



**Flotta Ultra Deep Water Quay  
Environmental Impact Assessment (EIA) Scoping  
Report**

**February 2024**

# CONTROL SHEET

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# 1 INTRODUCTION

## 1.1 Background

Repsol is evaluating options to facilitate its decommissioning program in the UK and create value through business diversification. In order to achieve this, Repsol is currently reviewing the feasibility of an Ultra Deep-Water Quay (UDWQ) at Flotta in Orkney, which could support the UK decommissioning and offshore wind industries.

It has been identified that there will be significant demand for deep water quays in the UK, especially from the oil and gas decommissioning and offshore wind sector and it is believed that the Flotta Terminal possesses the required attributes to host a UDWQ.

Repsol UK has appointed Ernst Young (“EY”) for the development of the Ultra Deep-Water Quay facility (UDWQ) at Flotta, Orkney Islands and EY has appointed Arch Henderson LLP (“AHLLP”) to execute the developmental work of UDWQ. As part of the developmental process, AHLLP has appointed EnviroCentre Ltd to undertake an Environmental Impact Assessment (EIA) scoping report for the development.

## 1.2 Purpose of report

The purpose of this report is to seek an EIA scoping opinion from the Orkney Islands Council (“OIC”) and Marine Directorate – Licensing Operations Team (“MD-LOT”) as required by The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2017 respectively.

## 1.3 The Applicant

Repsol UK is an oil and gas exploration and production company operating in the North Sea. It is based in Aberdeen, Scotland and operates 38 fields, on the UK Continental Shelf with 11 offshore installations (ten fixed and one floating) and two onshore terminals - at Flotta in Orkney and Nigg in the Cromarty Firth.

## 1.4 The Need for Development

### Oil and gas decommissioning industry

Oil & Gas platform operators are obligated to decommission their assets when the oil fields come to the end of their economic life. There are over 340 oil and gas (O&G) platforms in the UK Continental Shelf (UKCS), many of which have reached or are approaching the end of their useful lives.

There is significant demand for decommissioning facilities due to such a large number of assets requiring decommissioning with a limited supply of such facilities. At the moment, no UK port facility has sufficient facilities to enable direct competition with European counterparts for large semi-submersible crane vessels to offload decommissioned installations.

Repsol UK has the potential to develop a UDWQ in close proximity to the largest north northern sea and central northern sea platforms to compete with Norwegian ports.

Developing the UDWQ at Flotta could generate significant cost savings for the decommissioning process in the UKCS by reducing the investment required from platform operators, assist onshore contractors in accessing wider market opportunities and have a positive economic and social impact on Orkney and the UK. Orkney not only has a proud legacy of supporting the UK O&G industry but also a skilled supply chain and an existing oil terminal at Flotta.

A UDWQ at Flotta would not be unique to Scotland as multiple quays exist, however, they do not have the requirements for large platform decommissioning for large vessels berthing. It will also assist in fulfilling the growing demand of the decommissioning market.

## Offshore wind industry

Offshore wind is facing large demand with limited supply, where there is a shortage of adequate facilities to manufacture, assemble and store offshore wind assets prior to Scottish supply.

A key finding of the Crown Estate report Scotland's 2020 Ports for Offshore Wind study<sup>1</sup> was a forthcoming capacity gap in land available at Scottish ports for marshalling and assembly activity. The study also noted that "there is a significant risk that demand for port capacity in Scotland for large scale uses in the offshore wind construction phase may exceed current capacity within the 2020s or 2030s."

In 2022, 20 projects were awarded seabed option agreements through the ScotWind auction process and Flotta is well positioned to serve the developers, being on the natural sheltered harbour of Scapa Flow and within a 6-hour sail to nine offshore sites.

The development of the UDWQ at Flotta would therefore be of significant value as a facility for Fabrication and Manufacturing or Marshalling and Assembly of Offshore wind projects.

## 1.5 The Legislative Context

The proposed development at Flotta is subject to local, national, and European legislation of which the following is the principal legislation:

- The Harbours Act 1964;
- The Town and Country Planning (Scotland) Act 1997, as amended by the Planning etc. (Scotland) Act 2006 – for works on land and to the mean low water mark. An application for Planning Permission will be determined by OIC;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as 'the EIA Regulations');
- The Marine (Scotland) Act 2010 (Marine Licences) – Under Section 20(1) of the Marine (Scotland) Act 2010 (from 0 -12nm) and Section 65(1) of the Marine and Coastal Access Act 2009 (from 12 – 200nm)<sup>2</sup>, a marine licence from Scottish Ministers is required if organisations intend on carrying out certain acts in the Scottish marine area such as:
  - the deposit or removal of a substance or object;
  - Construction, alteration, and improvement works,
  - Dredging, and
  - The deposit or use of explosives.
- Marine Directorate stipulate that any associated dredging works taking place that involves disposal at sea, then a Marine Licence for Sea Disposal may also be required; and

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<sup>1</sup> Crown Estate report Scotland's 2020 Ports for Offshore Wind study

<sup>2</sup> Circular 1/2015 The Relationship Between the Statutory Land Use Planning System and Marine Planning and Licensing - <http://www.gov.scot/Publications/2015/06/5851/4>

- The Marine Works (Environmental Impact Assessment) Regulations 2017) (for works below the mean low water mark) (hereafter referred to as ‘the Marine EIA Regulations’).

### 1.5.1 National policy

In terms of Planning Policy, the proposed development aligns with the priorities of National Planning Framework 4 (NPF4<sup>3</sup>) which was adopted by the Scottish Government in February 2023.

The proposed development aligns with the Regional Spatial Priorities for the Orkney Islands of NPF4. With reference to NPF4, the Energy Innovation Development on the Islands is one of the key spatial strategies and states the following:

*“Quay to service renewable energy, energy transportation, energy decommissioning, fabrication or freight handling, including new or enhanced associated laydown or operational area at, Scapa Flow, and Hatston (Kirkwall)”*

In terms of Marine Planning Policy<sup>4</sup>, the proposed development aligns with the priorities of the National Marine Plan which was adopted by the Scottish Government in March 2015. Under section 13.10 of the Plan, it states the following-

*“The location of Scottish ports in relation to oil and gas reserves in the North Sea means they have strategic importance in handling products as well as servicing of industry boats and infrastructure and general support of the industry. Sullom Voe, Flotta, Grangemouth, Aberdeen and Dundee are of particular importance.”*

### 1.5.2 Local policy

Orkney Local Development Plan 2017 has been adopted by the OIC and under the Isles Approach section of Business, Industry & Employment (Policy 4) it supports industrial developments on the islands and, it states the following:

*“There is a presumption in favour of business and industrial development on the non-linked isles where it accords with ‘The Isles Approach’ set out within the Spatial Strategy.”*

Where the ‘Isles Approach’ states the following:

*“SS.4 Development within the islands, which support permanent resident populations and are served by public transport services, will be supported where it accords with relevant Plan policies and where it shall not place any unacceptable burden on existing infrastructure and services.”*

Also, it supports the proposal considering the nature of the proposed development as under the Ports & Harbour Section of the Coastal Policy (Policy 12), it states the following:

*“Development which requires a pier and/or harbour location, including for fishing, renewables, aquaculture or marine leisure and recreational purposes, will be supported within areas identified for harbour and pier uses where;*

- a) *the proposal requires a harbour-side location or is ancillary to activities taking place within the harbour area,*

<sup>3</sup> <https://www.gov.scot/publications/national-planning-framework-4/>

<sup>4</sup> Scotland’s National Marine Plan: A Single Framework for Managing Our Seas ([www.gov.scot](http://www.gov.scot))

- b) *the proposal would not adversely affect the commercial viability or efficient working of the harbour or pier for commercial marine related uses,*
- c) *the design, scale and siting of new development would not have a significant adverse effect on the local coastal character and visual amenity, and*
- d) *the proposal complies with the requirements of the HSE where the pier or harbour is covered by an HSE Consultation Zone.*

*The enhancement and upgrading of piers, landing facilities and other facilities associated with the industries which require a pier and/or harbour location will be supported."*

## 1.6 EIA Screening

It is identified that the proposed development is a Schedule 1 development as it falls within the description of Paragraph 8 (2) of both the terrestrial and marine EIA regulations. The paragraph refers to:

*"Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes".*

Accordingly, an EIA is automatically required to support applications under both the Town and Country Planning (Scotland) Act and the Marine (Scotland) Act.

## 1.7 Scoping under the Land Use and Marine EIA Regulations 2017

The general environmental topic areas to be considered within the context of EIA are summarised below:-

- Water Environment (e.g. hydromorphological changes, quantity and quality);
- Biodiversity (e.g. Fauna and flora);
- Archaeology & Cultural Heritage;
- Seascape, Landscape and Visual;
- Noise and Vibration;
- Air Quality;
- Land (e.g. land take) / Soil (e.g. organic matter, erosion, compaction, sealing);
- Climate (e.g. greenhouse gas emissions, impacts relevant to adaptation);
- Traffic, Shipping and Navigation;
- Accident and Natural Disaster;
- Population / Human Health; and
- Material Assets and Waste.

Both land use (terrestrial) and marine EIA Regulations state that a developer may ask the relevant regulatory body for their formal opinion on the information to be supplied in the EIA Report (a 'scoping opinion'). This provision allows the developer to be clear about what the regulatory authority considers the significant effects of the development are likely to be and, therefore, the topics on which the EIA report should focus.

Additional objectives of EIA Scoping are to:

- Establish the availability of baseline data,
- Request that statutory consultees provide any relevant environmental information relating to the site and surrounding area,
- Define a survey and assessment framework through which comprehensive impact assessment can be achieved, and

- Provide a focus for the regulatory authorities' and the consultees' considerations – in terms of:
  - Potential impacts to be assessed,
  - Assessment methodologies to be used,
  - Other areas which should be considered, and
  - Any other environmental issues of perceived concern.

Each regulation requires that any scoping request should be accompanied by:

- A description of the location of the development, including a plan to identify the land,
- A description of the proposed development, and its likely significant effects on the environment; and
- Such other information or representations as the developer may wish to provide or make.

## **1.8 Structure of the report**

This Scoping Report relates to the various activities of the development during both the construction and operational phases of the proposed development. This scoping report has been laid out as follows:

- Section 1 introduces the proposal, the applicant, the need for the project and the regulatory background.
- Section 2 sets out a description of the proposed development to identify the aspects of the project based on which an appraisal of potentially significant environmental effects will be considered.
- Section 3 details the appraisal of potentially significant environmental effects.
- Sections 4 – 11 discuss potentially significant environmental effects on a topic-by-topic basis; and
- Section 12 draws together the conclusions reached for each topic considered in the Scoping Report.

## **1.9 Report Usage**

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

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## 2 THE PROPOSED DEVELOPMENT

### 2.1 Introduction

Repsol UK proposes to develop a dual-purpose ultra deep water quay (UDWQ) facility adjacent to Flotta Terminal, to establish decommissioning capability and support the offshore renewables industry, in partnership with industry experts. Primarily the facility would be utilised to:

- Decommission Repsol UK assets,
- Decommission other facilities, and
- Service the renewables industry, in particular the offshore wind sector as it can provide storage, assembly, operation, and maintenance facilities for the offshore wind projects located in the surrounding area.

### 2.2 The Site and Surrounding Area

#### 2.2.1 Site

Flotta UDWQ is proposed over vacant land owned by Repsol UK located on the Golta Peninsula within Flotta island of the Orkney Islands. The proposed site is centred at National Grid ND 37303 95762.

The Golta Peninsula extends approximately 170 Hectares (ha) on the south side of the sheltered water of Scapa Flow. The land rises from sea level to a height of approximately 30m with seawater depths of -20m Chart Datum (CD) some 180m from the shoreline. The north side of the peninsula is a sheltered location relative to predominantly south-westerly winds.

#### 2.2.2 Surrounding

There is an existing Flotta Terminal, owned and operated by Repsol UK, to the west of the proposed development site. Flotta Terminal covers a 160 Ha. site, approximately one-sixth of the area of Flotta Island and it is a major crude oil facility, involved in the receipt, process, storage and export of crude oil. The terminal became operational in 1976 and has a projected life extending to 2034.

The area lacks any major human habitation and has few rural habitations on the southern part of Flotta Island, beyond Pan Hope. The Golta peninsular does not have any human habitations.

The proposed development site is located within a Local Nature Conservation Site and Seal haul -out site. The entire Flotta Island is surrounded by the Scapa Flow Special Protection Area (SPA) and the marine portion of the proposed development is located within the Scapa Flow SPA.

There are 3 Scheduled monuments on the Golta Peninsular, the closest to the proposed development is approximately 80m east of the site. These monuments belong to both the World Wars and consist of a Barrage site and Battery. The chosen site is located between two Scheduled Monuments (Refer to Chapter 6.1).

### **2.2.3 Connectivity**

Flotta Island is well connected with mainland Orkney Island and Hoy through the local ferry service. Flotta ferry terminal connects to Houton ferry terminal on the Orkney mainland and Lyness ferry terminal and Longhope ferry terminal on Hoy Island.

Once on the Island of Flotta, there is no direct access to the proposed development site, and a bitmac road from the existing flare stack area, around the wind farm sub-station location to the new site, is proposed as detailed on the layout provided as Appendix A.

## **2.3 Consideration of Alternative**

### **2.3.1 Alternative development**

No alternative development has been identified as both National and Local planning policies support the nature of the proposed development. The need and purpose of the proposed development has been discussed previously in Section 1.4.

### **2.3.2 Alternative layout**

There are two layouts under consideration for the proposed development and these are discussed in Section 2.4.

## **2.4 Proposed development description**

### **2.4.1 Proposed development size and layouts**

The proposed development consists of a 600m long quay with -15m CD depth. The general laydown area will be 24.8 ha, along with an Offshore decommissioning area of 4.5 ha. The total area of the site will be 32.1 ha and will include 1.8 million m<sup>3</sup> of cut and fill material. Another layout option includes a 600m long quay with -20m CD depth. The total area of the site will be 47.1 ha and will include 2.9 million m<sup>3</sup> of cut and fill material. Both the layout options are provided in Appendix A and Appendix B respectively.

For the purpose of this EIA, the layout in Appendix B (option 2) will be considered as it is the larger area and includes the footprints of layout option 1. This will be referred to as 'proposed development site', from now onwards.

With the above-stated technical specifications, the proposed development will be capable of serving both the decommissioning and offshore wind markets as it satisfies their requirements:

- A decommissioning facility requires a minimum of -15m to -20m water depth, 200m long quay face and 5 to 10 ha of laydown area; and
- Offshore wind projects require a minimum of -10m to -15m water depth, 400 to 600m long quay and 12 and 20 ha of laydown area.

## 2.5 Proposed development activities

### 2.5.1 Construction phase

Major activities during the construction phase are as follows:

#### **Construction of access road and laying of services**

Construction will commence with the formation of the access road to the main cut and fill site together with the laying of all ducts and services to the site within the road verge. The final road surfacing would take place at the end of the construction phase.

#### **Laydown Site**

The land will be cleared of all non-inert material such as organic soil, vegetated peat, and unsuitable clays. V-shaped ditches will be prepared along the perimeter of the site and silt retentions will be installed before land clearance. The excavated material shall be temporarily stockpiled to be used for site perimeter storage bunds.

Excavation will be undertaken and land levelling carried out. The excavated materials will undergo a select, screen and stock process to separate inert stone and suitable glacial till that is free from all organic and clay material that would be stockpiled. The stockpiled material would be the main inert material fill source for future reclamation and quay works (see below). Any unsuitable overburden will be stored and landscaped in permanent bunds and/or restoration around the perimeter of the site.

The process will involve heavy tracked plant to both excavate and rip soil and rock and pre-treatment of the harder strata through drilling c.100mm dia. holes and controlled delayed explosives (approx. 25 kg per hole).

The land earthworks production is currently estimated at 10,000m<sup>3</sup>/ week (20,000T/week) per drilling rig used. For a proposed development of this nature, it is anticipated that up to 4 drilling rigs could be used per phase on-site at any one time. With anticipated downtime / other site logistics, this is reduced to an estimated 35,000m<sup>3</sup>/week (approx. 70,000T/week).

Surface water will be managed as per the following:

1. V-shaped ditches along the perimeter of the site will protect it from any water runoff; and
2. Sustainable Urban Drainage System (SUDS) settlement ponds will minimise the sediment flowing into the sea. Flocculants balls are proposed that will aid in the sedimentation process through flocculation in the settlement ponds.

This operation is likely to take place over approximately 24 to 30 months for the 32 Ha. site.

#### **Reclamation and Quay Works**

Initial reclamation works would commence by forming the perimeter reclamation bund leading from the access road to the rear of the proposed quay works (west side of the site).

The bund slope faces would have geotextile together with silt booms placed in the sea as the bund progresses to mitigate the migration of fines. Primary and secondary rock armour will be placed over it.



While some secondary armour may be won on-site, it is considered that the majority of armour stone will require to be imported to the site by either road or sea to cover a rock armour slope area in two interlocking layers.

Once this reclamation perimeter bund and armour slope is formed, this shall provide the main land route to access the quay works construction site for labour, plant, and construction materials.

The main quay berth face is currently proposed as a solid quay constructed of steel tubular piles with interlocking sheet piles forming a combi wall solution with a further inner tied sheet pile anchor wall. This design solution has been assessed as appropriate at this time but may vary once final tender procurement is progressed and the contractors' construction methods are known. This combi quay wall will support a concrete cope and deck directly behind followed by general hard core surfaced laydown reclamation area and drainage outside the immediate wall active wedge area.

The anticipated tubular steel piles for the quay wall will require drilled rock sockets to provide suitable pile toe fixity below -15m (or -20mCD) CD dredge level. Bauer BG41 Drill rigs or similar are proposed to work over water from temporary piling platforms (Figure 2-5). The works will be carried out from the reclamation bund or a jack-up barge with silt booms placed to the seaward side.

Drill cuttings would be directed to temporary filter and silt beds on land with no discharge of cuttings to sea or watercourse. Tubular piles and sheet piles are expected to be vibro hammered to the required depth (20 to 40 minutes /day) with no impact hammers anticipated at this stage. Piles will then be filled with tremie concrete.

After vibro piling compaction of reclamation fill and undertaking acceptable plate bearing tests of fill, tie rods will be installed and secured between the front face and rear sheet pile wall and precast and in-situ concrete cope placed.

As the quay works advance, the reclamation fill would advance behind thus affording additional sea fetch protection together with added silt boom used to shore.

Once suitable vibro treatment of quay fill has been undertaken to compact and reduce future consolidation and settlement (H pile on vibro hammer) then the concrete deck will be placed immediately behind the quay face (generally no less than 6 months after fill takes place) with the remaining reclamation and laydown area capped and compacted with graded hardcore surface with falls to V ditch and French drains.

## **Dredging**

Dredging may be required to form the -15mCD options using backhoe dredging technique followed by the transfer of inert stone waste to a split hopper barge for deposit within reclamation behind the quay wall or, if unsuitable, to a licenced offshore disposal site. Volumes of dredge is estimated to be 140,000 m<sup>3</sup>. No dredging will be required in case of -20mCD option is considered for the proposed development.

Currently dredging is assumed to not require any blasting techniques to pre-treat the seabed.

### **2.5.2 Operational phase**

The proposed development will primarily be used for decommissioning oil and gas assets and offshore wind projects as already discussed in Section 1.1. In addition to the EIA process, the proposed development may be subject to additional permitting and licencing regimes during the operational phase. These may include the Pollution Prevention and Control (PPC) Regulations, Water Environment

(Controlled Activities) (Scotland) Regulations, etc. Therefore, certain aspects of the operational phase will be addressed at a later date by separate permitting and licencing regimes.

In the context of activities during the operational phase of the proposed development, road traffic is considered not to be significant due to the location of the proposed development, however, there will be an increase in marine traffic in the area, and increased employment opportunities for the local population by supporting local businesses, for example, maintenance dredging will be carried out during the project life as and when required. In addition, the proposed development will permanently change the seascape/landscape of the area.

## **2.6 Project Schedule**

It is anticipated that the construction phase will take up to 36 months.

## **3 APPRAISAL OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL EFFECTS**

### **3.1 Introduction**

It is appropriate to request a Scoping Opinion from each regulatory body under the EIA and Marine EIA Regulations. As required, sufficient baseline information has been provided regarding the proposed development and the surrounding and receiving environment upon which to base a decision.

