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NESHION ENERGY PARK ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

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NESHION ENERGY PARK
ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

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CONTENTS

GLOSSARY AND ABBREVIATIONS

Abbreviation/ Terminology	Expanded Term
the Applicant	Client/developer (Neshion Ltd)
the Proposed Development	The Neshion Energy Park, including the wind turbines, BESS, grid connections and associated site infrastructure
the Site	The area within the Red Line Boundary
the EIA regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended
scoped in	included in the proposed scope of the EIA
scoped out	excluded in the proposed scope of the EIA
AESLQ	Assessment of Effects on Special Landscape Qualities
AIL	Abnormal Indivisible Load
AIP	Aeronautical Information Publication
AM	Amplitude Modulation
AOD	Above Ordnance Datum
ALA	Abnormal Loads Assessment
ATC	Automatic Traffic Count
BEIS	Department of Business, Energy & Industrial Strategy
BERR	Business, Enterprise and Regulatory Reform
BESS	Battery Energy Storage System
BEMP	Biodiversity Enhancement and Management Plan
BGS	British Geological Survey
BS	British Standard
CAA	Civil Aviation Authority
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CO_2	Carbon Dioxide
COMAH	Control of Major Accidents Hazards
CRA	Collision Risk Assessment
dB	decibel
DESNZ	Department for Energy Security and Net Zero
DTI	Department of Trade and Industry
DMRB	Design Manual for Roads and Bridges

DWPA	Drinking Water Protected Area
EcIA	Ecological Impact Assessment
EHO	Environmental Health Officer
EHP	Environmental Health Perspectives
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EU	European Union
FIR	Flight Information Region
GDL	Gardens and Designed Landscapes
GIS	Geographical Information Systems
GLVIA	Guidance for Landscape and Visual Impact assessment
GPG	Good Practice Guide
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependant Terrestrial Ecosystems
Ha	Hectare
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HLA	Historic Land-Use Assessment
HRA	Habitat Regulations Appraisal
HSE	Health and Safety Executive
IEMA	Institute of Environmental Management and Assessment
IFP	Instrument Flight Procedures
IOA	Institute of Acoustics
JRC	Join Radio Company
L_{A90}	The A-weighted noise level exceeded for 90% of the time, often used to describe background or wind turbine noise as it excludes transient noises that affect the LAeq.
LCT	Landscape Character Type
LFA	Low Flying Area
LLA	Local Landscape Area
LNCS	Local Nature Conservation Site
LUP	Land Use Planning
MoD	Ministry of Defence
MW	Megawatts
NBN	National Biodiversity Network
NCAP	National Collection of Aerial Photography
NEP	Neshion Energy Park

NHMRC	National Health and Medical Research Council of Australia
NHS	National Health Service
NLS	National Library Scotland
NML	Noise Monitoring Location
NO_2	Nitrogen Dioxide
NPF4	National Planning Policy Framework 4
NRHE	National Record for the Historic Environment
NSA	National Scenic Area
NSR	Noise Sensitive Receptors
NVC	National Vegetation Classification
OBEHMP	Outline Biodiversity Enhancement and Habitat Management Plan
OS	Ordnance Survey
PAN	Planning Advice Note
PCA	Peatland Condition Assessment
PM_{10}	Particle Matter $_{10}$
PPG	Pollution Prevention Guidelines
PSR	Primary Surveillance Radars
PWS	Private Water Supply
RRH	Remote Radar Head
SAC	Special Area of Conservation
SAT	Shetland Amenity Trust
SBL	Scottish Biodiversity List
SBRC	Shetland Biological Records Centre
SCU	Seascape Character Unites
SEPA	Scottish Environment Protection Agency
SIC	Shetland Islands Council
SLVIA	Seascape, Landscape and Visual Impact Assessment
SMR	Sites and Monuments Record
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protection Area
SSR	Secondary Surveillance Radar
SSSI	Site of Special Scientific Interest
TA	Technical Appendix
TAN	Technical Advise Notice
UIR	Upper Information Region
UHF	Ultra High Frequency

UK	United Kingdom
WLA	Wild Land Area
WTAMR	Wind Turbine Amplitude Modulation Review
WTG	Wind Turbine Generator
WTS	Wind Turbine Syndrome
VP	Vantage Point
ZTV	Zone of Theoretical Visibility

1. INTRODUCTION

1.1 Overview

1.1.1 This Scoping Report is provided in support of a request to the Scottish Ministers for a Scoping Opinion under the terms of Regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended ('the EIA regulations').

1.1.2 Scoping is a statutory procedure by which an Applicant may ask a competent authority for its formal opinion on the information to be supplied within an EIA Report (EIAR). This provision allows the Applicant to be clear about what the authority considers the main effects of the proposal are likely to be, and therefore the topics on which the EIAR should focus.

1.2 The Applicant

1.2.1 Neshion Ltd is a joint venture set up between local families to develop a renewable energy project known as Neshion Energy Park (NEP). The site is approximately 630 hectares (Ha) and is located East of Sullom Voe Oil Terminal (SVT) and Shetland Gas Plant (SGP) in the North Mainland of Shetland, Scotland.

