Underwater noise will be generated by a number of the proposal activities with the key ones identified as vessel movements, dredging and piling activities. Vessel movements associated with the proposal will be less than twice per week on average in addition to the presence of dredgers and/or barge mounted piling rig. Given that approximately 1 km east of the bay AIS shipping traffic data indicates a weekly density of vessel transits to be between 20-50; it is concluded that marine mammals would be habituated to the regular transit, movement and sound of vessels in the wider area. Thus, the addition of several more vessel movements a week would have no adverse effect on harbour seal from underwater noise.

As a broader consideration, the relevant effects of the construction activities are all temporary in nature. Construction activities will take place over approximately 8 months in each of 2024 and 2025. The activities are also highly localised, being constrained to a relatively small area of the bay.

Considering all the above, the findings of the underwater noise assessment (ABPmer, 2023), good practice and management measures, along with the additional mitigation measures that acknowledged JNCC (2010) draft guidance, it is concluded that **all** the conservation objectives of Mousa SAC would be maintained:

- Population of the species as a viable component of the site;
- Distribution of the species within site;
- Distribution and extent of habitats supporting the species;
- Structure, function and supporting processes of habitats supporting the species; and
- No significant disturbance of the species.





## STEP 5: CAN IT BE ASCERTAINED THAT THE PROPOSAL WILL NOT ADVERSELY AFFECT THE INTEGRITY OF THE SITE?

### **Sumburgh Head SPA**

Acknowledging the good practice and management measures adopted by the successful contractor (see Step 1) and implementation of additional mitigation measures specific to reducing the potential for effects on seabirds (specifically to Arctic Tern and Fulmar) (Step 4), it is concluded that the works will not lead to an adverse effect on site integrity of Sumburgh Head SPA. Consideration has been given to the proposal either alone or in-combination with other activities, projects or plans, with respect to the site's structure, function and conservation objectives.

### **Mousa SPA**

Acknowledging the good practice and management measures adopted by the successful contractor (see Step 1) and implementation of additional mitigation measures specific to reducing the potential for effects on seabirds (specifically to Arctic Tern) (Step 4), it is concluded that the works will not lead to an adverse effect on site integrity of Mousa SPA. Consideration has been given to the proposal either alone or in-combination with other activities, projects or plans, with respect to the site's structure, function and conservation objectives.

### **Mousa SAC**

Acknowledging the good practice and management measures adopted by the successful contractor (see Step 1) and implementation of additional mitigation measures specific to reducing the potential for effects on marine mammals (specifically to harbour/common seal) (Step 4), it is concluded that the works will not lead to an adverse effect on site integrity of Mousa SAC. Consideration has been given to the proposal either alone or in-combination with other activities, projects or plans, with respect to the site's structure, function and conservation objectives.

It is concluded that the proposal will not lead to an adverse effect on site integrity on any European/Ramsar site.

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## Abbreviations

AA	Appropriate Assessment
BCD	Below Chart Datum
BTO	British Trust for Ornithology
HGVs	Heavy Goods Vehicles
HRA	Habitat Regulations Appraisal
LSE	Likely Significant Effects
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MS-LOT	Marine Scotland Licensing Operations Team
NS	NatureScot
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SCIs	Sites of Community Importance
SIC	Shetland Islands Council
SMRU	Seal Mammal Research Unit
SNH	Scottish Natural Heritage
SPA	Special Protection Areas
SPL	Sounds Pressure Level

SSSI            Site of Special Scientific Interest  
UK             United Kingdom



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