This Scoping Report is submitted to OIC Planning and MDLOT with the intention that it should form the basis of their Scoping Opinion.

The information contained in this document is based on our current understanding of the nature of the site and the proposed development and preliminary assessment of the potential environmental impacts of the proposed development.

### **3.2 Topic Areas to be included.**

Our current thinking in the terms of the topics which fall within the scope of the EIA and subsequent EIAR are listed below:

- Water Environment (coastal processes and peat soil);
- Biodiversity;
- Airborne Noise;
- Archaeology and Cultural Heritage (including potential vibration effects on Scheduled monuments);
- Seascape, Landscape and Visual;
- Carbon Impact Assessment;
- Shipping and Navigation; and
- Socio-Economics.

The approach to the appraisal of each of these topic areas is outlined in Sections 4 - 11 with the inclusion of baseline data where available. The appraisals will consider the potential environmental impacts related to both the construction and operational phases, where applicable, and either scope in or out the need for further assessment through the EIA process.

### **3.3 Other Assessments**

This section describes those issues which are relevant to the proposed development however do not in our view merit or justify a full chapter within the EIAR.

On the basis of professional judgement and review of baseline conditions, full impact assessment is not considered necessary for the following topics:

- Air Quality;
- Population and Human Health;
- Climate Change and Resilience;
- Traffic Assessment;
- Accidents and Natural Disasters; and

- Material Assets and Waste.

The justifications for our intended discounting the above environmental topics from inclusion as full chapters in the EIAR are provided below. Climate Change and Resilience; Traffic Assessment; and Population and Human Health are addressed in Chapter 9, 10 and 11 respectively.

### 3.3.1 Air Quality

The proposed UDWQ site is located adjacent to an industrial area of Flotta (i.e. Flotta Terminal), and is influenced by maritime weather conditions. In order to inform the Scoping Report, the relevant 1km background air quality concentration maps were obtained from the Scottish Air Quality and DEFRA websites. The 2019 measured annual average concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> for Orkney indicates that air quality is good with the pollutant concentrations being well below the relevant National Air Quality Objectives of 40µg/m<sup>3</sup>, 18µg/m<sup>3</sup> and 10µg/m<sup>3</sup> respectively. The 2019 Air Quality Annual Progress Report<sup>5</sup> for OIC (the most up-to-date report available) does not identify any Air Quality Management Areas (AQMAs) within the council area. In addition, OIC does not currently operate any automatic air quality monitoring stations within their boundary.

The proposed development, however, has the potential to impact local air quality in a number of ways with the key issues in relation to this environmental topic being plant and vehicle emissions from the internal site road and dust emissions during the construction phase.

This is a new facility which is sited within an island location. It is envisaged at this stage in the project that the road traffic generated by the development will be restricted to site workers. Marine assets and supplies will largely be brought to and from site by sea. As such the increase in “road” traffic is regarded as being insignificant.

Construction of the proposed development is considered to be a temporary impact and can be controlled through developing a site-specific Dust Management Plan as part of a Construction Environmental Management Plan (CEMP). The dust impact assessment requires specific information on site operations during construction, including preparatory earthworks, general construction, and the potential for track out. Currently this information is still being finalised. It is therefore proposed to defer the construction dust assessment and formulation of a Construction Dust Management Plan until such time as details on construction activities have been finalised.

Based on the above information, it is proposed to scope out, “Air Quality”, from the EIAR.

### 3.3.2 Accidents and Natural Disasters

IEMA’s guidelines, “*Major Accidents and Disasters in EIA: A Primer*” has been referred and the proposed development has been tested against following questions to screen it with respect to major accidents and/or disasters.

- Is the development a source of hazard itself that could result in a major accident and/or disaster occurring?
- Does the development interact with any sources of external hazards that may make it vulnerable to a major accident and/or disaster?
- If an external major accident and/or disaster occurred, would the existence of the development increase the risk of a significant effect to an environmental receptor occurring?

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<sup>5</sup> orkney\_laqm\_progress\_report\_2019\_final.pdf (scottishairquality.scot)

As per the guidelines, it is valid to consider and identify proposed mitigation at this stage and if it is demonstrated that proposed design measures, existing legal requirements, and codes and standards are likely to adequately control any potential vulnerability to a major accident and/or disaster then this should be factored into the conclusion.

Similar to other ultra deep water quays, there will be potential for accidents to occur, however it is anticipated that a Marine Safety Management System / Standard Operating Procedures will be developed to promote safe and efficient operations and will be compliant with the Port Marine Safety Code. These procedures will be introduced at this new facility once operational thereby reducing the likelihood of accidents occurring.

The proposed development is not located within an area of significant seismic activity, nor is climatic factors prone to creating disasters such as tsunamis, hurricanes, or catastrophic flooding.

Based on the above information, it is proposed to scope out, "Accidents and Natural disasters", from the EIAR.

### **3.3.3 Material Assets and Waste**

The proposed development includes significant amount of excavation to be undertaken. The excavated materials will undergo a select, screen and stock process to separate inert stone and suitable glacial till that is free from all organic and clay material that would be stockpiled. The stockpile material would be the primary source of inert fill material for future reclamation and quay works. Any unsuitable overburden will be stored and landscaped in permanent bunds and, or restoration around the perimeter of the site.

This approach will reduce the requirements of extraction of new fill material and also reduce the waste material going to the landfill. The process will encourage circular economy.

Measures to reduce the waste generation is considered at design stage by considering two layout options with the second option (Appendix B), not include any sort of dredging.

The proposed Construction Environmental Management Plan (CEMP) will include a Site Waste Management Plan (SWMP) for the construction phase. SWMP shall contain the measures to be undertaken for various types of waste generated. For the operational phase, applicable permits and licenses will be acquired and relevant best practices will be followed.

The proposed development will need construction material and generate waste similar to other UDWQ projects which is not significant in terms of, "material consumption and waste generation", compared to developmental projects.

Based on the above information, "Material assets and Waste", are proposed to be scoped out of the EIAR.

## **3.4 Cumulative Assessment**

It is not proposed to incorporate a section within the EIA report dedicated to cumulative assessment. Instead, the chapter for each environmental discipline will consider the potential for cumulative impacts within their individual impact assessments.

A review of The Orkney Islands Council Planning Portal<sup>6</sup> was undertaken to identify any planning application which could have cumulative effects on the environment and no planning applications were

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<sup>6</sup> Reviewed on 08 Jan 2024

identified in the vicinity of the site. Similarly, a review of MD-LOT portal resulted in identification of the following project in the vicinity of the site.

**Table 3-1: Projects in the area as per MD-LOT portal**

<b>S/N</b>	<b>Title</b>	<b>Ref No</b>	<b>Applicant</b>	<b>Type</b>
1	Scapa deep Water Quay- Construction, alteration or improvement of any works	00010511	Orkney Island Council Harbour Authority	EIA Development

## 4 WATER ENVIRONMENT

### 4.1 Introduction

The water environment is considered to encompass hydrology, hydrogeology, and water quality, whilst coastal processes are considered to encompass tides, waves, and sediment transport processes. This section of the Scoping Report will therefore address all of these subject areas, in addition to geology. The associated interactions between the water environment, ecology and fisheries will be considered within the ecology section of this document.

The Water Framework Directive (WFD) (Council Directive 2000/60/EC) aims to protect and enhance water bodies within Europe and covers all estuarine and coastal waters out to 1 nautical mile. This requires that there is no deterioration in the quality of surface or groundwater bodies and aims to achieve good ecological status or potential. The implications of the WFD must be considered when assessing this project and the details of how compliance will be achieved provided in the EIA.

The development proposals for construction, and associated dredging, have the potential to cause changes to the baseline hydro(geo)logical conditions and the ongoing coastal processes at the site, and in the wider area. Given the importance of water as a valued resource, coastal processes to the surrounding environment, and of ensuring sustainable development, this initial assessment of the water environment and coastal processes is considered essential.

### 4.2 Study Area

The study area will be finalized during the EIAR but it is not envisaged to be more than 20 km from the proposed development site.

### 4.3 Baseline Conditions

#### 4.3.1 Environmental Designations

The Site is located within the Scapa Flow Special Protection Area (SPA) which is designated for supporting a number of bird species. No other designated sites relating to the water environment are located within the study area.

#### 4.3.2 Geology and Soils

The online British Geological Survey (BGS) 1:50,000 map identifies that the development site is underlain by sandstone of the Upper Eday Sandstone Formation and siltstones, mudstones, and sandstone of the Eday Flagstone formation<sup>7</sup>.

The BGS 1:50,000 map shows that superficial deposits are absent from the shoreline. Till (Devension – Diamicton) underlies the site. The Carbon and Peatland 2016 map<sup>8</sup> shows Class 1 peat to be present

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<sup>7</sup> British Geology Survey 1:50,000 (Geology of Britain Viewer- <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

<sup>8</sup> Scottish Natural Heritage (2016) Carbon and Peatland map - <https://soils.environment.gov.scot/maps/soil-maps/national-soil-map-of-scotland/>

within the Site, review of aerial mapping also shows evidence of previous peat cutting suggesting the presence of peat soils.

Pre-dredge sediment sampling will be undertaken and contamination analysis will be undertaken in accordance with MD-LOT requirements

### **4.3.3 Hydrogeology**

The Hydrogeological Map of Scotland<sup>9</sup> (1:625,000 scale) shows that the site has moderately productive aquifer. It is regionally important multi-layered aquifer with moderate yields of up to 5 L/s and, to the south of Moray Firth, up to 15 L/s.

Groundwater at the Site is classified under the Water Framework Directive (WFD) monitoring programme as belonging to the Orkney groundwater body (ID: 150430) and has an overall classification of 'Good'.

### **4.3.4 Hydrology and Water Quality**

Review of Ordnance Survey mapping highlights that there are no mapped watercourses or water bodies within the site.

The coastal waters of Scapa Flow are classified under the Water Framework Directive (WFD) monitoring programme as a coastal waterbody. The waterbody is classified as being of overall 'Good' status in 2020 with a hydromorphological status of 'High'. There are no watercourses discharging to Scapa Flow large enough to be classified under the WFD.

### **4.3.5 Flood risk**

The SEPA flood maps do not indicate any river or surface water flood risk.

A review of the SEPA online flood maps identifies that the lower coastal edge of the proposed development site is at high risk of coastal flooding<sup>10</sup>. This prediction does not account for the potential effects of climate change, local bathymetry, or wave action.

### **4.3.6 Tidal Water Levels**

The closest port referenced in Admiralty tide tables is St Mary's, Scapa Flow. Tidal water levels at St Mary's, Scapa Flow as presented within the Admiralty tide tables are shown in Table 4-1<sup>11</sup>. The mean tidal range at St Mary's is 2.7m for spring tides and 1.7m for neap tides. St Mary's, Scapa Flow, has a semi-diurnal tidal curve, with two high tides and two low tides each day, as is the case around the UK.

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<sup>9</sup> BGS 1:625,000 Hydrogeological map. British Geology Survey 1:50,000 (Geology of Britain Viewer-  
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

<sup>10</sup> SEPA, 2020 (<http://map.sepa.org.uk/floodmap/map.htm>)

<sup>11</sup> UK Hydrographic Office, 2023 (Admiralty Tide Tables – Volume 1B)



**Table 4-1: Tidal water levels at St Mary’s Scapa Flow**

Tide Condition	Chart Datum (mCD)	Ordnance Datum (mOD)
Highest Astronomical Tide (HAT)	3.8	2.15
Mean High Water Springs (MHWS)	3.3	1.65
Mean High Water Neap (MHWN)	2.6	0.95
Mean Sea Level (MSL)	1.9	0.25
Mean Low Water Neap (MLWN)	1.4	-0.25
Mean Low Water Springs (MLWS)	0.6	-1.05
Lowest Astronomical Tide (LAT)	-0.1	-1.75

\*Chart Datum correction for Ordnance Datum is -1.65 (relative to OD at Newlyn)

Extreme sea levels have been predicted around the whole UK coastline and published by the Environmental Agency / Department for Environment Food and Rural Affairs report<sup>12</sup>. These extreme levels include the effects of both tides and storm surge but not the effect of amplification within estuaries or sea lochs. In order to provide better estimates around the Scottish coastline, SEPA have updated the original estimates. However, it is noted that the proposed development site is situated inshore of the estuary limit of the extreme sea level predictions for Scapa Flow, and therefore predictions from the Coastal Flood Boundary programme cannot be applied directly to the site.

The SEPA derived extreme sea levels, predicted at the closest point to the development within Scapa Flow (offshore of the prediction limits), are 2.97m Above Ordnance Datum (AOD) for the 1 in 200 year return period event and 3.11mAOD for the 1 in 1,000 year return period event. SEPA recommend a 2100 climate change uplift of 0.93m for coastal levels within the Orkney river basin region<sup>13</sup>. Therefore the 1 in 200 year return period plus climate change event at the prediction location has a level of 3.90mAOD and the 1 in 1000 year return period plus climate change event has a level of 4.04mAOD.

#### 4.3.7 Coastal Processes

Tidal Currents along the nearshore within Scapa Flow are insignificant, with the exception of the entrances to Scapa Flow and narrows between islands. The fetch lengths for wind generation of waves are restricted by the surrounding topography, with wave conditions tending to be dominated by locally generated wind-waves. The entrances to Scapa Flow dissipate much of the offshore wave energy limiting propagation of waves generated around the Orkney Islands into Scapa Flow. Much of the coastline near to the proposed site is fronted by a rock platform with shingle and sand beaches. There is little littoral transport other than limited reworking of glacial till; input of sediment to Scapa Flow is restricted by the construction of the Churchill Barriers<sup>14</sup>. The European Nature Information System (EUNIS) seabed habitat map shows the dominant seabed habitat around the proposed development to be infralittoral seabed and infralittoral mixed sediment in a low energy environment<sup>15</sup>.

Muddy sands and gravels are shown within available mapping of seabed sediment within the proposed development area<sup>16</sup>.

Analysis of historical coastline alignments shows no major changes to the coastline since 1890 and there has been no significant erosion observed<sup>17</sup>.

<sup>12</sup> McMillan et al, 2011. Coastal Flood Boundary Conditions for UK Mainland and Islands. Environment Agency.

<sup>13</sup> Climate change allowances for flood risk assessment in land use planning Version 2. SEPA, 2022.

<sup>14</sup> Ramsay and Brampton, 2000. Coastal Cells in Scotland: Cell 10 – Orkney.

<sup>15</sup> EUNIS 2017 (<https://emodnet.eu/en>).

<sup>16</sup> Marine Scotland (<https://marinescotland.atkinsgeospatial.com/nmpi/>)

<sup>17</sup> Dynamic coast online map available at: <http://www.dynamiccoast.com/webmap.html>

## 4.4 Potentially Significant Effects (Construction)

The proposed development will involve construction activities within, or in close proximity to, the water environment (particularly coastal) including construction of the quay, capital dredging works, land reclamation and formation of the access road, and the creation of a laydown area. The key potential environmental impacts on the water environment during construction are detailed below:

- Potential impact to coastal process including wave action, tidal currents and sediment transport;
- Potential changes in infiltration rates, flood risk and drainage;
- Excavation, oxidation and loss of peat soils;
- Potential contamination of the water environment (coastal, fluvial and groundwater) from spillages, runoff and/or sediment transfer (oil, fuel, suspended solids, and potential contaminants in soil); and
- Potential interaction between water environment and ecology.

## 4.5 Potentially Significant Effects (Operation)

The completed development will be within, or in close proximity to, the water environment and may result in the following potential impacts on the water environment once constructed:

- Potential impact to coastal process including wave action tidal currents and sediment transport;
- Potential contamination of the water environment from wastewater, site discharge and/or traffic; and
- Potential interaction between the water environment and ecology.

## 4.6 Inclusion or Exclusion from EIA

The construction activities involved within the proposed development including dredging, construction of the quay, land reclamation and dredging as described in Chapter 2 all have the potential to impact the coastal processes within Scapa Flow. Assessment of the impact of the proposals on coastal processes will be included within the EIAR and will be informed by hydrodynamic modelling to assess the impacts on coastal processes including wave action, tidal currents, and sediment transport.

Review of the Carbon and Peatland map and aerial imagery shows the presence of peat at the Site, so excavations as part of the formation of the onshore elements of the proposals have the potential to lead to oxidation and loss of peat soils. Assessment of the impacts on peat soils will be included within the EIAR and mitigation proposed as appropriate.

SEPA flood maps do not show risk of fluvial flooding within the site or immediate surrounds, and review of mapping does not show the presence of mapped watercourses. Therefore, it is proposed to scope out the further assessment of fluvial flood risk.

The proposed development is noted to be water compatible for operational reasons. It is considered that given the scale of proposals, the proposed land reclamation works would have a negligible impact on local sea levels. The development design will take account of extreme sea levels and future sea level rise predictions, as appropriate. Therefore, it is proposed to scope out the further assessment of coastal flood risk.

The construction of the site has the potential to generate pollutants/contaminants which could impact the water quality of the nearby water environment. The prevention of pollution during construction and operation of the plant will be a key focus of the EIA. It is considered that if best practise is implemented

following appropriate guidance, creation of a pollution prevention plan and surface water management plan, and installation of sustainable urban drainage measures, there will not be detrimental effects on the existing environmental conditions. Therefore, it is proposed to scope out the further assessment of water contamination.

## **4.7 Assessment Methodology**

The assessment will follow standard EIA procedures and will include:

- Desk based review of the proposed development and surrounding water environment;
- Consultation with key stakeholders to obtain relevant information and ensure their concerns are addressed within the EIAR;
- Establish baseline conditions:
  - Review of coastal processes including bathymetry, tidal currents, wave action, seabed sediment and sediment transport;
  - Review of hydrology, water quality and drainage;
  - Review of geology and soils on site; and
  - Reporting of baseline conditions to help inform potential impacts from the development.
- Coastal modelling (numerical/desk based) study to inform impact assessment.
- Carry out an EIA assessment:
  - Identify potential sensitive environmental receptors and environmental constraints;
  - Identify any potential impacts and impact significance;
  - Identification and assessment of appropriate mitigation measures to reduce and avoid any potential impacts of the proposed development; and
  - Statement of residual impacts.

Baseline data will be used along with modelling results and expert opinions to qualitatively assess the potential impacts of the proposed development and the significance to receptors. The potential impacts will be evaluated in comparison with water quality standards and objectives, environmental quality standards and sediment quality standards.

## 5 BIODIVERSITY

### 5.1 Introduction

This section provides a description of the known baseline conditions and highlights potential impacts of the proposed development on the ecology of the area. For the purposes of the assessment, the ecological interests are sub-divided into Terrestrial Habitats (including faunal interests), Marine & Freshwater Aquatic Habitats (including faunal interests) and Ornithology.

### 5.2 Study Area

The study area considered for scoping with respect to the biodiversity aspects varied per element, as follows. Consideration of designated sites was limited up to 10 km from the Proposed development site. Non-statutory designated sites were limited to within 2 km of the site. Habitat and protected species surveys were undertaken within the site and up to 250 m where possible. Protected species data ranged from 2 km for terrestrial species, to up to 20km for marine species.

### 5.3 Baseline Conditions

#### 5.3.1 Designated sites

The location of all designated sites listed below are provided in Appendix E.

#### Marine Protection Areas (MPAs)

There are no Marine Protection Areas (MPA) located within or surrounding the development site. The nearest MPA, Noss Head, is located approximately 43km to the south of the site.

#### Special Protection Areas (SPA)

The marine portion of the proposed development falls within the boundary of Scapa Flow SPA. The entire Flotta island is surrounded by Scapa Flow SPA and there are four more SPAs within the study area namely, Switha SPA, Hoy SPA, Pentland Firth Islands SPA and Orkney Mainland Moors SPA.

#### Scapa Flow SPA

It is located in the Orkney Islands and falls within the marine boundary of the site. Most of the site is sheltered by Orkney Mainland to the north, Hoy, 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 on the south through the Sound of Hoxa, and to the Atlantic Ocean on the west through Hoy Sound. A diverse range of seabed habitats, including muddy sands, tide swept sands and gravels, kelp forests and maerl beds, support a high diversity of marine life. These rich sheltered waters support large numbers of waterfowl, particularly in the winter months when frequent storms affect the surrounding North Sea and eastern Atlantic.