1.2.2 The development of NEP is being led by the Shetland Aerogenerators Development Team. Shetland Aerogenerators is an experienced local renewable energy developer and is the owner and operator of the Burradale and Luggie's Knowe Windfarms.

1.3 Background

1.3.1 The Applicant is developing proposals to construct and operate an Energy Park including up to 10 wind turbine generators (WTGs) with a maximum tip height of 200 m, a Battery Energy Storage System (BESS) and ancillary works. The development is referred to as Neshion Energy Park (NEP) ('the Proposed Development') and is located on land ('the Site') located east of Sullom Voe Oil Terminal and the Shetland Gas Plant in Shetland, Scotland. The Site is entirely within the administrative boundary of Shetland Islands Council (SIC) and the Site location is presented on **Figure 1.1 (Appendix A)**. The scoping layout for the Proposed Development is presented on **Figure 1.2 (Appendix A)**.

1.3.2 This report has been prepared by competent EIA experts at Ramboll UK Limited, with a select team of technical specialists providing inputs covering all the relevant environmental disciplines as set out in **Table 1.1**.

Table 1.1: EIA Team

Discipline	Organisation
Lead EIA Consultant	Ramboll
Planning and Policy	David Bell Planning
Seascape, Landscape and Visual Amenity	Ramboll
Cultural Heritage	AOC Archaeology
Ecology and Ornithology	Alba Ecology
Hydrology, Hydrogeology, Geology and Soils	Ramboll
Traffic and Transport	SYSTRA
Noise	TNEI

Discipline	Organisation
Aviation	Aviatica
Socio-Economics	Ramboll
Telecommunications	Aviatica
Shadow Flicker	Ramboll
Carbon Balance	Ramboll

1.4 Consenting Regime and Relevant Policy Considerations

1.4.1 It is anticipated that the Proposed Development would have an installed capacity of >50 MW. Therefore, an application for consent would be made to the Scottish Ministers under section 36 of the Electricity Act 1989. The Applicant would also seek deemed planning permission under section 57 of the Town and Country Planning (Scotland) Act 1997. The local Planning authority, SIC, will act as a statutory consultee in this process.

1.4.2 The Proposed Development is of a type listed in Schedule 2 of the EIA regulations (item (1) "a generating station"); on the basis that "*the development is likely to have significant effects on the environment by virtue of factors such as its nature, size or location*" an EIA is required. In this case, the Applicant has volunteered to undertake an EIA rather than request a formal screening opinion.

1.4.3 The EIAR will outline relevant policies considered during assessments, while a separate Planning Statement will provide a detailed appraisal of the development against relevant policies.

1.4.4 The Scottish Ministers will determine the application having regard to the statutory duties in Schedule 9 of the Electricity Act, so far as relevant, and any other relevant material considerations, one of which will be relevant aspects of the statutory Development Plan, including the National Planning Framework 4 (NPF4) and the Shetland LDP (adopted 2014).

1.5 Objectives and Purpose of the Scoping Report

1.5.1 The specific objectives of this report are to:

- seek agreement on the potential likely significant effects associated with the Proposed Development, and confirm that all potential likely significant effects have been correctly included in the proposed scope of the EIA ('scoped in');
- seek agreement where non-significant effects have been excluded ('scoped out'); and
- invite comment on the proposed approach to baseline data collection, prediction of environmental effects and the assessment of significance.

1.5.2 Unless consultees specifically request otherwise, all responses will be collated and presented as a Technical Appendix (TA) to the EIAR, as a record of the results of the scoping exercise.

1.6 Programme

1.6.1 The Applicant intends to submit an application for consent to Scottish Ministers in Q4 2025.

1.7 Public Consultation

1.7.1 The Applicant is committed to conducting extensive community consultation and engagement throughout the development process. Online communication such as a project website and email updates will strengthen traditional methods such as printed advertisements.

1.7.2 In accordance with established good practice, the Applicant is planning to host two rounds of public consultation events. Written public comments will be documented and analysed, with any adjustments incorporated to the Proposed Development design noted in the application materials.

1.8 Structure of this Report

1.8.1 The remainder of this report is structured as follows:

- **Section 2: Description of the Proposed Development** provides a brief description of the nature and purpose of the development, typical construction activities and decommissioning proposals.
- **Section 3: Scope of the EIA** provides a summary of the topics to be scoped in and scoped out of the EIAR, provides an outline of the consultation process and summarises the approach to the EIA.
- **Sections 4- 12:** Scoped in environmental topics with potential for significant effects. Each Section outlines the baseline conditions and overall assessment scope and methodology for the EIA.
- **Section 13: Topics Scoped Out of the EIA** provides a justification for why each topic has been scoped out of the EIA and that no significant effects are expected.
- **Section 14: Next Steps** outlines the procedure following the submission of the Scoping Report.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Description and Context

2.1.1 The Site (**Figure 1.1**) covers a total area of approximately 632.2 hectares (Ha). Settlement within approximately 500 m the Site is limited to scattered dwellings, in areas such as Toft, Brough and Garths Voe. Small settlements such as Firth and Mossbank are located approximately 900 m and 2.1 km from the Site, respectively.

2.1.2 The Site comprises an undulating plateau that ranges in elevation from mean high-water level at its northernmost extent by Ay Wick, to 116 m Above Ordinance Datum (AOD) at the Hill of Crooksetter located in the centre of the Site. Towards the southern end of the Site the topography gently undulates between 20 m AOD and 90 m AOD. The slackness of slopes in this part of the Site is associated with a number of lochans including Sand Water, Nugla Water and the Loch of Bordigarth. The Site also contains a number of burns and catchment channels such as the Aywick Burn and the Burn of Sand Water.

2.1.3 The Site comprises a combination of open heather moorland and grassland on peaty soils, which is used for rough grazing. The Site is typical of the wider landscape which exhibits a similar combination of hilly coastal terrain, small coastal islands and rocky coastal edges that mark the edge of the open waters of numerous voes (Orka Voe, Garths Voe, Tofts Voe and Firths Voe).

2.1.4 The northern extent of the Site overlaps with two designated sites, Yell Sound Special Area of Conservation (SAC) and Yell Sound Site of Special Scientific Interest (SSSI).

2.1.5 There are two Scheduled Monuments within the Site which are both prehistoric burial monuments in the form of chambered cairns, located to the north west and south east of the summit of the Hill of Crooksetter.

2.2 Proposed Development

Overview

2.2.1 Details of the Proposed Development will not be finalised until later in the EIA process. However, to facilitate agreement on the likely significant environmental effects of the Proposed Development, the description provided herein is based on parameters that provide an indication of the likely size, design and nature of the proposed development. These indicative parameters are of sufficient detail to determine a proportionate assessment scope for the EIA and as a basis for what will be presented in the EIAR.

2.2.2 The main elements of the Proposed Development would be as follows:

- up to 10 Wind Turbine Generators (WTGs) with a maximum tip height of 200 m[1];
- permanent foundations supporting each WTG, and associated laydown and crane hardstanding areas at each wind turbine base;
- a series of new on-site access tracks with associated watercourse crossings (where the final layout dictates), and associated turning heads and passing places;
- underground power cables and fibreoptic communications cables, generally laid in trenches alongside access tracks;

1 Based on current technology in 2025, WTG of this size will typically have a 'name plate' rated capacity of approximately 6MW per WTG, thus confirming a generation capacity of >50 MW, which determines that the proposed development would need consent under the Electricity Act 1989.

- an on-site substation, control building and provision for collection of meteorological data either by mast mounted equipment and sensors or remote sensing equipment;
- additional grid connection infrastructure, such as substations and cabling;
- temporary construction compounds and laydown areas; and
- a BESS compound of approximately 0.25 ha within the site[2], including ancillary equipment and co-located with the on-site substation.

2.2.3 In addition ancillary works may be necessary such as:

- extraction of rock from borrow pits;
- temporary on-site concrete batching plant; and
- off-site works to facilitate the delivery of abnormal loads (e.g. construction of over-run areas and temporary modification to street furniture etc).

2.2.4 The layout of the Proposed Development should be considered preliminary as it will evolve as survey information is gathered in relation to environmental and technical constraints. The evolution of the layout will also respond to stakeholder consultation feedback from the scoping process and parallel engagement with the local community.

Wind Turbines

2.2.5 For the purposes of Scoping, an indicative turbine layout is presented in **Figure 1.2**, and the coordinates of the turbine locations are presented in **Table 2.1.** The final number, location and specification of turbines will be determined by environmental, technical and commercial constraints identified during the EIA and iterative design process.

Table 2.1: Indicative layout turbine coordinates

Turbine Reference	X Coordinate	Y Coordinate
1	441620	1178108
2	441254	1177742
3	441870	1177654
4	442077	1177178
5	441268	1177226
6	441641	1176895
7	442440	1176846
8	441203	1176667
9	441705	1176345
10	442292	1176351

2.2.6 The worst case candidate turbine can differ across the EIA disciplines (for example noise, ornithology, transport etc.) therefore different candidate turbines may be specified in the EIAR

[2] With nominal storage capacity of 50 MWh (25 MW for 2 hours), however noting that the consent only seeks to confirm the physical size and indicative design of the BESS and not prescribe the electrical storage capacity

where necessary to inform assessments of effects and ensure that a reasonable worst case is presented.

2.2.7 The anticipated height of the wind turbines means that, under current regulations, there will be a statutory requirement for aviation lighting in accordance with Article 222 of the Air Navigation Order 2016. Any aviation lighting scheme will be agreed with the Civil Aviation Authority (CAA) and other relevant consultees.