The site is designated for breeding Red-throated Diver (*Gavia stellata*), non-breeding Great Northern Diver (*Gavia immer*), Black-throated Diver (*Gavia arctica*) and Slavonian Grebe (*Podiceps auratus*), as well as for migratory non-breeding bird populations including Common Eider (*Somateria mollissima*), Long-tailed Duck (*Clangula hyemalis*), Red-breasted Merganser (*Mergus serrator*) and European Shag (*Phalacrocorax aristotelis*).

### **Switha SPA**

It is located approximately 4.6km south of the Flotta site and is a small grassy island east of South Walls in the Orkney archipelago. The boundaries of the site follow those of the proposed Switha SSSI which includes the whole island.

Switha SPA is designated for wintering populations of Greenland Barnacle Goose (*Branta leucopsis*).

### **Hoy SPA**

It is located approximately 7.7km west of the Flotta site and comprises 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 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 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.

Hoy SPA supports more than 20,000 individual seabirds and 120,000 seabirds and is designated for Atlantic Puffin (*Fratercula arctica*), Black-legged Kittiwake (*Rissa tridactyla*), Arctic Skua (*Stercorarius parasiticus*), Northern Fulmar (*Fulmarus glacialis*), Great Black-backed Gull (*Larus marinus*), Common Guillemot (*Uria aalge*), Red-throated Diver and migratory species, Great Skua (*Stercorarius skua*).

### **Pentland Firth Islands SPA**

It is located approximately 10km south of the Flotta site and consists of the small uninhabited islands of Swona and Muckle Skerry situated in the Pentland Firth between South Ronaldsay and mainland Scotland. The islands are low-lying with cliffs and rocky shorelines. Above the shore the islands support a variety of habitats including maritime heath, rough grassland, marsh, and open freshwater. The boundaries of the SPA follow the boundary of the Pentland Firth Islands SSSI.

Pentland Firth Islands SPA is designated for a breeding population Arctic Tern (*Sterna paradisaea*).

The site is of additional interest for its overall breeding seabird assemblage and regularly supports about 7,700 individuals of 16 species. In addition to Arctic Tern the assemblage includes the Storm Petrel (*Hydrobates pelagicus*) and Sandwich Tern (*Sterna sandicensis*); and the regularly occurring migratory species Northern Fulmar, European Shag, Arctic Skua, Black-headed Gull (*Larus ridibundus*), Common Gull (*Larus canus*), Lesser Black-backed Gull (*Larus fuscus*), Herring Gull (*Larus argentatus*), Great Black-backed Gull, Black-legged Kittiwake, Common Guillemot, Razorbill (*Alca torda*), Black Guillemot (*Cephus grille*) and Atlantic Puffin.

### **Orkney Mainland Moors SPA**

It is located approximately 10km north of the Flotta site and comprises four areas of moorland on Mainland, Orkney. The predominant habitats include extensive areas of blanket bog, acid grassland, wet and dry heath, acidic raised-mire, and calcareous valley mire. Acid conditions predominate but botanically rich alkaline flushes occur. Sheltered valleys and dales support willow scrub, tall-herb, and flush vegetation. There are several small oligotrophic lochs on the site.

Orkney Mainland Moors SPA is designated for breeding and non-breeding Hen Harrier (*Circus cyaneus*), breeding Red-throated Diver, and breeding Short-eared Owl (*Asio flammeus*). The Hen Harrier population on this site is one of the largest and the densest in Britain.

## Special Areas of Conservation (SAC)

There are no Special Areas of Conservation (SAC) located within or surrounding the development site. The nearest is Hoy SAC located at approximately 8.5 km west of the site and is designated for its habitats including base-rich fens, alpine and subalpine heaths, blanket bog, flats in crevices on base-rich rocks, dry heath, acid peat-stained lakes and pond, wet heathland with cross-leaved heath, hard-water springs depositing lime and vegetated sea cliffs.

## Sites of Special Scientific Interest (SSSI)

There are no SSSIs in the site, however there are four within the study area.

### Switha SSSI

It is located approximately 4.6km south of the Flotta site and is designated for its important wintering population of Greenland Barnacle Geese, which also feed on the neighbouring island of South Walls.

### Hoy SSSI

It is located approximately 9km to the west of the Flotta site and extends down the west coast of the island from the Bay of the Tongue on the north coast to Tor Ness in the south and includes a large part of the interior of the island and reaches as far as the east coast between Lyre Geo and Chalmers Hope.

The site is designated for its coastal geomorphology of Scotland, non-marine Devonian, old red sandstone igneous, quaternary of Scotland as well as an important range of habitats, including blanket bog (covers over 4000 hectares of Hoy SSSI), dystrophic loch, upland assemblage (dwarf-shrub heath, acid grassland, montane and fen, marsh, and swamp) and upland oak woodland.

Hoy SSSI is also designated for populations of breeding birds including the Great Skua (most important nesting area in Orkney), Arctic Skua, Great Black-backed Gulls, Red-throated Divers, Fulmar, Peregrines (*Falco peregrinus*) and common Guillemot. The site is also designated for its breeding bird assemblages for species including Hen Harrier, Buzzard (*Buteo buteo*), Merlin (*Falco columbarius*), Red Grouse (*Lagopus lagopus scotica*), Golden Plover (*Pluvialis apricaria*), Dunlin (*Calidris alpina*), Snipe (*Gallinago gallinago*), Curlew (*Numenius arquata*), Redshank (*Tringa totanus*), Common Sandpiper (*Actitis hypoleucos*), Short-eared Owl, Stonechat (*Saxicola rubicola*), Wheatear (*Oenanthe oenanthe*), Raven (*Corvus corax*) and Twite (*Linaria flavirostris*). The site is also designated for its breeding seabird colony and comprises fourteen different breeding species.

### Pentland Firth Islands SSSI

It is located approximately 10km south of the Flotta site and is designated for important numbers of breeding Arctic tern and vascular plant assemblages, with a nationally rare species of eyebright (*Euphrasia heslop-harrisonii*), together with three nationally scarce species of oysterplant (*Mertensia maritima*) and the pondweeds flat-stalked pondweed (*Potamogeton friesii*) and slender-leaved pondweed (*Potamogeton filiformis*) occur on Swona.

### Waulkmill SSSI

It is located approximately 9.7km north of the Flotta site and is a sheltered south-facing bay situated on the northern side of Scapa Flow. It is designated for saltmarsh, maritime cliff, and moth species golden-rod case-bearer (*Coleophora obscenella*). The maritime cliff is one of the best general habitats for moths and butterflies in Orkney and is the only known location in Orkney for the golden-rod case-bearer moth.

### 5.3.2 Other Designations

#### Local Nature Conservation Site (LNCS)

##### Golta Peninsula LNCS

It is located within the site and consists of moorland habitats, including blanket bog on deep peat, with bog cotton and heather; drier moorland on thin peat; and some coastal grassland and cliff. The bog vegetation has been modified by peat cutting and burning in the past. Special habitats (nationally important) include upland heath, blanket bog, maritime cliff and slope and maritime grassland. A variety of waders and other breeding birds nest here such as Oystercatcher (*Haematopus ostralegus*), Shelduck (*Tadorna tadorna*), Eider (*Somateria mollissima*), Red Grouse, Ringed Plover, Common Gull, Great Black-backed Gull, Arctic Tern, Skylark (*Alauda arvensis*) and many Meadow Pipit (*Anthus pratensis*), with those nationally important including Lapwing (*Vanellus vanellus*), Snipe, Curlew (*Numenius arquata*), Redshank and Skuas both Arctic and Great. Otter (*Lutra lutra*) are also considered as nationally important to the site.

##### Western Moors, Flotta LNCS

It is located 2km to the west of the site and is almost entirely covered in blanket bog, mostly dried out and with extensive peat cutting and tracks, with special habitats (nationally important) including upland heath and blanket bog. The site supports a variety of breeding birds, such as Oystercatcher, Common Gulls, Raven, Meadow Pipit, Rock Pipit (*Anthus petrosus*) and Stonechat as well as nationally important Curlew, Snipe, Arctic Skua, Great Skua, Arctic Tern, Short-eared Owl, and Skylark. In addition, the large heath butterfly (*Coenonympha tullia*) is considered nationally important to the site.

### 5.3.3 Terrestrial Habitat and Species

#### Habitats

A Preliminary Ecological Appraisal was undertaken on the site and concluded the following UKHab<sup>18</sup> habitats to be present:

- Degraded blanket bog (SBL<sup>19 20</sup>);
  - Purple moor-grass and rush pasture (SBL);
  - Dry heath – upland (H4030) (Annex I);
  - Splash zone with lichens (SBL<sup>21</sup>);
  - Soft rock sea cliffs (SBL<sup>22</sup>); and
  - Built linear features.
- **Degraded blanket bog (f1a6)** habitat occurs where peat-forming bog-mosses have largely disappeared due to drainage of the bog and are replaced typically by grasses and sometimes heather. This habitat exists within the west of the site and is dominated by purple moor-grass (*Molina caerulea*).

<sup>18</sup> Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020) The UK Habitat Classification User Manual Version 1.1 Available at: <https://ukhab.org/>

<sup>19</sup> SBL (Scottish Biodiversity List)

<sup>20</sup> Blanket bogs are Annex 1 priority habitats, however the blanket bog condition on this site does not fit the criteria for Annex 1, however would still be considered within the SBL blanket bog category.

<sup>21</sup> Splash zone with lichens habitat fits the criteria for SBL priority habitat Maritime cliffs and slopes where cliffs or slopes are present behind it.

<sup>22</sup> Soft rock sea cliffs fit the criteria for SBL priority habitat Maritime cliffs and slopes where cliffs or slopes are present behind it.

- **Purple moor-grass and rush pasture (f2b)** habitat occurs on both poorly drained, usually acidic soils in lowland areas of high rainfall. This habitat exists within the south and north of the site and is dominated by purple moor-grass.
- **Dry heath – upland (H4030) (h1a5)** habitats typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. This habitat exists within the eastern and southern extent of the site and is dominated by heather (*Calluna vulgaris*).
- **Splash zone with lichens (t1e)** comprise cliffs and rocks of the sublittoral spray zone, mostly occupied by lichens. This habitat exists along sections of the north of the site.
- **Soft rock sea cliffs (s2a6)** comprise sea cliffs of rocks that are relatively easily eroded and characterised by slumped cliff faces that gradually become vegetated and include a range of habitat types including grasslands, scrub and reedbed. This habitat exists along sections of the north of the site.
- **Built linear features (u1e)** habitats comprise degraded dry-stone walls in the south of the site and a partially gravelled track in the north of the site.

Other habitats not included under the UKHab include Scapa Flow marine area, of which the site boundary encompasses a small area.

The Carbon and Peatland 2016 map via Scotland's Environment Web<sup>23</sup> shows three carbon and peatland classes within the site, including:

- Class 1- Nationally important carbon-rich soils, deep peat, and priority peatland habitat. Areas likely to be of high conservation value; and
- Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils.

Degraded blanket bog falls within Class 1. Dry heath – upland and Purple moor-grass and rush pasture habitats fall within Class 4. Locations of each Class are detailed in Figure 5-1.

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<sup>23</sup> Scotland's Environment Web available at: <https://marine.gov.scot/information/kelp-and-seaweed-communities-sublittoral-sediment> last accessed 01/11/2023





Figure 5-1: Carbon and Peatland Class Types.<sup>24</sup>

### Terrestrial Invasive Non-Native Species (INNS)

Five terrestrial INNS are considered to inhabit Flotta, including Rat (*Rattus rattus*), hedgehog (*Erinaceus europaeus*), rabbit (*Oryctolagus cuniculus*), feral cat (*Felis catus*) and house mouse (*Mus musculus*)<sup>25</sup>. Trap deployment for INNS stoat (*Mustela erminea*) has been undertaken on Flotta since 2019, however no stoats have been recorded on Flotta.

### Notable Fauna

The following list includes all terrestrial species afforded legal protection, those included within the SBL and Orkney Local Biodiversity Action Plan (LBAP), and all bird species that are considered to have the potential to suffer negative effects from the proposed development:

- Otter
- Great Northern Diver
- Red-throated Diver;
- Black-throated Diver;
- Slavonian Grebe;
- European Shag;
- Common Eider;
- Long-tailed Duck;
- Common Goldeneye;
- Red-breasted Merganser;
- Oystercatcher;
- Shelduck;
- Red Grouse;

<sup>24</sup> Obtained from Scotland's Environment Web Map via Carbon and Peatland (2016)

<sup>25</sup> Orkney Native Wildlife Project 'Orkney State Eradication Plan', available at: <https://www.nature.scot/sites/default/files/2020-05/Orkney%20Native%20Wildlife%20Project%20-%20SEA%20consultation%20-%20Operational%20plan.pdf> last accessed 06/11/2023

- Ringed Plover;
- Common Gull;
- Great Black-backed Gull;
- Arctic Tern;
- Skylark;
- Meadow Pipit;
- Lapwing;
- Snipe;
- Curlew;
- Redshank;
- Arctic Skua; and
- Great Skua.

### 5.3.4 Marine and Freshwater Habitat and Species

#### Habitats

No aquatic habitat surveys have been undertaken on the site.

No reef and kelp and seaweed beds on sublittoral sediments within the Orkney Isles are present within or near the Flotta site<sup>26</sup> as detailed in Figure 5-2.

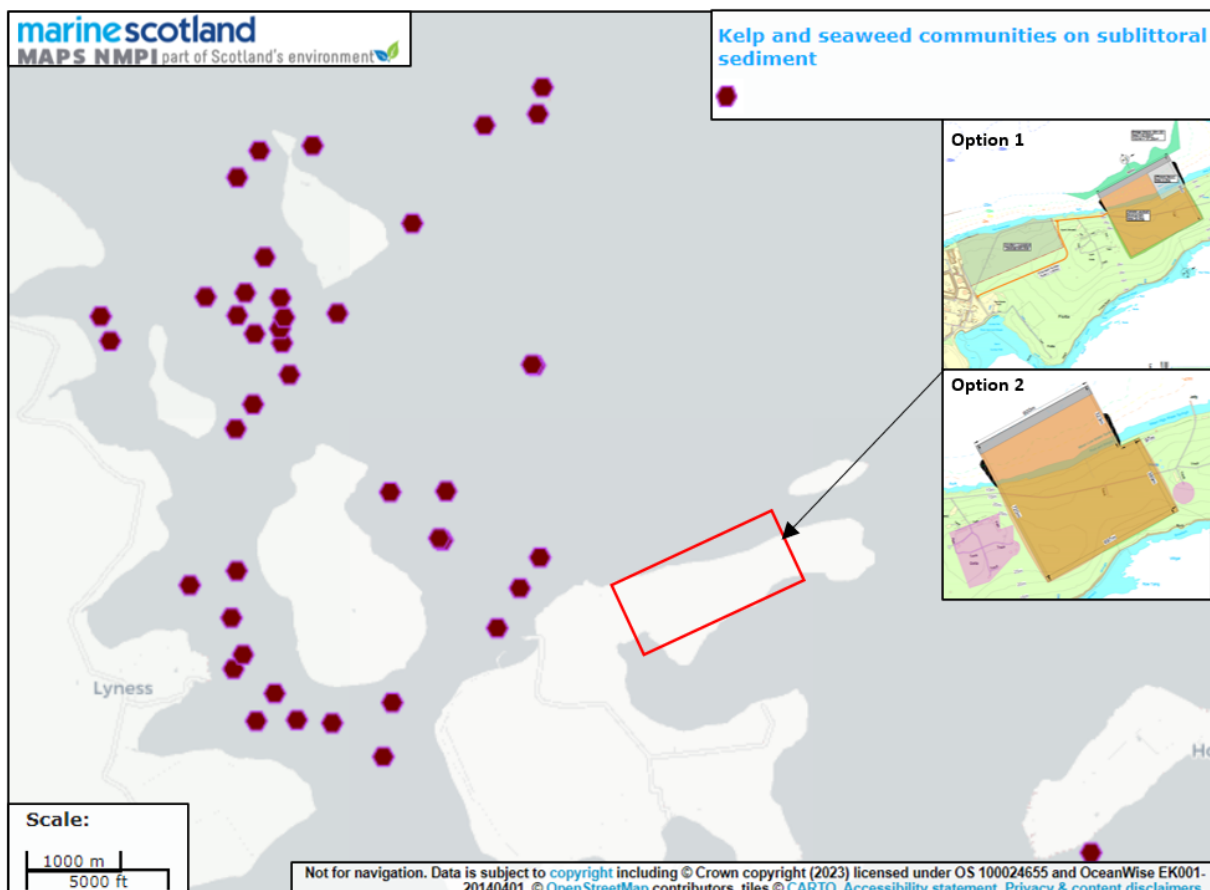


Figure 5-2: Distribution of Reef and Kelp and seaweed beds on sublittoral sediments near the Flotta development area (red).<sup>27</sup>

<sup>26</sup> Marine Scotland Kelp and Seaweed communities on sublittoral sediment, available at: <https://marine.gov.scot/information/kelp-and-seaweed-communities-sublittoral-sediment> last accessed 01/11/2023

<sup>27</sup> Image taken from the NMPI. Data is from the Geodatabase of Marine features adjacent to Scotland (GeMS) v10 (i26).

## Marine Non-Native Species (NNS)

No marine invasive non-native species have been recorded in Orkney, however a review of Orkney Islands Council Marine Non-native Species Monitoring Sites 2013-2019 identified a number (19) of non-native marine species throughout Orkney<sup>28</sup>. No surveys were completed within the area covered by the site, however three sites associated with Flotta, >2km west and south of the proposed development site were surveyed. It is considered that in Orkney marine NNS are most likely to establish on artificial man-made habitats (such as piers, harbour walls, buoys etc.) as opposed to those in the natural environment. Although the species recorded are not considered invasive, non-native species can have invasive tendencies. As such, on-going monitoring by Orkney Islands Council is well placed to detect any INNS if any were to be introduced.

## Marine Mammals

Marine mammals have been recorded throughout the year in Orkney waters, or at least recorded annually as seasonal visitors, based on a review of records available via the Sea Watch Foundation<sup>29</sup> & <sup>30</sup>, Whale and Dolphin Conservation<sup>31</sup>, The Hebridean Whale and Dolphin Trust<sup>32</sup>, Orcadian Wildlife<sup>33</sup>, Scottish Marine Animal Stranding Scheme<sup>34</sup> and Marine Directorate<sup>35</sup> (which includes data obtained from the Sea Mammal Research Unit at St Andrews University<sup>36</sup>).

All species of dolphin, porpoise and whale are European Protected Species (EPS). The marine mammal species most often encountered in the waters around Orkney, and therefore the most likely to suffer negative effects from the proposed development are listed below. All appear on the SBL (other than Grey Seal (*Halichoerus grypus*)) and the Orkney LBAP and Grey and Common seal (*Phoca vitulina*) are Annex II species:

- Harbour porpoise (*Phocoena phocoena*);
- Minke whale (*Balaenoptera acutorostrata*);
- Long-finned pilot whale (*Globicephala melas*);
- Killer whale (*Orcinus orca*);
- Risso's dolphin (*Grampus griseus*);
- White-beaked dolphin (*Lagenorhynchus albirostris*);
- Atlantic white-sided dolphin (*Lagenorhynchus acutus*);
- Grey seal; and
- Common seal.

Unusual cetacean sightings have included fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), Sperm whale (*Physeter macrocephalus*), Sowerby's beaked whale (*Mesoplodon bidens*), Cuvier's beaked whale (*Ziphius cavirostris*), Northern bottlenose whale (*Hyperoodon ampullatus*), short-beaked common dolphin (*Delphinus delphis*), Bottlenose dolphin

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<sup>28</sup> Marine Scotland Case Study: Marine non-native species monitoring in the Orkney Islands, available at: <https://marine.gov.scot/sma/assessment/case-study-marine-non-native-species-monitoring-orkney-islands> last accessed 03/11/2023

<sup>29</sup> Sea Watch Foundation Cetaceans of Orkney available at: 01/11/2023

<sup>30</sup> Sea Watch Foundation Recent Sightings Orkney available at: <https://www.seawatchfoundation.org.uk/recent-sightings/> last accessed 01/11/2023.