2.2.8 A micro-siting allowance of up to 100 m for the turbines and other infrastructure would be considered in the EIAR. Micro-siting would potentially be used to respond to localised engineering or environmental constraints during the detailed design and construction. These allowances and proposed controls and change management procedures will be clearly defined within the EIAR and assessed as appropriate, including specifying restrictions on the proposed use of micro-siting to avoid additional or new significant effects.

2.2.9 The BESS would comprise a number of containerised units with ancillary equipment such as inverters. The BESS would store excess power generated by the Proposed Development and release the power in response to demand or grid capacity.

2.2.10 Biodiversity enhancement measures for the Site may include, but are not limited to, options such as peatland restoration. An Outline Biodiversity Enhancement and Management Plan (BEMP) would be developed for the operational phase of the Proposed Development and agreed with consultees.

Site Access

2.2.11 An access feasibility study has identified two potential Site access options:

- A new access junction on B9076, providing access into south of the Site; and
- Taking access off the private access road, which runs along the western boundary of the Site.

2.2.12 Access to the Site for abnormal indivisible loads (AIL) traffic will likely be from either the Port of Sullom Voe or Lerwick Harbour.

2.2.13 Prior to submission of the application for consent, potential construction traffic routes will be fully assessed, considering both vehicle numbers and the delivery of AIL to the Site to ensure the most appropriate solution is developed.

2.2.14 The proposed access route for general construction traffic and AIL will be clearly identified in the application submission.

2.2.15 Within the Site itself, the Proposed Development will be served by a network of new on-site access tracks to enable construction and operational maintenance. New access tracks will seek to minimise impacts on soils and peat. The layout of the access tracks will be determined based on the final turbine layout and the technical and environmental constraints on-site.

Grid Connection and Cabling

2.2.16 Grid connection does not form part of the application for consent for the Proposed Development. However, a grid connection application process is underway, and it is anticipated that there would be a connection locally, subject to network upgrades by the grid operator.

2.2.17 It is anticipated that electrical cabling connecting the turbines and the control building would be laid in trenches running alongside the access tracks, the layout of which would be determined by the final turbine layout and informed by consideration of relevant environmental receptors and effects, such as on-site ecological and ground conditions.

Construction

2.2.18 Typical construction activities and work methods will be set out in the EIAR. Information will also be provided on an indicative construction programme, construction traffic generation and construction phasing.

2.2.19 An Outline Construction Environmental Management Plan (CEMP) will also be submitted as part of the EIAR which will contain details of appropriate environmental management measures, including pollution prevention (in line with the Scottish Environment Protection Agency (SEPA) Pollution Prevention Guidelines (PPGs) and Guidance for Pollution Prevention (GPPs)), and waste minimisation and management measures.

Operation and Maintenance

2.2.20 The anticipated operational life of the wind turbines that form a key part of the Proposed Development is approximately 40 years although the Applicant does not seek a time-limited consent.

2.2.21 A wind farm is typically visited up to four times a month by a maintenance crew, and the BESS would require maintenance at a similar frequency. There would also be a requirement for maintenance of the access tracks and other ancillary infrastructure during the operational period.

Decommissioning

2.2.22 Following the operational phase of the project, the Proposed Development would either be decommissioned or repowered. Where decommissioning is required, this is anticipated to involve:

- dismantling and removal of the turbines, met masts, site substation, BESS facility, and any other above ground infrastructure; and
- removal to at least 1 m below ground level of the turbine and met mast foundations.

2.2.23 Detailed decommissioning proposals would be established and agreed with relevant authorities prior to commencement of decommissioning activities. This would take cognisance of guidance available at the time.

Community Benefit

2.2.24 The planning submission for the Proposed Development will be accompanied by a Socio-Economic Statement, in line with NPF4 Policy 11c. The Statement will set out in detail how the Proposed Development will maximise economic benefits, including how these benefits will be felt within the local community.

2.2.25 Community engagement events, planned as part of the planning process for the Proposed Development, will provide residents with the opportunity to give their views on the priorities for community benefit and how these can best be delivered.

2.3 Project Design and Alternatives

2.3.1 The Proposed Development layout will evolve in response to site survey information, environmental and technical constraints, stakeholder feedback, and feedback gathered through public engagement.

2.3.2 The EIAR will provide a chapter detailing and illustrating the design optimisation process followed and the reasonable alternatives considered in developing the wind farm layout and setting the physical parameters of the proposed turbines.

2.3.3 The Proposed Development design process will seek to establish a layout and turbine typology which take account of visibility from the surrounding environment and the key environmental constraints on-site and in the surrounding area, with the design also looking to deliver mitigation of adverse effects as far as is practicable.

2.3.4 Early feasibility work undertaken for the Proposed Development in April 2024 was used to guide the early design and layout of the wind farm element of the Proposed Development. A 'preferred development envelope' has been identified in the north of the site in response to the following factors:

- ornithological sensitivity and constraint in the south of the Site;
- nationally important heritage assets on Hill of Crooksetter (chambered cairns), sight lines and intervisibility with other heritage assets locally;
- residential receptors to the east of the Site at Brough and Toft;
- mitigating effects on the character of the coast and hinterland and on key visual receptors such as tourists (including vantage points and recreational routes), settlements, road users and ferry passengers by focusing development to the north of the Site; and
- avoiding gaps in the proposed turbine array.

2.3.5 Following completion of the main baseline environmental assessment, design objectives will be developed and used to evaluate a series of layout options. These layouts will be examined from key design viewpoints to assess and optimise the number, size and layout of the proposed wind turbines in relation to the landform of the Site and surrounds.

2.3.6 The design iteration process will take account of other environmental and technical factors to establish the final layout for the Proposed Development. Key sensitivities which are likely to influence the design process include:

- key views from surrounding settlements, landmark hills and transport corridors;
- the settings of designated cultural heritage assets in the surrounding area;
- sensitive ecological habitats, including blanket bog;
- groundwater dependant ecological habitats;
- watercourses and associated fisheries, riverine mammals and invertebrates; and
- breeding birds (disturbance and collision risk).

3. SCOPE OF THE EIA

3.1 Summary of Scope of EIA

Introduction

3.1.1 The EIA Regulations (regulation 4(3)) require consideration of the potential likely significant effects on the following factors:

- population and human health;
- biodiversity, and in particular species and habitats protected under Council Directive 92/43/EEC on the conservation of natural habitats and wild flora and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;
- land, soil, water, air and climate; and
- material assets, cultural heritage and the landscape.

3.1.2 For renewable energy projects in the UK, identification of potential impacts and assessment of those impacts to determine whether or not significant effect are likely on the above-mentioned factors is usually provided under the specialist topic categories as shown in **Table 3.1.**

3.1.3 The inclusion of a specialist topic category in an EIA process, and reporting of that assessment in the EIAR, will depend on the identification of potential likely significant effects. In relation to this, the proposed scope of the EIAR for the Proposed Development is set out in **Table 3.1.** For those topics proposed to be scoped out, further details and justification are included in **Section 14: Topics Scoped Out of the EIA**.

3.1.4 The EIAR will report on the likely significant effects, including, where applicable, direct, indirect, cumulative, short, medium and long-term, permanent and temporary, beneficial and adverse effects.

Table 3.1: Factors addressed in the scoping report

Factor	Where/how is this addressed?
Population and human health	The potential for effects on population and human health (including amenity) are considered under a number of topic headings including: • Effects on amenity attributed to Noise (see Section 9); • Effects on amenity attributed to Transport (see Section 10); • Effects on amenity attributed to Visual impact (see Section 4) and Shadow Flicker (see Section 13); and • Safety related impacts to Aviation (see Section 11). It is noted that no likely significant direct or indirect impacts on human health have been identified and it is proposed that this factor is not given further detailed consideration as part of the EIAR.
Biodiversity	Non-aviation ecology (species and habitats) are considered further in Section 6, including having

	regard to impacts on the biodiversity value of peatland habitat. Avian species are considered further in Section 7.
Land and soil	Land use would not materially change as a result of the Proposed Development and is therefore not proposed for further consideration. Soil impacts are considered further in Section 8, with a specific focus on impacts to the peat resource.
Water	On the basis of the adoption of standard good practice mitigation for effects on the water environment, it is considered that likely significant effects can be avoided. Further detail to support this is provided in Section 8.
Air and climate	No potential for likely significant effects on air have been identified and this is therefore not proposed for further consideration. No detailed climate "impact assessment" is proposed; however it is acknowledged that i) vulnerability to climate change related risk will be given due consideration in the description of the Proposed Development, and ii) the greenhouse gas footprint of the Proposed Development, including embodied carbon will be reported in the EIAR using the Scottish Government Carbon Calculator tool.
Material assets	Potential impacts to public road condition will be addressed through a stand-alone Transport Assessment, to be provided as an appendix to the EIAR. Potential impacts to telecommunication assets are considered in Section 12.
Cultural heritage	The potential for effects on the historic environment (cultural heritage) are considered further in Section 5.
Landscape	The potential for effects on the landscape is considered alongside visual amenity in Section 4.

Cumulative Effects

3.1.5 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration is also given to the cumulative effects which might arise from the proposal in conjunction with other existing and/or approved development proposals in the vicinity.

3.1.6 Cumulative effects are defined as those effects arising from the addition or combination of the Proposed Development to other existing proposed developments, or those arising from synergistic effects between factors.

3.1.7 The assessment of cumulative effects from the Proposed Development in combination with existing developments will be addressed during the assessment of effects of the Proposed Development, as pre-existing developments are part of the baseline environment. Cumulative effects will be addressed under each topic chapter.

3.1.8 Characteristics and thresholds of cumulative schemes to be considered as part of the assessment are set out in **Table 3.2.** Proposed Developments at the scoping or pre-application stage will not

be included in the assessment, as such proposals are not fully formed and may be subject to changes that cannot be foreseen. Any differences to this approach will be detailed in each technical assessment chapter.