<sup>31</sup> WDC species guides available at: <https://uk.whales.org/whales-dolphins/species-guide/> last accessed 01/11/2023.

<sup>32</sup> HWDT sightings data available at: <https://whaletrack.hwdt.org/sightings-map/> last accessed 01/11/2023.

<sup>33</sup> Orcadian Wildlife information available at: <http://orcadianwildlife.co.uk/wPress/cetaceans-in-orkney/> last accessed 01/11/2023.

<sup>34</sup> Species reported within a 10km (sea route) from 2001-2020 to Scottish Marine Animal Stranding Scheme (SMASS) available at: <https://strandings.org/map/> last accessed 01/11/2023.

<sup>35</sup> Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals, Scottish Marine and Freshwater Science, Vol 8 No 25, available at: <https://data.marine.gov.scot/sites/default/files//SMFS%200825.pdf>

<sup>36</sup> St Andrews Sea Mammal Research Unit, available at: <http://www.smru.st-andrews.ac.uk/>

(*Tursiops truncatus*), False killer (*Pseudorca crassidens*), and Beluga (*Delphinapterus leucas*) and therefore are not considered to suffer negative effects from the proposed development.

### Designated haul-out sites for seals

A breeding colony seal haul out site for grey seals covers the site<sup>37</sup> & <sup>38</sup>. The location of the site with respect to the seal haul out sites is provided in Appendix F. The Calf of Flotta 760m north east is also a breeding colony seal haul out site for grey seals. Flotta Terminal located 550m west is a seal haul out site for common seals and North and East Fara is a seal haul out site for common and grey seals located 2.5km west.

### Fish Species

Basking shark (*Cetorhinus maximus*) have been recorded on multiple occasions in Orkney waters between 1980-2010 via Evans et al (2011)<sup>39</sup>, with the most recent and nearest records being 20km via The Shark Trust<sup>40</sup>. Basking shark are listed as endangered on the International Union for Conservation of Nature and Natural Resources (IUCN) Redlist<sup>41</sup>. They are afforded domestic protection under the Wildlife and Countryside Act and are UKBAP and Orkney LBAP species and therefore likely to suffer negative effects from the proposed development.

The Orkney coastline is well known for its Sea Trout (*Salmo trutta*) fishing and there are many commercial sea fish and diadromous fish (including Atlantic salmon (*Salmo salar*) and European eel (*Anguilla Anguilla*)) caught and/ or of high conservation value nationally and internationally in the area. Sea trout, Atlantic salmon and European Eel are UK BAP and Orkney LBAP species. There are no rivers designated for fish on Flotta but the development site may be on or close to a fish migratory path. Further baseline data on fish (including those which are Priority Marine Features (PMF)) will be collated for the EIAR.

Flapper skate are considered to be more sensitive and are less widely distributed than others. The Orkney Skate Trust (OST) have recorded positive records of live and spent flapper egg cases at a number of sites surveyed around Flotta, however, no surveys (and therefore no data) from the north side of the island (where the proposed development is situated) have been undertaken.

### Aquaculture

Multiple aquaculture sites are present around Orkney. An on-land aquaculture site is located on Flotta, approximately 1.8km south west of the proposed development site, for Sheepshead minnow (*Cyprinodon variegatus variegatus*), Turbot (*Scophthalmus maximus*) and Zebrafish (*Danio rerio*). The nearest water-based aquaculture site is Fara West located 6km north west of the site and farms Atlantic Salmon, Lump sucker (*Cyclopteridae*).

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<sup>37</sup> Scottish Government seal Haul-out maps available at: <http://www.gov.scot/Topics/marine/marine-environment/species/19887/20814/maps> last accessed 29/08/2023.

<sup>38</sup> Haul Out Maps available at: [https://webarchive.nrsotland.gov.uk/20180105052418mp\\_/http://www.gov.scot/Resource/0045/00454617.pdf](https://webarchive.nrsotland.gov.uk/20180105052418mp_/http://www.gov.scot/Resource/0045/00454617.pdf) last accessed 29/08/2023

<sup>39</sup> Evans, P.G.H., Baines, M.E. & Coppock, J. (2011). Abundance and behaviour of cetaceans and basking sharks in the Pentland Firth and Orkney Waters. Report by Hebog Environmental Ltd & Sea Watch Foundation. Scottish Natural Heritage Commissioned Report No.419

<sup>40</sup> The Shark Trust basking shark sightings available at: <https://www.sharktrust.org/basking-shark-project> last accessed 01/11/2023.

<sup>41</sup> IUCN Redlist available at: <http://www.iucnredlist.org/> last accessed 12/12/2022.

## 5.4 Potential Impacts (Construction)

To facilitate the proposed development, the project activities will include land clearance, dredging, controlled blasting, drilling, piling and other general construction activities. The following potential negative impacts on ecology could occur during the construction phase of the proposed development:

- Accidental pollution, disturbance or deterioration of Scapa Flow SPA and Golta Peninsula LNCS during construction activities;
- Permanent removal of small section of designated breeding colony seal haul out site and disturbance to breeding seals from September - December;
- Disturbance to and /or displacement of Scapa Flow and Hoy SPA qualifying species through construction and vessels movements;
- Terrestrial habitat loss or alteration which will lead to a loss of potential foraging, roosting, commuting and nesting opportunities for a range of faunal species;
- Loss or alteration of peat, SBL priority habitats degraded blanket bog, purple moor-grass and rush pasture, splash zone with lichens and soft rock sea cliffs and Annex I priority habitat dry heath – upland (H4030), which may result in a potential change of hydrological flow which may alter the composition of the habitats present;
- Intertidal, subtidal and marine habitat loss or alteration within and adjacent to the works including within the Scapa Flow SPA;
- Accidental spills from vessels, plant and on-site storage of fuels and chemicals leading to pollution of habitats and potential harm to a range of species and habitats;
- Increased airborne noise through construction activities (dredging, piling, blasting, plant movement, etc.) leading to disturbance and displacement of foraging, roosting, resting or nesting species;
- Increased visual stimuli through construction activities (personnel and plant movement, etc.) leading to disturbance and displacement of foraging, roosting or nesting species;
- Increased, and insensitive artificial lighting leading to disturbance and displacement of foraging, roosting, resting or nesting species;
- Presence of temporary new structures creating potential collision risk for a range of bird species;
- Loss of roosting and nest site opportunities during habitat removal/ alteration and loss of structures through construction works;
- Underwater acoustic noise and shock during piling, blasting, drilling or dredging leading to altered behaviour, this could include lethal and sub lethal impacts on marine mammals and their prey species;
- Seabed excavation works/ dredging during construction leading to disturbance of and potential loss of benthic communities and marine species, which in turn could lead to a reduction in or dispersal of prey items for a range of marine mammals and bird species;
- Temporary increase in suspended sediment and/or deposition from dredging and construction creating physical disturbance in the marine environment;
- Introduction or spread of marine NNS and/ or terrestrial INNS from increased numbers of vessels during construction; and
- Increased vessel numbers causing disturbance in the marine environment via collisions and underwater noise.

## 5.5 Potential Impacts (Operation)

During operational phase, there will be maintenance dredging and increase in marine traffic in addition to decommissioning activities that will be carried out on the proposed development. The following potential negative impacts on ecology could occur during the operational phase of the proposed development:

- Accidental pollution, disturbance or deterioration of Scapa Flow SPA and Golta Peninsula LNCS during operational activities;
- Disturbance to breeding seals in designated breeding colony seal haul out site from September – December;
- Disturbance to and /or displacement of Scapa Flow and Hoy SPA qualifying species through vessel movements;
- Accidental spills from vessels, plant and on-site storage of fuels and chemicals leading to pollution of habitats and potential harm to a range of species and habitats;
- Increased noise through operational activities (plant movement, etc.) leading to disturbance and displacement of foraging, roosting, resting or nesting species;
- Increased visual stimuli through operational activities (personnel and plant movement, etc.) leading to disturbance and displacement of foraging, roosting, resting or nesting species;
- Increased, un-natural lighting leading to disturbance and displacement of foraging, roosting or nesting species;
- Presence of new structures creating potential collision risk for a range of bird species;
- Introduction or spread of marine NNS and/ or terrestrial INNS from increased numbers of vessels during operation; and
- Increased vessel numbers post construction causing disturbance in the marine environment via collisions and underwater noise.

Considering the sensitivity of the area and type of activities to be carried out for the proposed development, there is a potential for significant effects during both construction and operational phase.

In terms of biodiversity, the area can be considered sensitive as the marine portion of the proposed development falls under Scapa Flow SPA and there are number of other designated sites within the study area.

## 5.6 Further Assessment and Design Mitigation

Full mitigation and enhancement measures will be determined through the EIA process following all appropriate ecological survey work identified. Good practice mitigation is however recommended in this Scoping Report based on the current level of available site information. NatureScot has been consulted for the ornithology survey methodology, Marine Mammal Risk Assessment (MMRA) methodology, and for the requirement of an EPS license for sub-bottom profiling with respect to Cetaceans.

### 5.6.1 Designated Sites

A Habitats Regulations Appraisal (HRA) will be undertaken to determine whether to proposed development could affect any European sites within 10km of the site, which would include considering whether the proposed development will have a 'likely significant effect' on a European site, and if so, an 'appropriate assessment' (AA) will be carried out.

### Mitigation

In-water works should be appropriately planned and include measures to prevent the release of contaminants (i.e. concrete, fuel etc.) into the Scapa Flow SPA. In order to prevent an accidental pollution event, the following mitigation should be implemented:

- Compliance with SEPA Guidelines for Pollution Prevention (GPPs)<sup>42</sup>;

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<sup>42</sup> SEPA (n.d.) Guidance Documents [online]. Available from: <https://www.sepa.org.uk/regulations/water/guidance/>

- Compliance with a suitable and site-specific construction environmental management plan (CEMP); and
- Compliance with a suitable and site-specific wastewater management plan (WMP), or similar, identifying how wastewater shall be managed to avoid pollution of the Scapa Flow SPA.

### **5.6.2 Other Designations**

The condition of the Golta Peninsula LNCS will be better understood following further survey work detailed in 11.6.2 and ascertain the need to avoid and preserve specific areas.

#### **Mitigation**

The following general mitigation measures should be followed in relation to all terrestrial fauna:

- Care must be taken during clearance/groundworks/water removal to ensure wildlife is not harmed. In the event any protected species are found when and Ecological Clerk of Works (ECoW) is not in attendance, works must stop, the animal must not be handled and the ECoW contacted immediately;
- Any excavations must be covered at night wherever practical. Where excavations are left open, a means of escape must be provided in the form of a ramp to allow trapped fauna to escape;
- Excavations must be managed to avoid the formation of temporary waterbodies; and
- All temporarily exposed pipes must be capped overnight to prevent animals gaining access and later becoming trapped.

### **5.6.3 Terrestrial Habitats and Species**

To better understand the sensitive habitats on site, a National Vegetation Classification (NVC) survey during optimal survey season (Jun-August) will be undertaken to identify any priority or groundwater dependent habitats and ascertain the need to avoid and preserve specific areas.

A targeted otter survey will also be required.

Habitat loss impacts on terrestrial habitat should be mitigated by design. Good practice mitigation measures should be recommended to minimise the impacts of construction and specific operation activities on terrestrial habitats and species through avoidance, retention, and replacement.

#### **Mitigation**

Mitigation measures detailed in section 5.6.2 are relevant to terrestrial habitats and fauna and as such should be followed.

#### **Terrestrial INNS**

Terrestrial INNS will be considered during the EIA and mitigation to manage the spread and introduction during construction and operation should be devised in accordance with relevant guidance.

### **5.6.4 Birds**

The proposed area of terrestrial works is within heathland, bog and wetland habitats which offer a range of nesting and foraging opportunities for a range of species.

The proposed area of the development within Scapa Flow has the potential to impact upon a wide range of protected species and those qualifying species of the Scapa Flow SPA, particularly during the winter months when the birds are present.

From consultation with NatureScot<sup>43</sup>, the following surveys will be undertaken to better understand the usage of the proposed site and to ensure any disturbance or displacement to nesting, foraging or roosting birds is minimised during construction and operation.

### **Vantage Point (VP) Watches**

It is proposed that a series of vantage points are used in order to collect data of all (or the majority of) inshore waters within 2km, as well as likely shipping channels to be used within 2km of the Proposed Development. This will provide a quantified and descriptive assessment of bird usage around the site and particularly designated site qualifying bird species activity on the Flow within 2km of the Proposed Development.

The VP surveys will be undertaken over a spread of the full daylight period available (from official local sunrise to sunset times) and also through a range of tide heights and sea states. Care will be taken to ensure an even spread of rising and falling tidal states throughout the survey period.

From each VP, the visible sea area within a 180° arc up to 2km will be divided radially into sectors. This area will be scanned for target species over a (maximum) 2-hour period, with all bird activity recorded. Where vantage point viewsheds overlap, counts from one vantage point will be used to avoid double counting. If small areas of inshore waters are not covered by a 180° arc, these will be subject to counts to record birds within these areas. This would include the waters at Pan Hope. These areas would be classed as their own sectors.

By splitting the VP viewing arc into sectors, data results in the form of heat maps will be produced.

Ideally, counts from each vantage point will be undertaken over one day, but this is unlikely to be achievable during some of the winter months. Each VP will be counted by scanning at least twice across it. Eight counts from each vantage point will be undertaken each month during the winter 2023/24 period (October to March).

Due to the proximity of Hoy SPA, there is the potential for the inshore waters around the Proposed Development to be used by feeding Red-throated Diver during the breeding season. In addition, some of the qualifying species for Scapa Flow SPA (in particular Great Northern Diver) are still present until late April. Therefore, vantage point surveys will continue between April and September 2024. Two visits to each vantage point will be undertaken between April and September 2024.

### **Bird/Boat Interactions**

During vantage point watches, observations of bird behaviour from boat/vessel movements will be undertaken on an ad-hoc basis. These will detail bird (qualifying species of the Scapa Flow SPA) responses to vessel movements to gain an understanding of current baseline levels.

### **Breeding Bird Surveys**

Historically, Flotta has been known to support breeding populations of both Arctic and Great Skuas. Therefore, the onshore area (plus a 500m buffer) will be walked three times during the breeding season (late April to end of June 2024) to record breeding birds. The route walked will be varied between visits,

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<sup>43</sup> E-mail received from NatureScot on 27th Oct 23 and 09th Nov 23



but always approach to within about 100 m of every point on the ground. The start point and overall direction will also be varied.

## **Mitigation**

Given the protection afforded to all nesting birds, any removal of vegetation or features supporting nesting birds should be undertaken during September to February (inclusive) outside of the main bird breeding season. If any active bird's nests are found, works must stop in the area and an appropriate buffer zone (as determined by the ecologist, usually approximately 5m) must be established around the nest. The buffer must remain intact and the nest undisturbed until it has been confirmed that the young have fledged, and the nest is no longer in use.

## **5.6.5 Marine Habitats, Mammals and Fish**

### **Habitats**

Intertidal, subtidal, and benthic surveys will be undertaken to gain a better understanding of the marine habitat types present within the site boundary and to ascertain the presence of any Annex 1 habitats or PMFs.

In general, intertidal surveys involve a walkover survey during low tide to search and record intertidal epifauna and invertebrate infauna, to species level as appropriate, to allow for accurate community classification, following standard methodologies (e.g. JNCC<sup>44</sup>). Maps of Annex I habitats will be provided.

In general, subtidal, and benthic surveys involve surveys to search for key protected habitats and the infaunal (within sediments) and epibenthic (on the seabed) communities they support. This can be undertaken via a range of sampling methods (e.g. sediment sampling (grab sampling, cores, dredging), video and photograph collection, side scan sonar (SSS) and multibeam echosounder (MBES) mapping techniques), etc.). Marine fauna identification, processing and interpretation of results will be provided as well as an relevant maps.

### **Marine NNS**

Any marine NNS should be considered during the sub-tidal habitat surveys. Appropriate mitigation measures should be devised for managing the spread and introduction of marine NNS during construction and operation and detailed biosecurity plans created in accordance with relevant guidance.

### **Mammals and Fish**

A detailed review of information available on marine mammals, basking sharks, flapper skate, other marine fish (including commercial fisheries) and diadromous fish will be undertaken to gain a better understating of those species which may be impacted by the proposed development during the construction and operational phases. Only species considered to be regularly present in Orkney waters will be taken forward for further assessment. Thus, marine mammals which are considered unusual sightings have been scoped out of further assessment.

Underwater noise modelling for construction activities will be carried out, focussing on the key species above (including fish species). Potential impacts on marine mammals, basking sharks and other marine fish species will be assessed within a Marine Mammal Risk Assessment. Any additional mitigation will be

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<sup>44</sup> <https://data.jncc.gov.uk/data/3e8b58d8-ff6b-4bc6-ba4f-aeed92710e14/SSSI-Guidelines-1b-MarineIntertidal-ShallowSubtidal-2019.pdf>

designed to be site and species specific, taking into account the additional noise producing activities occurring in Scapa Flow.

The Joint Nature Conservation Committee (JNCC) Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (2010)<sup>45</sup> will be consulted to design a site-specific mitigation protocol, if required.

Mitigation proposals will be agreed through discussion with NatureScot and Marine Directorate to ensure they provide the appropriate protection for marine mammals during construction, and it may well be necessary to apply for an EPS licence from the licensing authority, Marine Directorate, prior to commencing construction works.

## Mitigation

- A marine mammal protection plan will be produced and implemented, following 'The Statutory Nature Conservation Agency Protocol for Minimising the Risk of Injury to Marine Mammals from Piling Noise'<sup>46</sup> and employing a Marine Mammal Observer prior to the commencement of works.
- Any use of an intake pump to remove water should be screened to prevent fish from being injured. Where appropriate, measures should be implemented for any fish rescue within the confines of dry working area.

## 5.7 Inclusion to EIA

- Scapa Flow SPA and Flotta Peninsula LNCS
- Terrestrial Habitats and Species
- Terrestrial INNS
- Birds
- Marine habitats
- Marine NNS
- Marine mammals
- Basking shark
- Flapper skate
- Other fish (including marine, diadromous, and commercial fisheries)
- Underwater Noise

## 5.8 Assessment Methodology

The methodology for the Ecological Impact Assessment (EiA) will follow the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Version 1.1 (CIEEM, 2018 (updated 2019)). The British Standard for Biodiversity: Code of Practice for Planning and Development (BS 42020:2013) cites the CIEEM EiA Guidelines as the acknowledged reference on ecological impact assessment. The guidelines are consistent with the British Standard, which provides recommendations on topics such as professional practice, proportionality, pre-application discussions, ecological surveys, adequacy of ecological information, reporting, and monitoring.

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<sup>45</sup> JNCC Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (2010) available online: [http://jncc.defra.gov.uk/pdf/JNCC\\_Guidelines\\_Piling%20protocol\\_August%202010.pdf](http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Piling%20protocol_August%202010.pdf) last accessed 01/11/2023

<sup>46</sup> JNCC. (August 2020). Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. [Online] Available from: [jncc.gov.uk](http://jncc.gov.uk) (Accessed May 2022)

The assessment will include all direct and indirect, lethal, and non-lethal impacts on ecology that could reasonably occur during construction work and in operation of the development.

A standalone Preliminary Ecological Assessment (PEA) and National Vegetation Classification (NVC) Report will be produced for the site to provide an updated assessment in relation to current site condition.

## **6 AIRBORNE NOISE**

### **6.1 Introduction**

The section relates with the airborne noise aspects and identifies any relevant potential significant effect associated with the proposed development.

### **6.2 Study Area**

The study area will be limited up to 2 km from the proposed development site.

### **6.3 Baseline Conditions**

#### **6.3.1 Existing Sources**

The proposed development site is located on an island, influenced by maritime weather conditions. The only industrial activity is the existing Flotta Terminal, which is located to the west of the proposed UDWQ. The noise environment at the site is considered to be predominantly characterised by natural sounds (i.e. waves, wind, birds) punctuated with man-made sound from Flotta Terminal and shipping movements.

#### **6.3.2 Noise Sensitive Receptors**

The study area lacks any significant human habitation. There are some scattered residential areas to the south and southeastern side of the site on Flotta, across Pan Hope from the Golta Peninsula. The nearest Noise Sensitive receptor (NSR) is located approximately 1.4 km south of the proposed UDWQ (Refer Appendix D).