Table 3.2: Cumulative planning application search characteristics and thresholds

Cumulative scheme characteristics	Thresholds
Cumulative schemes to be considered include: - those within 30 km of the site*; - onshore wind developments where a turbine or turbines are greater than 50 m to tip height; - schemes under construction; - schemes which have a valid consent; or - schemes which have been submitted to the relevant authorities but not yet determined (subject to a cut-off point to allow assessment to be undertaken) - schemes which have been submitted for scoping where they have a known timescale to planning submission and where they have potential to play an important part in the cumulative effects of wind energy development.	All considered schemes will need to: A) comprise a construction and/or operational phase that is concurrent with the Proposed Development; B) share common sensitive receptors/resources which are assessed and described in the supporting environmental documentation, and have the potential to be significantly affected by the combination of the approved (committed) development and the Proposed Development; and C) have sufficient environmental assessment information freely and publicly available to inform a cumulative effects assessment.
*NatureScot guidance[3] advises a 45 km study area is used for the cumulative assessment of onshore wind turbines, however, a 30 km study area is considered to be proportionate given the location of the Proposed Development and the established and emergent pattern of development. For further details please see paragraph 4.3.2 in **Section 4: Seascape, Landscape and Visual Amenity**.	

3.1.9 It should be noted that not all cumulative developments would necessarily have a cumulative effect in respect of any particular environmental topics and therefore each technical assessment will provide a full justification for the list of schemes considered in their respective assessments.

3.1.10 As the cumulative baseline is constantly evolving, the schedule of cumulative schemes to be included in the assessment will be finalised following consultation with the relevant consultees and at the point a finalised design is reached (approximately four months prior to submission).

3.2 Consultation

3.2.1 Consultation alongside the EIA process is critical to the development of a comprehensive and proportionate EIAR. The views of statutory and non-statutory consultees are important to ensure that the EIA from the outset focuses on specific issues where significant environmental effects are likely, and where further investigation is required.

3.2.2 The consultation, as an ongoing process, enables embedded and additional mitigation measures to be incorporated into the Proposed Development to limit adverse environmental effects and optimise environmental benefits. Early and ongoing engagement with consultees will be important to

3 NatureScot (2021). *Guidance – Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments*. Available at https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments [Accessed January 2025].

influence the design process of the Proposed Development by seeking an appropriate level of feedback from consultees, to ensure that comments are considered in the evolving design.

3.2.3 No consultation has been undertaken with statutory and non-statutory consultees prior to the submission of this Scoping report. Following submission of this Scoping Report and as part of the EIA process, consultation will be undertaken with a range of statutory and non-statutory consultees.

3.2.4 The Applicant intends to carry out community consultation, with two public exhibitions. The outcome of the consultation process will be compiled into a Pre-Application Consultation Report to accompany the application for consent, detailing the consultation undertaken and any changes made to the Proposed Development as a result of this consultation.

4. SEASCAPE, LANDSCAPE AND VISUAL AMENITY

4.1 Overview

4.1.1 This Section provides an overview of the Seascape, Landscape and Visual receptors in relation to the Proposed Development and sets out the scope and methodological approach for the Seascape, Landscape and Visual Impact Assessment (SLVIA) in respect of the Proposed Development.

4.1.2 This Section is supported by the following figures **(Appendix A)**:

- **Figure 4.1: Seascape and Landscape Character;**
- **Figure 4.2: Landscape Designations and Classifications;**
- **Figure 4.3: Visual Receptors;**
- **Figure 4.4: Preliminary Zone of Theoretical Visibility (ZTV) and Preliminary Assessment Viewpoints;** and
- **Figure 4.5: Preliminary Cumulative Plan.**

4.2 Baseline Conditions

Topography and Hydrological Features

4.2.1 The Proposed Development is set within a coastal landscape that is typified by a combination of hilly coastal terrain, small coastal islands, rocky coastal edges that mark the edge of the open waters, and numerous voes (e.g. Orka Voe, Garths Voe, Tofts Voe and Firths Voe). Other water features in the Study Area comprise natural lochs and lochans within peatlands.

4.2.2 The Site itself comprises an undulating plateau that ranges in elevation from mean high-water level at its northern most extent by Ay Wick, to 116 m AOD at the Hill of Crooksetter, at the centre of the Site. Towards the southern end of the Site the topography gently undulates between 20 m AOD and 90 m AOD. The slackness of slopes in this part of the Site contains Sand Water, Nugla Water Lochans and Loch Bordigarth.

4.2.3 The Site also contains a number of burns and catchment channels, including:

- Aywick Burn, which outfalls into the sea at the northern end of the Site; and
- The Burn of Sand Water, which discharges to Firths Voe via Sodles Burn.

Landuse and Landcover

4.2.4 Predominant landcover and land uses in the Study Area range from:

- open heather moorland and grassland on peaty soils which is used for rough grazing;
- small scale settlements and scattered dwellings;
- regionally important roads and access tracks;
- wind turbines:
    - Viking Wind Farm (operational), which is located approximately 10 km south of the Site; and
    - Beaw Field Wind Farm (consented), which is located approximately 9 km to the north east of the Site.