NSRs to the south of Pan Hope have unbroken line of sight to Flotta Terminal. The natural topography of the Golta Peninsula prevents views of its north coast when viewed from Flotta across Pan Hope, with only the south coast visible from this vantage point, as confirmed by viewshed analysis.

Flotta Surgery is located approximately 1.8 km southwest of the proposed UDWQ site. Flotta primary School is located approximately 1.9 km southwest of the proposed UDWQ site.

The proposed development site is located in a Local Nature Conservation Site and Seal haul-out site. The entire Flotta island is surrounded by Scapa Flow SPA and the marine portion of the proposed development falls under Scapa Flow SPA.

### **6.4 Potential Impacts**

Construction of the proposed UDWQ will include land clearance, excavation, drilling, controlled delayed blasting, stockpiling of earthen material, construction activities and vehicular movements that may lead generation of noise.

During the construction phase, excavation of the landform from the north will reinforce the natural masking effect of the topography and prevent noise from propagating southwards. The platform level of

the laydown area shall be constructed to match the level of the ultra-deep water quay which is proposed to be approximately 7m Above Chart Datum (ACD). The laydown area will slope upwards to the south with a maximum ground height expected to be approximately 15m ACD where the existing landform height is approximately 20m ACD.

Noise generating activities which shall be carried out during the operational phase include Deep-water ship berthing and mooring, Ship loading / unloading activities, including operation of cranes, Movement of materials between ships and laydown area, Construction / assembly and maintenance of offshore wind turbines and Plant movements within quay and laydown area.

The construction and operational noise might disturb the residents at distances of 1.4km or greater with limited or broken line of sight.

## **6.5 Inclusion or Exclusion from EIA**

Based on the above information, it is proposed to include Airborne Noise Assessment for the construction and operational phases in the EIAR for consideration of potential impacts on waterbirds in the surrounding area. Consideration of airborne noise impacts on human receptors is proposed to be excluded from the EIAR. Underwater noise is addressed in Chapter 5 (Biodiversity).

## **6.6 Assessment Methodology**

The potential for impact upon avian receptors will be assessed in accordance with guidance contained within Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance (2009) and the Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects (2013), both prepared by the Institute of Estuarine and Coastal Studies.

### **6.6.1 Baseline Noise Monitoring**

It is proposed to carry out existing baseline noise monitoring, the results of which shall be used to determine the sensitivity of avian receptors alongside calculated predicted levels in the assessment of construction and operational noise impacts.

The existing baseline noise monitoring shall comprise of the following stages;

1. Measurement of existing baseline environment at a sample of 1 or 2 locations considered to be representative of the most exposed areas surrounding the site. The location of the proposed monitoring locations will be confirmed through consultation with OIC and MD-LOT;
2. The monitoring shall be carried out during week days and nights, and repeated at each position on more than one date; and
3. The monitoring is likely to incorporate a mixture of attended and unattended monitoring, allowing subjective observations to be noted at each position and considered period.

### **6.6.2 Construction Noise**

The noise from construction activities has the potential to impact upon avian receptors in the area. Construction details have not been finalised at this stage. The degree of impact during each phasing stage will depend upon:

1. The nature of construction activities being carried out; this includes the type and size of machinery/plant involved, combinations of activities occurring simultaneously and HGV routes in and around the site;
2. Location of construction activities relative to the closest noise sensitive receptors;
3. Duration of proposed activities;
4. Construction site operating times; and
5. Extent of noise mitigation measures in place.

Noise from construction activities shall be predicted following guidance provided in *BS5228-1:2009; Code of Practice for Noise and Vibration Control on Construction and Open Sites*. Predicted increases in levels above baseline shall be assessed in order to determine the significance of effects. The results of the assessment can be used to inform a construction noise management plan to help mitigate any adverse impacts.

The construction noise assessment sites shall comprise of the following stages;

1. Review of construction activities, locations and noise data;
2. Calculation and assessment of construction noise in accordance with BS5228-1:2009; Code of Practice for Noise and Vibration on Construction and Open Sites. A combination of calculation and 3D computer noise modelling using CadnaA software shall be used in the compilation of noise contours for the area surrounding the development site and to determine noise impacts upon avian receptors;
3. Only significant noise generating construction stages shall be considered within the above assessment; and
4. If required, recommend mitigation measures to reduce construction noise impact upon avian receptors and to inform construction noise management plan.

### **6.6.3 Operational Noise**

Predicted increases in levels above baseline shall be assessed in order to determine the significance of effects upon avian receptors. The results of the assessment can be used to inform operational noise mitigation measures to be employed at the site and if required, to inform the heights of the proposed bunds surrounding the laydown area. Noise control at source is anticipated to be most important given the flight paths of birds will render physical mitigation measures such as barriers and bunds redundant.

The operational noise assessment shall comprise of the following stages;

1. Review of proposed operational activities, locations and noise data;
2. Prediction of operational noise from proposed development using CadnaA 3D noise modelling software to compile noise contours for the area surrounding the development site and to determine noise impacts upon avian receptors; and
3. If required, make recommendations on mitigation measures to reduce any operational noise impact upon avian receptors and to inform operational noise management plan.

## 7 ARCHAEOLOGY AND CULTURAL HERITAGE

### 7.1 Introduction

The section relates with the archaeological and cultural heritage aspects and identifies any relevant potential significant effect associated with the proposed development.

### 7.2 Study Area

The study area will be limited to 2 km from the proposed development site.

### 7.3 Baseline Conditions

#### 7.3.1 Scheduled Monuments

Scheduled monument is any monument which is for the time being included in the Schedule as per Ancient Monuments and Archaeological Areas Act 1979 which makes provision for the investigation, preservation and recording of matters of archaeological or historical interest and (in connection therewith) for the regulation of operations or activities affecting such matters.

There are four scheduled monuments within the study area with two of them adjacent to the Proposed development site. The details of each of them is provided below. The locations of the monuments with respect to the proposed development site is provided in Appendix D.

#### **Golta, World War II Z Battery and Light AA Battery, Flotta**

The monument is of national importance because it is the best-preserved Z battery (multiple rocket launcher site) in the British Isles and a rare example of a surviving decoy light anti-aircraft battery. It also has associated camp buildings.

The Z battery comprises a regular grid of 64 rocket launchers and 128 magazines with the outlying remains of what are interpreted as four personnel shelters and a command post. The command post is now partially collapsed, but it was of panelled concrete slab construction with an entrance in a side wall. The ammunition shelters are constructed of inner corrugated sheeting with raked walls infilled with bags of concrete. This was a part of the curtain of defences protecting the Lyness naval base and a part of what was one of the most heavily defended areas in the UK during the Second World War.

To the East of the Z battery is a dummy light anti-aircraft battery with five circular emplacements.

#### **Roan Head, World War II Balloon Barrage site, 290m SW of, Golta**

The monument is of national importance because it is the best-preserved balloon barrage site in the Orkney Islands, one of the few places in the British Isles where such sites have survived at all, because of their vulnerability elsewhere to damage from, for instance, ploughing.

The monument comprises a large Second World War balloon barrage site situated on the Golta Peninsula, Flotta, a heather-covered headland on which many First and Second World War military remains survive.

The central mooring bolt and four concentric mooring rings can be traced on the ground (c. 60m maximum diameter). From each opposed quarter an open-ended rectangular structure (now surviving as turf-covered collapsed walls) opens from the outer ring towards the centre; these would have housed the winches for the balloon. Little of this is immediately obvious on the ground: the mooring rings are first noticed as slightly lighter patches in the vegetation.

The area to be scheduled is a circle of diameter 100m centred on the mooring bolt, to include all elements of the balloon barrage site and an area around in which evidence relating to its construction and use may survive.

### **Roan Head, coastal battery and camp (WW1)**

This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, specifically, the network of defences constructed in the First World War to defend the key strategic harbour at Scapa Flow.

The monument is the remains of a coastal artillery battery and associated accommodation camp, established in 1915 and used during the First World War. It is visible as a series of upstanding concrete structures, with associated earthwork and concrete remains. It forms part of a network of coastal batteries built to defend the key strategic harbour of Scapa Flow: this battery was one of six covering the southern approaches to Scapa Flow. It is located on the coast at Roan Head at around 10m above sea level, overlooking the Sound of Hoxa to the SE.

The main battery comprises four-gun emplacements, together with a magazine, access trenches with traverses and a number of ancillary and support structures surviving as earthworks and concrete bases.

The scheduled area is irregular on plan to include the remains described above and an area around them within which evidence relating to the monument's construction and use is expected to survive, as shown in red on the accompanying map. The scheduling specifically excludes the above-ground elements of all post-and-wire fences in the area and the above-ground elements of the modern shipping beacon to allow for their maintenance.

### **Buchanan Battery, Stanger Head**

Buchanan Battery forms part of Kenzies Tower, II. No major details are available for the monument.

## **7.3.2 Listed buildings**

Listed building is a building which is for the time being included in a list compiled or approved by Historic Environment Scotland as per Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 that has certain enactments relating to special controls in respect of buildings and areas of special architectural or historic interest.

There is only 1 listed building in the study area, namely Flotta (Hoy), Whome Kiln and Barn. The locations of the listed building with respect to the proposed development site is provided in Appendix D.

### **Flotta (Hoy), Whome Kiln and Barn**

The kiln was a characteristic feature of the traditional Orkney farm and thus, although redundant in use, Whome Kiln remains as an important survival from earlier Orkney farming practices. The threshing barn has been little altered; the threshing doors remain aligned and it is currently used for storage, however the range to the NE which is present on the 1st Edition OS map, no longer remains. The door alignment helped to create a through-draught and thereby aided the separation of grain from chaff whilst hand



flailing. The kiln was then used to dry the corn before grinding and may also have been used for drying malt for making ale. The associated buildings are excluded from listing.

### **7.3.3 Other Designated Heritage Assets**

There are no World Heritage sites, Gardens and Designed Landscapes, Historic Battlefields, Conservation Areas, or Historic Marine Protected Areas within the study area.

### **7.3.4 Canmore Assets**

Canmore assets within the study area are listed in Appendix C.

## **7.4 Potentially Significant Effects**

There are four scheduled monuments within the study area with two of them adjacent to the proposed development site. The proposed development includes excavation, drilling and controlled delayed blasting during construction phase that might result in structural damage to the monuments or their settings. Also, the proposed developed blocks the only access route to these scheduled monuments.

There is potential for significant effects on unknown prehistoric heritage assets, which should be scoped into an EIA, and a negligible likelihood for any impacts on unknown medieval, post-medieval and modern assets, which are scoped out. Mitigation strategies prior to and during construction could reduce or eliminate such effects. Such strategies would include a walkover survey as part of the EIA in order to identify if any remains are visible, intrusive archaeological evaluations prior to construction and an archaeological watching brief during construction could reduce or eliminate such effects. If such strategies are agreed prior to the EIA process then there would be no requirement to include impacts on unknown prehistoric heritage assets in an EIA process, because the necessary mitigations to reduce/eliminate impacts would already be in place. Management of the risk is likely to be part of planning consent conditions.

## **7.5 Inclusion or Exclusion from EIAR**

Based on the above, it is proposed to include Archaeology and Cultural heritage impact assessment for the construction phase in the EIAR. The assessment will also include a vibration assessment to identify potential significant impacts on the scheduled monuments.

## **7.6 Assessment Methodology**

The assessment methodology will be based on the following framework.

1. Consultation Responses: All the preliminary consultation responses received during the scoping stage will be reviewed and relevant information will be incorporated into the assessment.
2. Study Area: An appropriate study area will be identified taking into consideration the footprints of the proposed development, sensitivity of area and potential environmental effects due to the proposed developmental activities.
3. Baseline Studies: Identification and review of current status of designated sites/areas, sensitive receptors and geographical features within the study area will be undertaken.

4. Impact Assessment: Potential environmental impacts will be identified taking into consideration the proposed developmental activities. Once identified, assessment will be carried out to understand the significance of those impacts.
5. Mitigation Measures: If any significant impact is identified, then appropriate mitigation measure will be proposed to nullify or reduce the impact.
6. Monitoring Measures: Where appropriate, measures for the monitoring of mitigation measures and the proposal should be presented to ensure that mitigation is enacted effectively and that the actual impacts are consistent with the predicted impacts.

## 8 SEASCAPE, LANDSCAPE AND VISUAL

### 8.1 Introduction

The section relates to the seascape/landscape and visual aspects; and identifies any relevant potential significant effect associated with the proposed development.

### 8.2 Study Area

The study area considered for the EIA scoping is limited to 15 km from the proposed development site. The study area will be revised based on the Zones of Theoretical Visibility Assessments (ZTVs) during the EIAR.

### 8.3 Baseline Conditions

#### 8.3.1 National Scenic Area

The Planning etc. (Scotland) Act 2006 and Town and Country Planning (National Scenic Areas) (Scotland) Designation Directions 2010 defines National Scenic Areas. The legislation defines NSAs as areas “of outstanding scenic value in a national context”, for which special protection measures are required.

#### Hoy and West Mainland NSA<sup>47</sup>

Hoy and West Mainland NSA is approximately 7.2 km to the northwest from the proposed development site. The location of the NSA with respect to the proposed development site is provided as Appendix G.

The great ice-rounded eminences of the hills of North Hoy dominate the Orkney scene with a power that is scarcely in tune with their modest height (479 metres). Their bold shape, fine grouping, soaring cliffs, and headlands, including the famous stack of the Old Man of Hoy, are almost as important to the Caithness scene as they are in that of Orkney.

North Hoy has a particularly strong visual inter-relationship with the south-west mainland of Orkney, the pastoral character of which around the shores of the Loch of Stenness makes a good foil for the bold hills of Hoy. The basin of this loch is enclosed by low rolling hills of lush grassland, some arable land, scattered farm steadings and stone dykes with a noticeable lack of trees, giving a very open landscape, the character of which is enlivened by the abundant remains of ancient occupation.

This landscape culminates in the west in cliffed headlands like a rampart against the sea, which breaks through at Hoy Sound in a tidal race of impressive swiftness. The stone-built settlement of Stromness rising steeply out of its harbour further enhances the character of the area.

The Special Qualities of the Hoy and West Mainland National Scenic Area are as follows:

- A palimpsest of geology, topography, archaeology, and land use.
- An archaeological landscape of World Heritage Status.
- The spectacular coastal scenery.

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<sup>47</sup> SiteLink (nature.scot)

- Sandstone and flagstone as an essence of Orkney.
- A long-settled and productive land and sea.
- The contrast between the fertile farmland and the unimproved moorland.
- A landscape of contrasting curves and lines.
- Land and water in constantly changing combinations under the open sky.
- The high hills of Hoy.
- The townscape of Stromness, its setting, and its link with the sea.
- The traditional buildings and crofting patterns of Rackwick.

### **8.3.2 Other designations**

There are no National Parks, Regional Parks, or Country Parks within the study area.

### **8.3.3 NatureScot National Landscape Character Assessment**

With reference to the NatureScot National Landscape Character Assessment, the site falls under 'Low Moorland' category.

Key characteristics of the landscape are as follows:

- Low undulating hill or slightly domed moorland usually adjoining lower pastures.
- Unenclosed heather moorland, and maritime heath at the coast.
- Floral diversity and sea birds.
- Uninhabited and mainly lacking roads and tracks.
- Occasional prominent historical structures in the open landscape.
- Mainly dark brown vegetation with seasonal variation in colours.
- Contrast with adjoining green enclosed pastures.
- Sense of remoteness and wildness in many areas.

### **Landform**

Low Moorland typically occurs on low hilly headlands up to 50 metres above sea level and has a gently rolling or gently domed topography. In some areas the underlying strata provides detailed relief under thin deposits, such as on Papa Westray. This type is often distinct in its disassociation with higher moorland areas and usually adjoins lower, pastoral land. The convex shaped coastline often has a narrow edge with low, inclined, or vertical cliffs of layered rocks, with occasional geos (coastal clefts). In places the slopes incline more gently down to the sea. On southerly orientated headlands on Stronsay and East Orkney Mainland, wave action has produced shingle ayres (sand or shingle bars).

### **Landcover**

The underlying glacial till has a covering of peat deposits in the larger areas of this type. Soils are usually peaty with vegetation of mostly heather moorland with some rough grassland. Areas of semi-improved or improved grassland occur on the sheltered or inland edges, where they merge with adjoining pastures. West facing coastlines are prone to soil stripping by wave spray erosion which has occurred on Papa Westray. In coastal margins the local effects of the sea are noticeable in the presence of maritime heath and the abundance of sea birds, for example at Mull Head on Papa Westray, and Mull Head on East Orkney Mainland.

Land use is usually unenclosed rough grazing, with peripheral areas of enclosed pastures. Peat cutting occurs, although it is usually local in scale. Most of the Flotta moorland has been extensively cut in the past and is covered in re-vegetated strips.

## Settlement

Prehistoric archaeological sites are infrequent. North Hill on Papa Westray includes many burial mounds, and there is an impressive Neolithic chambered cairn, known as the North Cairn, to the west of Savenick on the Mainland. There are visible remains of abandoned enclosures, field systems, boat nausts (coastal boat shelters of Norse or 19th Century origin) and kelp pits.

Today settlement is mainly absent, as are roads, with the exception of 20th Century military infrastructure around the coastline of Flotta. However, given the importance of Scapa Flow as an anchorage for the Grand Fleet in the First World War and the Home Fleet in the Second World War, Flotta was home to significant numbers of servicemen in the early to mid-20th Century. Their presence is evidenced by the various military camps and installations across Flotta. During the First World War a boxing match on the island was attended by around 10,000 soldiers and sailors. These prominent headlands are strategically located for coastal defences protecting Scapa Flow, such as at Innan Neb, Flotta. These locations are also ideal for Ordnance Survey Triangulation Pillars and lighthouses, which according to their function tend to be placed in the most visible location. Flotta's air strip, built to service the nearby oil terminal, which lies along the coast, fell out of use late in the 20th century.

## Perception

The landscape colours tend to be dark browns most of the year, and seasonally vibrant when the heather and maritime grassland are in bloom. The abrupt, often linear boundary with green, enclosed pastures highlights the contrast with moorland. Structures are prominent in these open landscapes both from within the type and adjacent islands. Some remote locations lacking built features and tracks have a sense of wildness, which is strengthened by the sight and sounds of birds and the sea, and the presence of abandoned structures.

### 8.3.4 Visual Receptors

Visual receptors are the people who could be affected by the changes in views resulting from the proposed development. Visual receptors include:

- Residents within the study area having direct view of the site - There are residential properties on the Flotta island and nearby islands which might experience the visual impacts due to the proposed development.
- People travelling through the area - Though there is no major road passing by the Proposed development site, but the location of the proposed development is near a major shipping route with considerable amount of marine traffic.
- People visiting the area - There are several recreational, historic, and scenic locations in the study area, and it is assumed that the area could be receiving a significant number of visitors.

## 8.4 Potentially Significant Effects

The construction phase of the proposed development is expected to last approximately 36 months, and could result in visual effects due to construction activities. In addition, the proposed development could influence coastal and landscape character permanently and this could result in significant landscape and visual effects. It should however be noted that the proposed UDWQ is adjacent to the Flotta terminal, which is industrial (in the north of the island).

## **8.5 Inclusion or Exclusion from EIA**

With reference to the above information, Seascape/Landscape and Visual Impact is proposed to be scoped in the EIAR.

## **8.6 Assessment Methodology**

The methodology for conducting SLVIA will be based on “Guidelines for Landscape and Visual Assessment 3rd Edition” Landscape Institute and Institute of Environmental Management and Assessment 2013 (GLVIA3). The process includes the following key stages:

1. Consultation Responses: All the preliminary consultation responses received during the scoping stage will be reviewed and relevant information will be incorporated into the assessment.
2. Study Area: An appropriate study area will be identified taking into consideration the footprints of the proposed development, sensitivity of area and potential environmental effects due to the proposed developmental activities.
3. Baseline Studies: Identification and review of current status of designated sites/areas, sensitive receptors and geographical features within the study area will be undertaken.
4. Impact Assessment: Potential environmental impacts will be identified taking into consideration the proposed developmental activities. Once identified, assessment will be carried out to understand the significance of those impacts.
5. Mitigation Measures: If any significant impact is identified, then appropriate mitigation measure will be proposed to nullify or reduce the impact.
6. Monitoring Measures: Where appropriate, measures for the monitoring of mitigation measures and the proposal should be presented to ensure that mitigation is enacted effectively and that the actual impacts are consistent with the predicted impacts.