- Scatsta Airport, which is located around 2.4 km to the south west of the Site;
- industrial areas:
    - Sullom Voe Oil Terminal, which is located approximately 100 m west of the Site; and
    - EMN, Sella Ness and Ocean Kinetics sites and associated wharf, which are located approximately 1.5 km south west of the Site.
- Toft and Ulsta ferry ports, which are located approximately 700 m and 3.7 km from the Site on either side of the Yell Sound.

4.2.5 The principal concentrations of settlements in the Study Area comprise:

- Mossbank, which is the largest settlement in the Study Area and is located approximately 2 km east of the Site;
- Firth which comprises the Midlea, Southlee and Leaside hamlets, forming a linear settlement concentrated on the southern side of the Mossbank coastal road, overlooking Firths Voe. This settlement is located approximately 1 km to the east of the Site;
- Toft and Brough, which are small hamlets situated less than 500 m from the eastern boundary of the Site, whose amenity is largely derived from a combination of the open seaward views and inland views of open moorland;
- Ulsta, which is situated around 4 km to the north east of the Site beyond Yell Sound; and
- Hamnavoe and Lunna settlements on the Lunna Ness peninsula, approximately 7 km to the south east of the Site.

4.2.6 Further scattered properties are present in Graven, which is located immediately south east of Garths Voe and along the B9076, over 1 km south west of the Site.

4.2.7 The Study Area contains a limited road network that is primarily concerned with enabling access to settlement, scattered properties, industries and ferry ports. Key routes present comprise:

- The A968, a section of which bisects Yell, terminating at the ferry port at Ulsta, and recommences at Toft, extending southwards past Dales Voe on the Mainland;
- A970, which commences at Hillside and Olna Firth, thereafter, connecting to the Ness of Hillswick, at the westernmost extent of the Study Area, and North Roe, to the north west;
- B9071, which is a minor local road that provides access to the Lunna Ness peninsula, over 6.7 km to the south east of the Site;
- B9076, which connects the A968 at Firths Voe to Trondavoe in the south via Scatsta Airport; and
- B9079, which is a short route between Ollaberry and the A970 by North Guss.

<u>Seascape and Landscape Character</u>

4.2.8 **Figure 4.1 (Appendix A)** shows the location and extents of Landscape Character Types (LCTs) and Seascape Character Units (SCUs).

Landscape Character

4.2.9 There is potential for significant adverse effects on a number of landscapes in the Study Area, including:

- LCT 349: Major Uplands, the closest unit of which abuts the southern boundary of the Site;
- LCT 351: Undulating Moorland and Lochs, the closest unit of which is situated west of Sullom Voe, around 5 km from the Site;
- LCT 353: Farmed and Settled Lowlands and Coast, which at its closest, is situated around 6 km west north west of the Site, on the side of Yell Sound;
- LCT 355: Coastal Edge, which at its closest, is situated around 6 km west north west of the Site, on the side of Yell Sound; and
- LCT 356: Small Uninhabited Islands, the closest of which is Little Roe which is located at the confluence of Yell sound and Sullom Voe, around 2 km to the west north west of the Site.

4.2.10 The most critical LCTs/character units within the wider Study Area are LCT 349 and 351 which, on North Roe, coincide with Ronas Hill and North Roe Wild Land Area (WLA), which is a nationally important landscape valued for its remoteness, the absence of man-made artefacts and its darkness at night.

4.2.11 The Site is located in LCT 350: Peatland and Moorland. This LCT occurs extensively across Yell, Unst and Fetlar, and between Selivoe, Culswick and Skeld on the Shetland Mainland. This LCT typically forms an important backdrop and prominent skyline in views from adjoining coastal landscapes and seascapes (e.g. LCT 354: Farmed and Settled Voes) as well as Inland Valleys (i.e. LCT 352: inland Valleys).

Seascape Character

4.2.12 The Seascape Character in the Study Area is predominantly Seascape Unit 13 D: Islands, Sounds and Voes. The Voes and Sounds form sheltered narrow channels of coastal waters between open sloping hinterland of pasture, rough grazing and scattered crofting. On the outer areas of the Study Area Seascape Unit 1: Remote High Cliffs are present towards the south west, north west, north and north east of the Site. This Unit forms a dramatic, exposed seascape with views over small islands to open sea.

4.2.13 The vast open horizontal form of these Units allows for large scale open panoramas, emphasising the importance of landmasses and distant hills that bound views. In this context vertical elements either on shore or in the marine environment can be particularly prominent and detract from the remote character of the seascapes.

Landscape Designations and Classifications

4.2.14 **Figure 4.2 (Appendix A)** shows the location and extent of landscape designations and classifications.

Landscape Designations

4.2.15 The National Scenic Area (NSA) 1: Shetland is located on the outer edges of the Study Area. The Site is located around 12 km south east, east and north east from the NSA. The NSA is characterised by coastal views close and distant, memorable coastal cliffs and a sense of remoteness, solitude and tranquillity.