## **9 CLIMATE CHANGE**

### **9.1 Introduction**

The section relates to the carbon, climate change and greenhouse gases aspects and identifies any relevant potential significant effect associated with the proposed development.

### **9.2 Climate Change and Resilience**

As per IEMA guidance related to Climate Change Resilience & Adaptation, factors to consider when assessing the risks to a project are:

1. Its reliance on interconnected networks (be this a transport network, power supplies or telecoms for example),
2. Its vulnerability to the impact of weather on both normal operations and extreme weather-related disaster scenarios.

The proposed development is located on a coastal area, and it might be susceptible to coastal flooding. The probability of occurrence of any other extreme weather event and any induced impact on the proposed development directly or indirectly is unlikely.

The impact of coastal flooding will be addressed in 'Water Environment' section of the EIAR.

### **9.3 Carbon and GHG emissions**

Similar to any development project, the proposed development will have some Greenhouse Gas (GHG), and carbon emission associated with it. To understand the GHG and carbon emissions related to the construction phase of the proposed development, a carbon impact assessment will be carried out. This assessment will calculate the embodied carbon of the construction materials used for the development, emission from construction machinery and emission from transportation of the construction materials.

The baseline considered will be the 'business as usual' scenario. It considers the carbon emission without the proposed development at the site.

The study area for the assessment incorporates a broader scope than the site boundary due to the consideration of embodied carbon emissions from materials, the transportation of materials to site and installation processes on site.

### **9.4 Potentially Significant Effects**

There will be various developmental activities that contribute to the GHG and carbon emissions and will be included in the assessment such as

- Land clearance will result in loss of carbon sink as the soil found on the site is peat and peaty podzol that are considered to be important in terms of carbon sink.
- Concreting, piling and metal work will be major part of the construction of the proposed development and hence the embodied carbon emission associated with those materials will be significant.

- Being in a remote location, most of the materials used for the proposed development will be transported from remote locations and this will result in transportation emissions.

## **9.5 Inclusion or Exclusion from EIA**

Considering the above information, 'Climate Change and Resilience' is proposed to be scoped out, but the 'Carbon Impact Assessment' is proposed to be scoped in from the EIAR.

## **9.6 Assessment Methodology**

Carbon Impact Assessment will be undertaken through calculating of GHG emission following the IEMA's six steps framework for a GHG emissions assessment.

1. Set the scope and boundaries of the GHG assessment.
2. Develop the baseline.
3. Decide upon the emissions calculation methodologies.
4. Data collection.
5. Calculate/determine the GHG emissions inventory.
6. Consider mitigation opportunities and repeat steps 4 & 5.



## **10 TRAFFIC, SHIPPING AND NAVIGATION**

### **10.1 Introduction**

The section relates with the traffic, shipping and navigational aspects and identifies any relevant potential significant effect associated with the proposed development.

### **10.2 Baseline Conditions**

Flotta Island is well connected with the mainland Orkney Island and Hoy through ferry services. The Flotta ferry terminal connects to Houton ferry terminal on the Orkney mainland and Lyness ferry terminal and Longhope ferry terminal on the Hoy Island.

An access road is proposed which navigates from existing flare stack area, around wind farm sub-station location to new site. It is detailed on the layout as provided in Annexure A.

There are three scheduled monuments on the Golta peninsular having limited access with just one route that navigates through the Proposed development site.

### **10.3 Potentially Significant Effects**

The construction phase of the project will last for approximately 36 months and all the construction material and resources will be mostly imported via sea route and may increase marine traffic in the area.

Once operational, the UDWQ will be used for decommissioning, etc, there is potential for an increase in marine traffic in the wider area however, vessel movements will be determined on a project by project basis during the operational phase.

As the project layout hinders the only access route to the scheduled monuments, a separate access route will be prepared for those monuments by the applicant. The remote project location will be not have any impact on road infrastructure used by local residents. Increase in marine traffic during construction and operational phase has potential for significant effects.

### **10.4 Inclusion or Exclusion from EIA**

Based on the above information, it is proposed to include Shipping and Navigation but exclude Traffic Assessment from the EIAR.

### **10.5 Assessment Methodology**

The assessment methodology will be based on the following framework.

1. Consultation Responses: All the preliminary consultation responses received during the scoping stage will be reviewed and relevant information will be incorporated into the assessment.
2. Study Area: An appropriate study area will be identified taking into consideration the footprints of the proposed development, sensitivity of area and potential environmental effects due to the proposed developmental activities.

3. **Baseline Studies:** Identification and review of current status of shipping and navigational traffic within the study area will be undertaken.
4. **Impact Assessment:** Potential environmental impacts will be identified taking into consideration the proposed developmental activities. Once identified, assessment will be carried out to understand the significance of those impacts.
5. **Mitigation Measures:** If any significant impact is identified, then appropriate mitigation measure will be proposed to nullify or reduce the impact.
6. **Monitoring Measures:** Where appropriate, measures for the monitoring of mitigation measures and the proposal should be presented to ensure that mitigation is enacted effectively and that the actual impacts are consistent with the predicted impacts.

# 11 SOCIO-ECONOMICS, POPULATION AND HUMAN-HEALTH

## 11.1 Introduction

The section relates to the socioeconomic, population and human-health aspects of the proposed development and identifies any relevant potential significant effect associated with the proposed development.

## 11.2 Study Area

As the proposed development will have both direct and indirect impacts on the socioeconomic status of the people in the region, the study area for socioeconomic will be Orkney Island.

## 11.3 Baseline Conditions

### 11.3.1 Demographic<sup>48</sup>

On 30 June 2021, the population of Orkney Islands was 22,540 with about 60% population between 16 to 64 years of age. Numbers of females are almost the same as males.

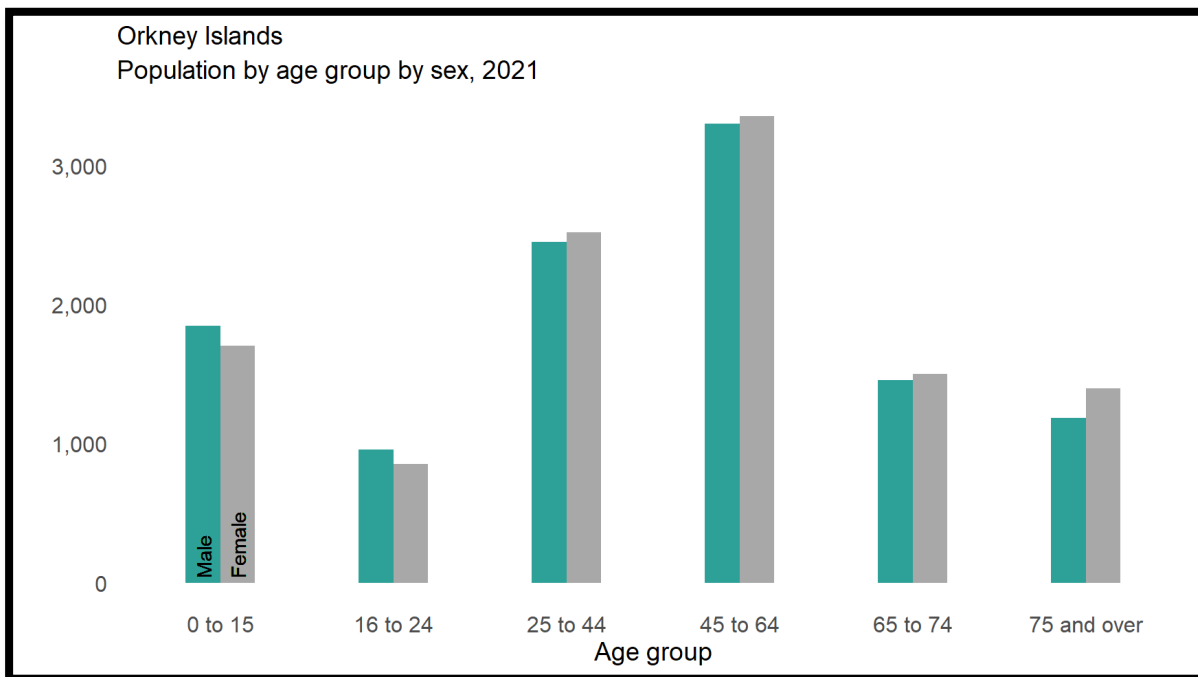


Figure 11-1: Orkney population

<sup>48</sup> Orkney Islands Council Area Profile (nrscotland.gov.uk)

### **11.3.2 Health<sup>49</sup>**

The overall health of the population is good. As of 2019, 88.6% adults have good or very good general health (self-assessed). 23.90% adults have long term limiting physical or mental health condition.

### **11.3.3 Occupation<sup>50</sup>**

Most of the people are employed in the Orkney Islands with about 70% of the adults employed full time as of 2020-Q1 with total number of business units more than 1000 in 2021.

## **11.4 Potentially Significant Effects**

As previously mentioned, Flotta island is very sparsely populated. The nearest residential unit is 1.5 km from the site. The proposed development activities during construction and operation are not envisaged to have any significant effect on the health or population of local residents. However, it will be facilitating direct and indirect employments and will support several local businesses. There might be significant positive impact in terms of socioeconomic from the proposed development.

## **11.5 Inclusion or Exclusion from EIA**

Considering the above information, population and human health is proposed to be scoped out but socioeconomic is proposed to be scoped into the EIAR.

## **11.6 Assessment methodology**

In order to understand the significance of socioeconomic impact of the proposed development, a standard Social Impact Assessment methodology will be followed. It includes the following steps:

1. Identification of study area.
2. Baseline socioeconomic status.
3. Potential employment opportunities due to the proposed development, directly and indirectly.
4. Impact Assessment.
5. Mitigation measures, if needed.

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<sup>49</sup> statistics.gov.scot | Orkney Islands

<sup>50</sup> statistics.gov.scot | Orkney Islands

## 12 CONCLUSIONS

The conclusions of the detailed scoping appraisals identified that the topic areas listed below are considered to merit a full impact assessment and thereby documented within an EIAR.

- Water Environment (coastal processes and peat soil);
- Biodiversity;
- Airborne Noise;
- Archaeology and Cultural Heritage (including potential vibration effects on Scheduled monuments);
- Seascape, Landscape and Visual;
- Carbon Impact Assessment;
- Shipping and Navigation; and
- Socio-Economics.

In addition to the above, a Habitats Regulations Appraisal (HRA) will be undertaken to assess any potential likely significant effects (LSE) on the qualifying species of the Scapa Flow SPA.

On the basis of professional judgement and the findings of the scoping appraisal, full EIA's are not considered necessary for the following topics, however supporting statements and information will be provided for each topic within the introductory chapters of the EIAR:

- Air Quality;
- Population and Human Health;
- Climate Change and Resilience;
- Traffic Assessment;
- Accidents and Natural Disasters; and
- Material Assets and Waste.

The Highland Council Guidance Note<sup>51</sup>, considered a standard throughout Scotland, sets out a robust Environmental Management Process that incorporates the findings of the EIA Report as well as other requirements from consents, licenses, legislation, and best practise. It is proposed that a Construction Environmental Management Document and Plans (CEMD and CEMPs) be developed in accordance with this Guidance Note so as to provide site specific practical mitigation measures to ensure that during the construction phase the environment is protected. The CEMD and associated CEMPs would be a working document which would be updated throughout the construction phase of the project. It would also provide a clear roadmap of the key roles and responsibilities during construction works. An Environmental Manager would be identified who would be responsible for the implementation of the CEMD and associated CEMPs, ensuring that all agreed measures are applied and adhered to.

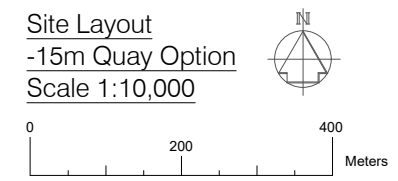
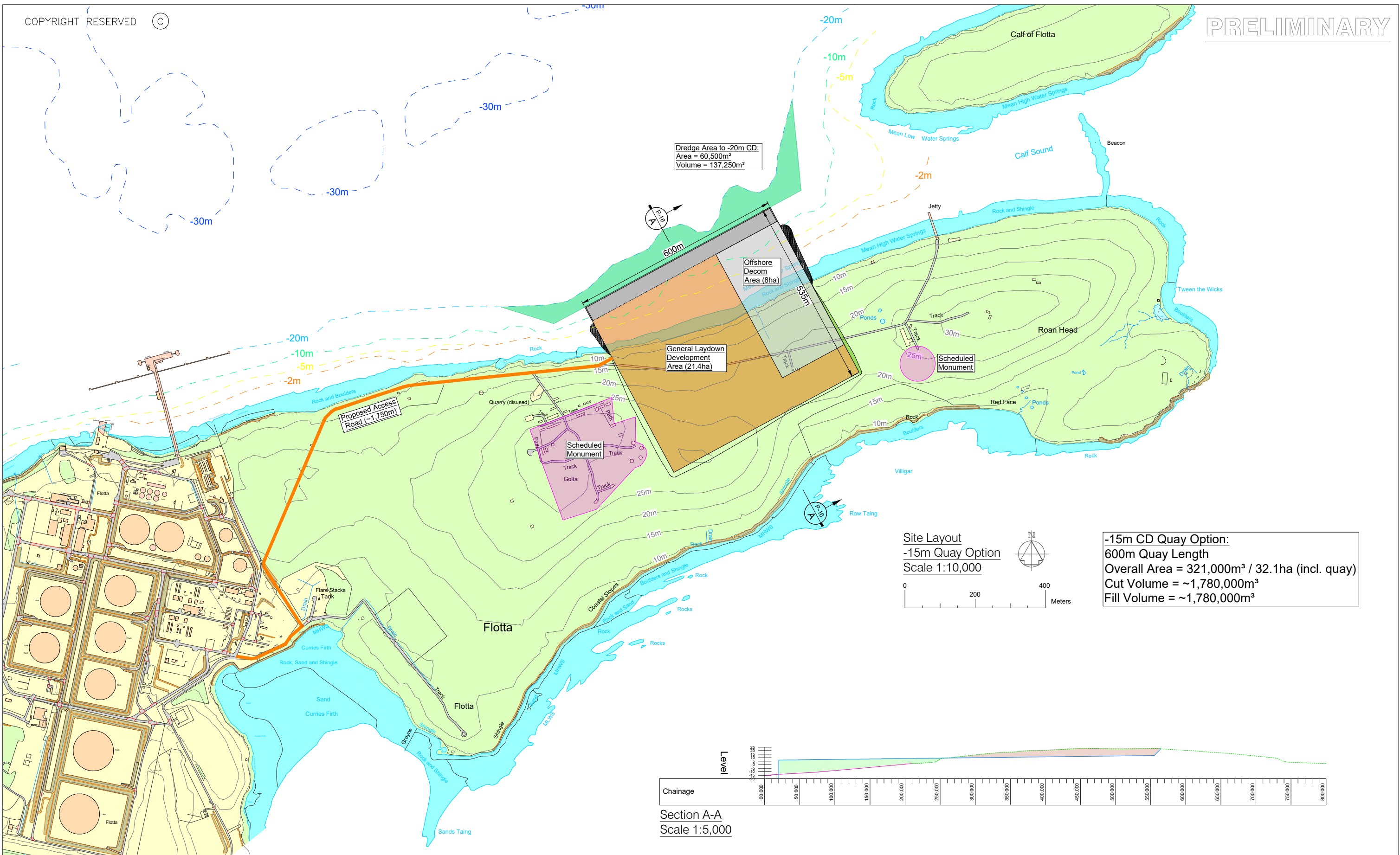
Note: The CEMD and associated CEMPs would be finalised on receipt of Planning / Marine Consent and would aid discharge of planning/marine license conditions. It would also form part of the tender documents during the contracting phase of the development.

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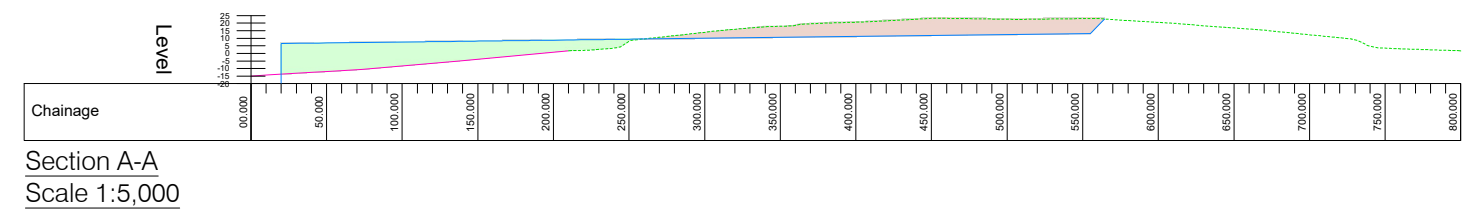
<sup>51</sup> The Highland Council Guidance Note – Construction Environmental Management Process for Large Scale Projects, dated August 2010.

# APPENDICES

# **A PROPOSED DEVELOPMENT BOUNDARY – OPTION 1**



**-15m CD Quay Option:**  
 600m Quay Length  
 Overall Area = 321,000m<sup>3</sup> / 32.1ha (incl. quay)  
 Cut Volume = ~1,780,000m<sup>3</sup>  
 Fill Volume = ~1,780,000m<sup>3</sup>



**Arch Henderson** 1919  
 Civil Engineers  
 Structural Engineers  
 Architects  
 CDM Co-ordinators  
 Geotechnical services  
 Environmental services

Stewart Building, Lerwick, Shetland. ZE1 0LL.  
 Tel : 01595 695512  
 www.arch-henderson.co.uk - email : lerwick@arch-henderson.co.uk

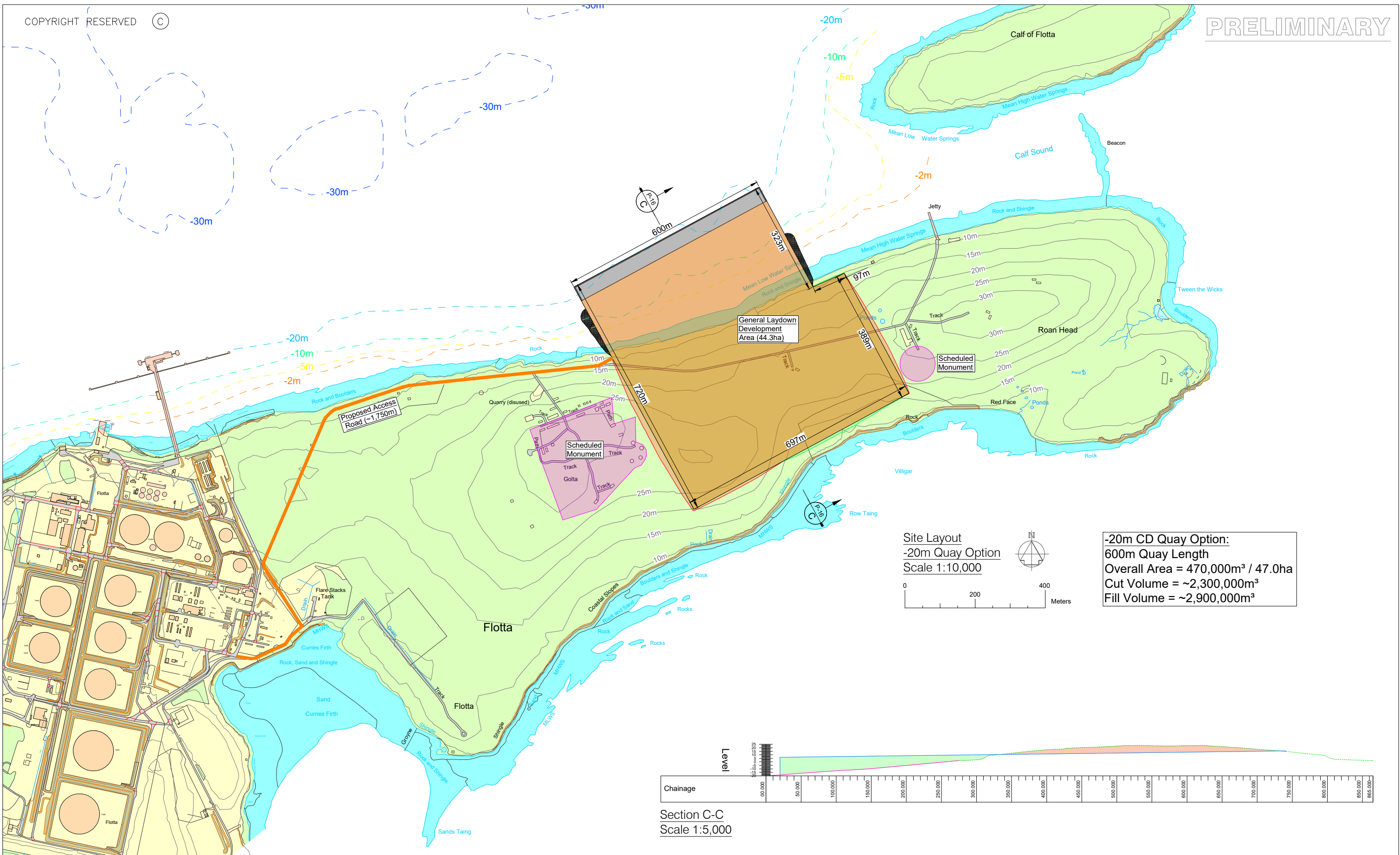
Aberdeen; Dundee; Glasgow; Lerwick; Inverness; Thurso; Stromness; Southampton; Falkland Islands

NOTES :

P1	27.11.2023	Prelim	Preliminary Issue P1	PRN	SCALE: (A3) As Shown	PROJECT : Ernst & Young Flotta Development
REV	DATE	STATUS P/T/C/R	REVISION / ISSUE / PURPOSE	BY CHKD	DATE : Nov 2023	DRAWING TITLE : Option 1 -15m Quay
					DRAWN: PRN	DRAWING No : 222066-P-11
					CHKD : SSJ APPD : SSJ	REV : P1
					DRAWING STATUS : Preliminary	

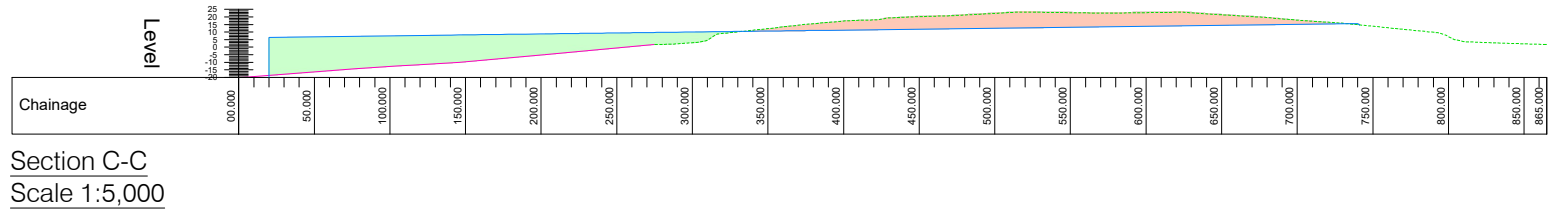


## **B PROPOSED DEVELOPMENT BOUNDARY – OPTION 2**



Site Layout  
-20m Quay Option  
Scale 1:10,000

**-20m CD Quay Option:**  
 600m Quay Length  
 Overall Area = 470,000m<sup>3</sup> / 47.0ha  
 Cut Volume = ~2,300,000m<sup>3</sup>  
 Fill Volume = ~2,900,000m<sup>3</sup>



NOTES :

							SCALE: (A3) As Shown	PROJECT : Ernst & Young Flotta Development
							DATE : Nov 2023	DRAWING TITLE : Option 2 -20m Quay
P1	21.11.2023	Prelim	Preliminary Issue		PRN	CHKD : SSJ	APPD : SSj	DRAWING No : 222066-P-13
REV	DATE	STATUS P/T/C/R	REVISION / ISSUE / PURPOSE		BY	CHKD	DRAWING STATUS : Preliminary	REV : P1

## C CANMORE SITES WITHIN STUDY AREA

CANMOREID	NAME	ALTNAME	BROADCLASS	SITE TYPE
102023	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102187	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102188	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102190	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102191	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102195	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102196	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102197	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102199	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102201	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY	GOLTA, CALF OF FLOTTA, UNKNOWN	MARITIME CRAFT	CRAFT
102202	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY	FLOTTA JETTY NO. 1, Foul	MARITIME CRAFT	OBSTRUCTION
102246	UNKNOWN: PAN HOPE, FLOTTA, SCAPA FLOW, ORKNEY	QUOY NESS, SOUND OF HOXA, PAN HOPE PIER	MARITIME CRAFT	CRAFT
102250	UB-116: SOUND OF HOXA, SCAPA FLOW, ORKNEY	UB116, UB 116, UB-116	MARITIME CRAFT	SUBMARINE (FIRST WORLD WAR)
102251	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102256	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY	FLOTTA JETTY NO. 1, Foul	MARITIME CRAFT	OBSTRUCTION
102263	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102266	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA NO. 1 JETTY, Foul	MARITIME CRAFT	OBSTRUCTION (PERIOD UNKNOWN)
102267	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102273	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA	MARITIME CRAFT	CRAFT
102276	UNKNOWN: SCAPA FLOW, ORKNEY	CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION
102303	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA, CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102309	UNKNOWN: SCAPA FLOW, ORKNEY	CALF SOUND, Foul	MARITIME CRAFT	OBSTRUCTION(S) (PERIOD UNKNOWN)
102985	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA, GOLTA, CALF OF FLOTTA, Foul	MARITIME CRAFT	OBSTRUCTION(S)
102996	SMS S54 [SECONDARY LOCATION]: QUOY NESS, FLOTTA, SCAPA FLOW, ORKNEY	S-54, S54, S 54	MARITIME CRAFT	DESTROYER (20TH CENTURY), MOTOR TORPEDO BOAT
103004	HMS VANGUARD: SCAPA FLOW, ORKNEY	FLOTTA, FARA, WEDDEL SOUND, HMS VANGUARD	MARITIME CRAFT	BATTLESHIP (20TH CENTURY)
224582	FRIENDS: FLOTTA, SCAPA FLOW, ORKNEY	'ISLAND OF HOSSA', FRIENDS	MARITIME CRAFT	CRAFT (19TH CENTURY)

## Flotta Ultra Deep Water Quay; Environmental Impact Assessment (EIA) Scoping Report

CANMOREID	NAME	ALTNAME	BROADCLASS	SITE TYPE
225582	DELIGHT: FLOTTA, SCAPA FLOW, ORKNEY	DELIGHT	MARITIME CRAFT	BRIG (19TH CENTURY)
227344	BARBARA: FLOTTA, SCAPA FLOW, ORKNEY		MARITIME CRAFT	SCHOONER (20TH CENTURY)
227943	HENRIETTA: FLOTTA, SCAPA FLOW, ORKNEY	'NORTH SIDE OF FLOTTA', 'OFF CAVA ISLAND', 'ON THE SOUTH SIDE OF THE ISLAND OF CAVA', HENRIETTA	MARITIME CRAFT	BRIG (19TH CENTURY)
229405	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY	'ON FLOTTA ISLE'	MARITIME CRAFT	LUGGER (20TH CENTURY)
230186	LEGEND: FLOTTA, SCAPA FLOW, ORKNEY	PEARL, 'IN THE SCAPA FLOW AREA', LEGEND (EX. PEARL)	MARITIME CRAFT	REQUISITIONED MOTOR FISHING VESSEL (20TH CENTURY)
230810	UNKNOWN: SCAPA FLOW, ORKNEY	NO. 1 JETTY, FLOTTA	MARITIME CRAFT	BARGE
259027	ELM GROVE: FLOTTA, SCAPA FLOW, ORKNEY	ELMGROVE, 'IN THE LONGHOPE', ELM GROVE	MARITIME CRAFT	SCHOONER (19TH CENTURY)
283144	ELLIDA: FLOTTA, SCAPA FLOW, ORKNEY		MARITIME CRAFT	BRIG (19TH CENTURY)
284168	HARMONIE: FLOTTA, SCAPA FLOW, ORKNEY	STROMNESS, LONG HOPE, LONGHOPE ROADS, PENTLAND FIRTH, NORTH SEA, HARMONIE	MARITIME CRAFT	BRIG (19TH CENTURY)
284172	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY	PENTLAND FIRTH, NORTH SEA	MARITIME CRAFT	BRIG (19TH CENTURY)
284173	MISCHIEF: FLOTTA, SCAPA FLOW, ORKNEY	PENTLAND FIRTH, NORTH SEA	MARITIME CRAFT	SCHOONER (19TH CENTURY)
284248	ANITA: FLOTTA, SCAPA FLOW, ORKNEY	PENTLAND FIRTH, NORTH SEA	MARITIME CRAFT	CRAFT (19TH CENTURY)
284338	ISABELLA: FLOTTA, SCAPA FLOW, ORKNEY	PENTLAND FIRTH, NORTH SEA, ISABELLA	MARITIME CRAFT	SMACK (19TH CENTURY)
287783	UNKNOWN: SCAPA FLOW, ORKNEY	FARA, FLOTTA	MARITIME CRAFT	OBSTRUCTION
287784	UNKNOWN: SCAPA FLOW, ORKNEY	FARA, FLOTTA	MARITIME CRAFT	OBSTRUCTION
287785	UNKNOWN: SCAPA FLOW, ORKNEY	FARA, FLOTTA	MARITIME CRAFT	OBSTRUCTION(S)
287793	BROTHERS: FLOTTA, SCAPA FLOW, ORKNEY	SKERRY OF NESS, ISLAND OF FLOTTA, PENTLAND FIRTH, NORTH SEA, BROTHERS	MARITIME CRAFT	SLOOP (19TH CENTURY)
287794	ANNETTE: ROAN HEAD, FLOTTA, SCAPA FLOW, ORKNEY	ANNETTE	MARITIME CRAFT	SHIP (19TH CENTURY)
287804	UNKNOWN: FLOTTA, SCAPA FLOW, ORKNEY		MARITIME CRAFT	OBSTRUCTION
287813	UNKNOWN: SCAPA FLOW, ORKNEY	FLOTTA	MARITIME CRAFT	OBSTRUCTION
287845	SYKES: PAN HOPE, FLOTTA, SCAPA FLOW, ORKNEY	SOUND OF HOXA, SYKES	MARITIME CRAFT	SLOOP (18TH CENTURY)
287960	DOUGLAS: FLOTTA, SCAPA FLOW, ORKNEY	PENTLAND FIRTH, NORTH SEA, DOUGLAS	MARITIME CRAFT	CRAFT (18TH CENTURY)

CANMOREID	NAME	ALTNAME	BROADCLASS	SITE TYPE
303044	UNKNOWN: AVIL, PAN HOPE, FLOTTA, SCAPA FLOW, ORKNEY	SOUND OF HOXA	MARITIME CRAFT	CRAFT
321499	UNKNOWN		MARITIME CRAFT	OBSTRUCTION (POSSIBLE)
321503	UNKNOWN		MARITIME CRAFT	BARGE(S)
321514	UNKNOWN		MARITIME CRAFT	OBSTRUCTION (POSSIBLE)
324722	UNKNOWN		MARITIME CRAFT	CRAFT
324728	UNKNOWN		MARITIME CRAFT	OBSTRUCTION
324729	UNKNOWN		MARITIME CRAFT	CRAFT (POSSIBLE)
324730	UNKNOWN		MARITIME CRAFT	CRAFT (POSSIBLE)
325206	UNKNOWN		MARITIME CRAFT	OBSTRUCTION
325207	UNKNOWN		MARITIME CRAFT	CRAFT (POSSIBLE)
325209	UNKNOWN		MARITIME CRAFT	OBSTRUCTION
325210	UNKNOWN		MARITIME CRAFT	OBSTRUCTION
327459	ELIZABETH		MARITIME CRAFT	SCHOONER
331091	Scapa Flow, Orkney		UNASSIGNED (OBJECT)	UNIDENTIFIED OBJECT
369305	HMS VALIANT, RN STEAM PINNACE 288		MARITIME CRAFT	PINNACE (FIRST WORLD WAR)
81808	FLOTTA, ROAN HEAD BATTERY	GOLTA PENINSULA	DEFENCE	COASTAL BATTERY (FIRST WORLD WAR)
104475	FLOTTA, GOLTA, ROAN HEAD, Z BATTERY	GOLTA PENINSULA	DEFENCE	ANTI AIRCRAFT BATTERY (20TH CENTURY)
104479	FLOTTA, ROAN HEAD, LIGHT ANTI-AIRCRAFT BATTERY	LF 3, GOLTA PENINSULA	DEFENCE	GUN EMPLACEMENT (20TH CENTURY)
104480	FLOTTA, ROAN HEAD	GOLTA PENINSULA	DEFENCE	BARRAGE BALLOON SITE (SECOND WORLD WAR)
104482	FLOTTA, ROAN HEAD, YMCA	GOLTA PENINSULA	UNASSIGNED, MONUMENT (BY FORM)	BUILDING (FIRST WORLD WAR)
104483	FLOTTA, ROAN HEAD, LIGHT ANTI-AIRCRAFT BATTERY	GOLTA PENINSULA	DEFENCE	GUN EMPLACEMENT (20TH CENTURY)
104484	FLOTTA, ROAN HEAD, LIGHT ANTI-AIRCRAFT BATTERY	LF 1, LF 2, GOLTA PENINSULA	UNASSIGNED, MONUMENT (BY FORM), DEFENCE	BUILDING(S) (20TH CENTURY), GUN EMPLACEMENT(S) (20TH CENTURY)
104487	FLOTTA, GARSON	F2, BLACKAWALL	DEFENCE	ANTI AIRCRAFT BATTERY (20TH CENTURY)
104489	FLOTTA, QUOYNESS		UNASSIGNED, MONUMENT (BY FORM)	BUILDING(S) (20TH CENTURY)
104491	FLOTTA, QUOYNESS		AGRICULTURE AND SUBSISTENCE, INDUSTRIAL	FARMSTEAD (PERIOD UNASSIGNED), HORSE ENGINE HOUSE (19TH CENTURY) - (20TH CENTURY)
105636	FLOTTA, SUTHERLAND	F1	DEFENCE	ANTI AIRCRAFT BATTERY (20TH CENTURY)
133641	FLOTTA TERMINAL	SCAPA FLOW, OCCIDENTAL PETROLEUM	INDUSTRIAL	OIL PIPELINE TERMINAL (MODERN)
138694	FLOTTA, CURRIES FIRTH		TRANSPORT	NAUST(S) (PERIOD UNASSIGNED)
138695	FLOTTA, BURN OF BUSTA	LURDY'S TAING	UNASSIGNED, MARITIME, TRANSPORT	JETTY (PERIOD UNASSIGNED), STRUCTURE (PERIOD UNASSIGNED)
138698	FLOTTA, NEWPAN	QUOYNESS-PAN	UNASSIGNED, MONUMENT (BY FORM), AGRICULTURE AND SUBSISTENCE, MARITIME,	BUILDING(S) (PERIOD UNASSIGNED), JETTY (PERIOD UNASSIGNED), PIER (PERIOD UNASSIGNED),

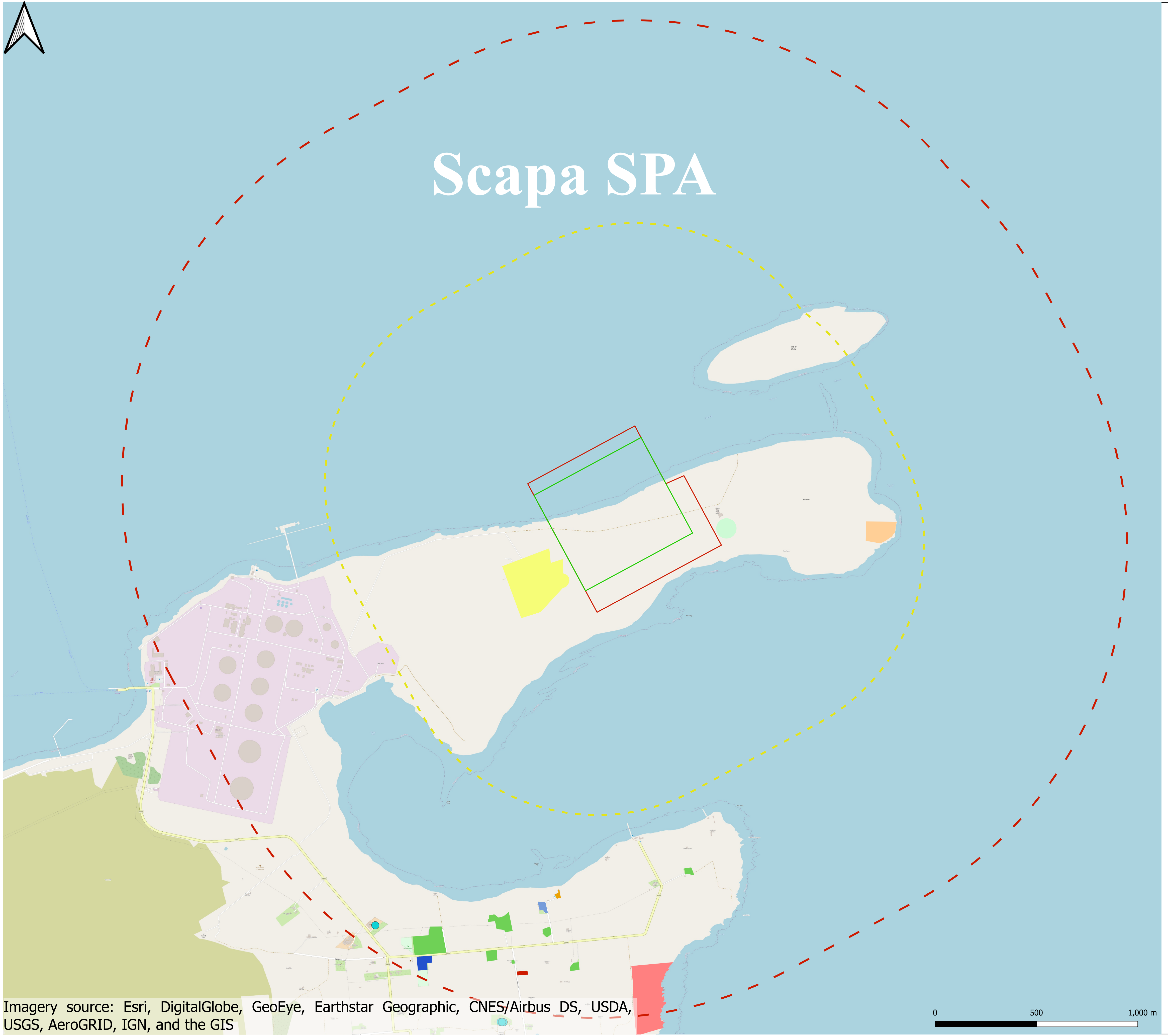
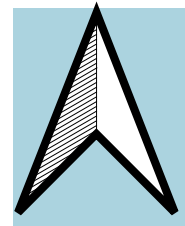
CANMOREID	NAME	ALTNAME	BROADCLASS	SITE TYPE
			TRANSPORT, DOMESTIC	TOWNSHIP (PERIOD UNASSIGNED)
138699	FLOTTA, LEE CRAIG, LIGHT ANTI-AIRCRAFT BATTERY	LF 4	UNASSIGNED, DEFENCE	BARRAGE BALLOON SITE (SECOND WORLD WAR) (POSSIBLE), GUN EMPLACEMENT (20TH CENTURY)(POSSIBLE), STRUCTURE(S) (20TH CENTURY)
173777	FLOTTA, ROAN HEAD	GOLTA PENINSULA	UNASSIGNED, MONUMENT (BY FORM)	BUILDING (20TH CENTURY), STRUCTURE(S) (20TH CENTURY)
173779	FLOTTA, ROAN HEAD	TWEEN THE WICKS, GOLTA PENINSULA	UNASSIGNED, MONUMENT (BY FORM)	BUILDING(S) (20TH CENTURY), ENCLOSURE (20TH CENTURY)
173787	FLOTTA, ROAN HEAD	CALF SOUND, GOLTA PENINSULA, ST VINCENT PIER	UNASSIGNED, MONUMENT (BY FORM), MARITIME, DOMESTIC, TRANSPORT	BUILDING (FIRST WORLD WAR), BUILDING (SECOND WORLD WAR), HUT(S) (SECOND WORLD WAR), HUT(S) (FIRST WORLD WAR), JETTY (SECOND WORLD WAR), JETTY (FIRST WORLD WAR)
173788	FLOTTA, ROAN HEAD	CALF SOUND, GOLTA PENINSULA	DEFENCE	BARRAGE BALLOON SITE (SECOND WORLD WAR)
173806	FLOTTA, GOLTA		DEFENCE	BARRAGE BALLOON SITE (SECOND WORLD WAR)
175051	FLOTTA, ROAN HEAD	GOLTA PENINSULA	MONUMENT (BY FORM), DOMESTIC	BANK (EARTHWORK) (PERIOD UNASSIGNED), HUT (PERIOD UNASSIGNED)
175059	FLOTTA, WINSTERS	ROAN HEAD	AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED)
182508	FLOTTA, BRAEHEAD		AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED)
182510	FLOTTA, FLOTTA SCHOOL		AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED) (POSSIBLE)
182511	FLOTTA, FLOTTA TERMINAL	FLOTTA, GRAVES	UNASSIGNED, MONUMENT (BY FORM)	BUILDING (PERIOD UNASSIGNED)
182512	FLOTTA, FLOTTA TERMINAL	FLOTTA, LITTLE BLOWMAIR	UNASSIGNED, MONUMENT (BY FORM)	BUILDING (PERIOD UNASSIGNED)
182515	FLOTTA, AVIL		UNASSIGNED, MONUMENT (BY FORM)	BUILDING (PERIOD UNASSIGNED)
182516	FLOTTA, NEWPAN		UNASSIGNED	STRUCTURE (PERIOD UNASSIGNED)
182517	FLOTTA, SERRAQUOY		UNASSIGNED	STRUCTURE (PERIOD UNASSIGNED)
182519	FLOTTA, ROAN HEAD	WINSTERS, GOLTA PENINSULA	MONUMENT (BY FORM)	ENCLOSURE (PERIOD UNASSIGNED)
214695	FLOTTA, ROAN HEAD, MINEFIELD CONTROL STATION	RED FACE, GOLTA PENINSULA	UNASSIGNED, MONUMENT (BY FORM), DEFENCE	BUILDING(S) (FIRST WORLD WAR), STRUCTURE(S) (FIRST WORLD WAR), TRENCH(S) (FIRST WORLD WAR)
229286	HOY, FLOTTA, WHOME KILN AND BARN		AGRICULTURE AND SUBSISTENCE, INDUSTRIAL	BARN (PERIOD UNASSIGNED), KILN (PERIOD UNASSIGNED)
249683	FLOTTA, ROAN HEAD, ANTI-SUBMARINE BOOM	GOLTA PENINSULA, CALF SOUND, SCAPA FLOW	COMMUNICATIONS, DEFENCE, MARITIME	BEACON (20TH CENTURY), BOOM DEFENCE (20TH CENTURY)
270013	FLOTTA, GOLTA, 'Z' BATTERY	GOLTA PENINSULA, ROAN HEAD	DEFENCE, DOMESTIC	ABLUTIONS BLOCK (20TH CENTURY), MILITARY CAMP (20TH CENTURY)

CANMOREID	NAME	ALTNAME	BROADCLASS	SITE TYPE
270014	FLOTTA, GOLTA, DECOY ANTI-AIRCRAFT BATTERY	GOLTA PENINSULA, ROAN HEAD	DEFENCE	DECOY SITE (20TH CENTURY)
270042	FLOTTA, ROAN HEAD, RED FACE	GOLTA	DEFENCE	BOMB CRATER(S) (20TH CENTURY)
270096	FLOTTA, BUCHANAN BATTERY, NOS.1 AND 2 ENGINE HOUSES		INDUSTRIAL	ENGINE HOUSE (20TH CENTURY)
270108	FLOTTA, BUCHANAN BATTERY		DEFENCE	SEARCHLIGHT BATTERY (20TH CENTURY)
270109	FLOTTA, BUCHANAN BATTERY		DEFENCE	MILITARY CAMP (20TH CENTURY)
303017	FLOTTA, WHANCLETT		AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED)
303019	FLOTTA, GRAVES		AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED)
303020	FLOTTA, GRAVES	CURRIES FIRTH	UNASSIGNED, MONUMENT (BY FORM)	BUILDING (PERIOD UNASSIGNED), ENCLOSURE (PERIOD UNASSIGNED)
303022	FLOTTA, LITTLE BLOWMAIR		AGRICULTURE AND SUBSISTENCE	FARMSTEAD (PERIOD UNASSIGNED)
303024	FLOTTA, CURRIES		AGRICULTURE AND SUBSISTENCE, MONUMENT (BY FORM), WATER SUPPLY AND DRAINAGE	ENCLOSURE (PERIOD UNASSIGNED), FARMSTEAD (PERIOD UNASSIGNED), WELL (PERIOD UNASSIGNED)
303026	FLOTTA, GARSON		AGRICULTURE AND SUBSISTENCE, MONUMENT (BY FORM), WATER SUPPLY AND DRAINAGE	ENCLOSURE (PERIOD UNASSIGNED), FARMSTEAD (PERIOD UNASSIGNED), WELL (PERIOD UNASSIGNED)
303027	FLOTTA, LITTLE BLOWMAIR	FLOTTA, CURRIES	UNASSIGNED, MONUMENT (BY FORM), WATER SUPPLY AND DRAINAGE	BUILDING (PERIOD UNASSIGNED), WELL (PERIOD UNASSIGNED)
303034	FLOTTA, CROWNEST		AGRICULTURE AND SUBSISTENCE, WATER SUPPLY AND DRAINAGE	FARMSTEAD (PERIOD UNASSIGNED), WELL (PERIOD UNASSIGNED)
303041	FLOTTA, LURDY		GARDENS PARKS AND URBAN SPACES, MARITIME, TRANSPORT	BOATHOUSE (PERIOD UNASSIGNED), JETTY (PERIOD UNASSIGNED)
303063	FLOTTA, AVIL		GARDENS PARKS AND URBAN SPACES, MARITIME, TRANSPORT	BOATHOUSE (PERIOD UNASSIGNED), NAUST (PERIOD UNASSIGNED)
303064	FLOTTA, WHOME		TRANSPORT	NAUST (PERIOD UNASSIGNED)
303074	FLOTTA, CURRIES FIRTH		GARDENS PARKS AND URBAN SPACES, MARITIME, TRANSPORT	BOATHOUSE (PERIOD UNASSIGNED), CLEARED SLIPWAY (PERIOD UNASSIGNED)
306650	FLOTTA, ROAN HEAD		MONUMENT (BY FORM)	MOUND (PERIOD UNASSIGNED)
306651	FLOTTA, CALF SOUND		MONUMENT (BY FORM)	DYKE (PERIOD UNASSIGNED)
307192	PAN		MARITIME	PIER (PERIOD UNASSIGNED)
312099	PAN HOPE		UNASSIGNED	ARCHAEOLOGICAL FEATURE (PERIOD UNASSIGNED) (POSSIBLE)
314082	FLOTTA, SANDS TAING		UNASSIGNED	MARKER POST (20TH CENTURY), MARKER STONE (20TH CENTURY)

<b>CANMOREID</b>	<b>NAME</b>	<b>ALTNAME</b>	<b>BROADCLASS</b>	<b>SITE TYPE</b>
314086	FLOTTA, ROW TAING		MONUMENT (BY FORM)	DYKE (19TH CENTURY) - (20TH CENTURY)
314092	FLOTTA, VILLIGAR	WINSTERS WELL	MONUMENT (BY FORM), WATER SUPPLY AND DRAINAGE	ENCLOSURE (PERIOD UNASSIGNED), WELL (PERIOD UNASSIGNED) (POSSIBLE)
314093	FLOTTA, WINSTERS	VILLIGAR	AGRICULTURE AND SUBSISTENCE	SHEEPFOLD (PERIOD UNASSIGNED)
314094	FLOTTA, RED FACE		MONUMENT (BY FORM)	EARTHWORK (20TH CENTURY)
314096	FLOTTA, CALF SOUND		COMMUNICATIONS, DEFENCE	COMMUNICATIONS STATION (20TH CENTURY), MILITARY SIGNALLING SITE (20TH CENTURY)
315284	FLOTTA, ROAN HEAD		DEFENCE	BOMB CRATER(S) (20TH CENTURY) (POSSIBLE)
345141	FLOTTA, ROAN HEAD, GOLF COURSE		RECREATIONAL	GOLF COURSE (FIRST WORLD WAR)
345768	FLOTTA, PEERIE LURDY	HYDROPHONE STATION, PEERIE MUSEUM, SILENT CABIN, QUOYNESS MINING STATION	EDUCATION, UNASSIGNED, RECREATIONAL, MONUMENT (BY FORM), DOMESTIC	BUILDING (PERIOD UNASSIGNED), HUT (FIRST WORLD WAR), MUSEUM (21ST CENTURY)












# **D ENVIRONMENTAL SENSITIVITY MAP**








Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographic, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS

**Legend**

-  Project Boundary\_Option 1
-  Project Boundary\_Option 2
-  1 km buffer
-  2 km Buffer
-  Commercial
-  Habitation
-  Medical Clinic
-  Museum
-  Primary School

**Scheduled monuments**

-  Buchanan Battery, Stanger Head
-  Roan Head, coastal battery and camp (WW1)
-  Roan Head, World War II Balloon Barrage site
-  World War II Z Battery and Light AA Battery
-  Listed Building (Category C)

Do not scale this map

**Client**  
Arch Henderson LLP

**Project**  
Flotta Deep Water Quay

**Title**  
Enironmental Sensitivity Map

**Status** Final

<b>Drawing No.</b> 678762A-QGIS003	<b>Revision</b> --	<b>Date</b> 05 11 2023
<b>Drawn</b> JSH	<b>Checked</b> --	<b>Approved</b> --

**Scale** 1:9,342 @ A1

Rev	Date	Amendment	Initials
-	-	-	-



Craighall Business Park, Eagle Street, Glasgow, G4 9XA  
T: 0141 341 5040 E: info@envirocentre.co.uk W: www.envirocentre.co.uk

# **E      ECOLOGICAL MAP**

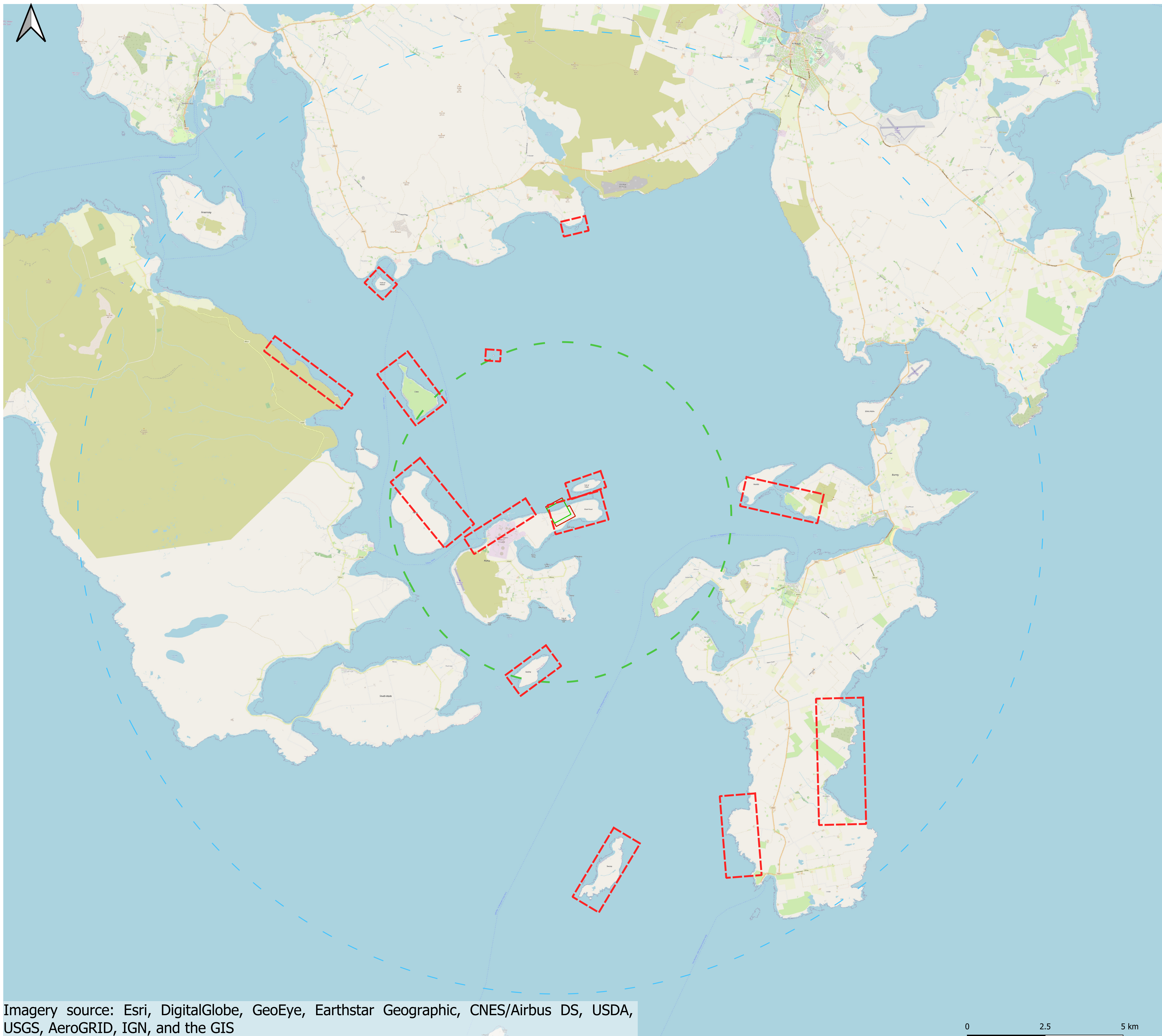









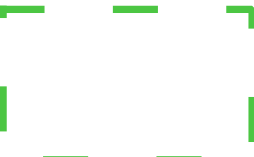

# **F SEAL HAUL-OUT SITES MAP**





Imagery source: Esri, DigitalGlobe, GeoEye, Earthstar Geographic, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS

**Legend**

-  Project Boundary\_Option 1
-  Project Boundary\_Option 2
-  15 km Buffer
-  5 km Buffer
-  Seal haul sites

Do not scale this map

**Client**  
Arch Henderson LLP

**Project**  
Flotta Deep Water Quay

**Title**  
Seal Haul Sites Map

**Status**  
Final

<b>Drawing No.</b> 678762A-QGIS006	<b>Revision</b> --	<b>Date</b> 05 11 2023
<b>Drawn</b> JSH	<b>Checked</b> --	<b>Approved</b> --

**Scale**  
1:60,871 @ A1

Rev	Date	Amendment	Initials
-	-	-	-

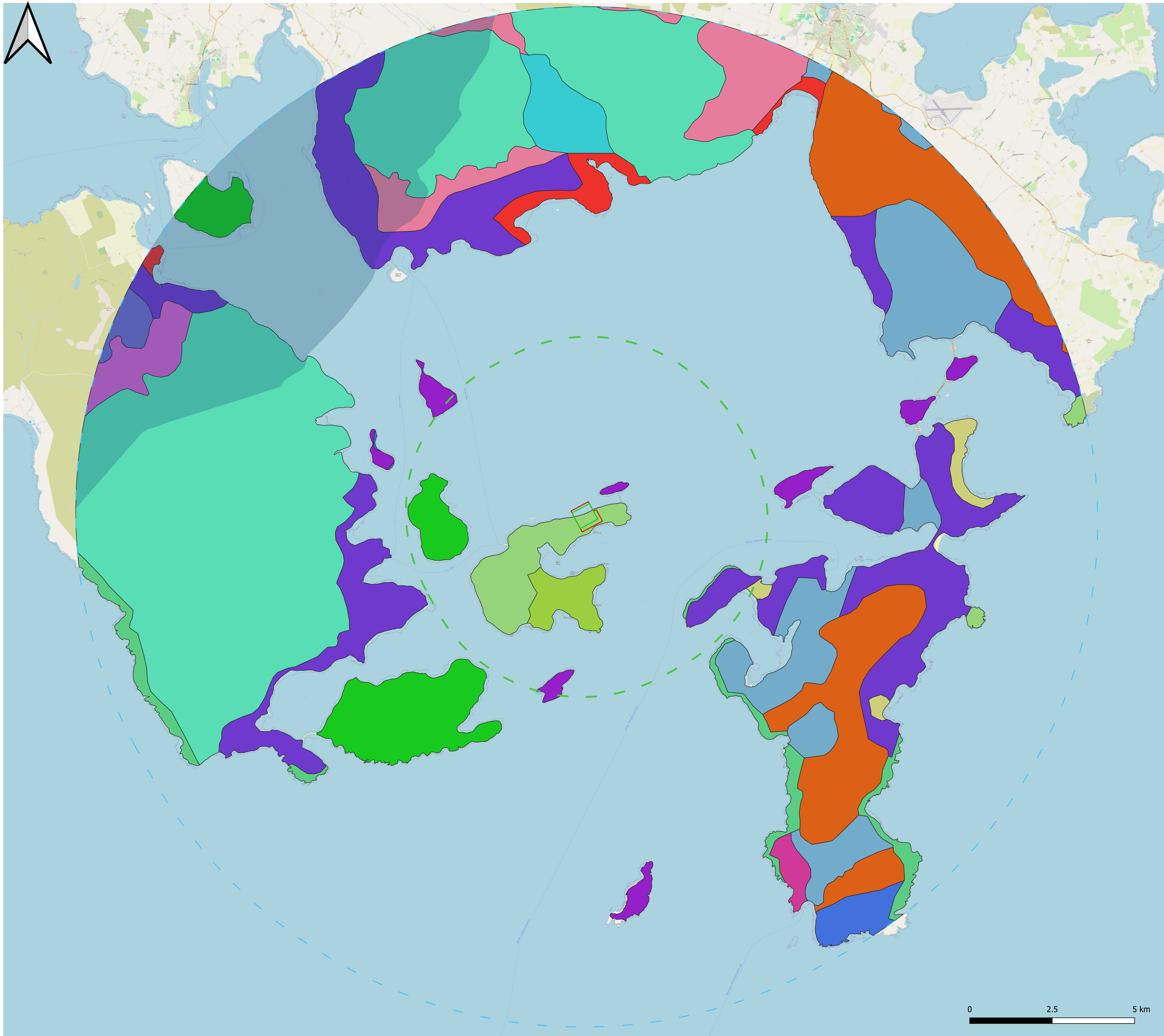


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**G SLVIA MAP**





**Legend**

- Project Boundary\_Option 1
- Project Boundary\_Option 2
- 5 km Buffer
- 15 km Buffer
- National Scenic Area
- Cliffs - Orkney
- Coast with Sand - Orkney
- Coastal Basin
- Coastal Hills and Heath
- Enclosed Bays
- Holms
- Inclined Coastal Pasture
- Loch Basin - Orkney
- Low Island Pastures
- Low Moorland
- Moorland Hills - Orkney
- Plateau Heath and Pasture
- Rolling Hill Fringe
- Rugged Hills
- U-Shaped Valley
- Undulating Island Pasture
- Whaleback Islands

Do not scale this map

**Client**  
Arch Henderson LLP

**Project**  
Flotta Deep Water Quay

**Title**  
Seascape Landscape and Visual

**Status**  
Final

<b>Drawing No.</b> 678762A-QGIS005	<b>Revision</b> --	<b>Date</b> 16 01 2024
<b>Drawn</b> JSH	<b>Checked</b> --	<b>Approved</b> --

**Scale**  
1:57,592 @ A1

Rev	Date	Amendment	Initials
-	-	-	-

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