4.2.16 Four Local Landscape Areas (LLAs) exist within the Study Area. The Site is located approximately 7.5 km south east of LLA 1: Ronas Hill, 10 km south of LLA 17: West Sandwick to Gloup Holm, 8 km east of LLA 2: Nibon and Mangaster and 8.5 km west of LLA 12: Lunna Ness and Lunning.

Classifications

4.2.17 The Site is also located approximately 9 km south east of the Ronas Hill and North Roe Wild Land Area (WLA) and 7 km north west of the Luna House Garden and Designed Landscape (GDL), both of which are nationally important landscapes.

Ronas Hill and North Roe WLA has a *"'stunning' variety of extensive coastline and a sense of remoteness, solitude and tranquillity."*[4]

4.2.18 Lunna House GDL (GDL00271) is situated approximately 7 km to the south east of the Proposed Development, consisting of a formal designed landscape, laid out in characteristic Shetland style with garths, walled enclosures, eyecatchers and ancillary buildings.

Visual Receptors

4.2.19 As shown on **Figure 4.3**, there are numerous visual receptors that could be significantly affected by the type of development proposed. These are generally situated close to the coastline, where the principal concentrations of settlement, transportation routes and tourism occur, including those offshore such as sea kayakers, boat and ferry passengers.

4.2.20 Settlement in the Study Area that is likely to be affected by the Proposed Development includes:

- Mossbank;
- Firth;
- Toft and Brough;
- Ulsta;
- Hamnavoe and Lunna; and
- Scattered properties by Garths Voe.

4.2.21 Key transportation corridors within the Study Area include:

- The A968;
- The A970;
- The B9071;
- The B9076; and
- The B9079.

4.2.22 Key Ferry routes within the Study Area include:

- Toft-Ulsta ferry route;
- Vidlin-Bruray ferry route; and
- Symbister-Laxo ferry route.

4.2.23 The Zone of Theoretical Visibility (ZTV) shown in **Figure 4.4 (Appendix A)** indicates there is also likely to be visibility from coastal waters in the Yell Sound and further out to the east towards Head

4 NatureScot (2014). *Wild Land Areas* map and descriptions. Available at: https://www.nature.scot/doc/wild-land-areas-map-and-descriptions-2014 [Accessed February 2025].

of Lambhoga and Skaw Taing. Consequently, it is likely water-based receptors such as kayakers and users of other boats would have views of the wind turbines, and the lighting associated with the turbines.

4.3 Assessment Scope and Methodology

Key Terms of Reference

4.3.1 The SLVIA will be prepared in accordance with the following guidance and professional standards:

- NPF4[5];
- Environmental Impact Assessment Handbook, Version 5, Appendix 2: Landscape and Visual Impact Assessment[6];
- Guidance for Landscape and Visual Impact Assessment (GLVIA) Third Edition, and subsequent technical notes and clarifications[7];
- Landscape Character Assessment: Guidance for England and Scotland[8];
- Guidance for Assessment of Effects on Special Landscape Qualities (AESLQ)[9];
- Technical Guidance Note 06/19 Visual Representation of development proposals[10];
- Technical Guidance Note 02/19 Residential Visual Amenity Assessment[11];
- Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments[3];
- Landscape Sensitivity Assessment Guidance[12];
- Siting and Designing Wind Farms in the Landscape Guidance - Version 3a[13];
- Assessing impacts on Wild Land Areas[14];
- Visual Representation of Windfarms Guidance, Version 2.2[15];
- Pre-application Guidance for Onshore Wind Farms[16]; and

5 Scottish Government (2023). *National Planning Framework for Scotland 4*. Available at: National Planning Framework 4 - gov.scot [Accessed January 2025]
6 SNH & HES (2018) *Environmental Impact Assessment Handbook*. Available at https://www.nature.scot/sites/default/files/2018-05/Publication%202018%20-%20Environmental%20Impact%20Assessment%20Handbook%20V5.pdf [Accessed January 2025]
7 Landscape Institute and Institute of Environmental Management and Assessment (2013). *Guidance for Landscape* and Visual *Impact Assessment (GLVIA).* Available at https://www.landscapeinstitute.org/technical/glvia3-panel/ [Accessed January 2025]
8 The Countryside Agency and SNH (2002). *Landscape Character Assessment: Guidance for England and Scotland.* Available at https://www.nature.scot/doc/archive/landscape-character-assessment-guidance-england-and-scotland [Accessed January 2025]
9 NatureScot (2024). *Guidance for Assessment of Effects on Special Landscape Qualities.* Available at https://www.nature.scot/doc/guidance-assessment-effects-special-landscape-qualities-aeslq [Accessed January 2025]
10 Landscape Institute (2019). *Technical Guidance Note 06/19 Visual Representation of development proposals.* Available at https://www.landscapeinstitute.org/news/new-visual-representation-guidance-2019/ [Accessed January 2025]
11 Landscape Institute (2019). *Technical Guidance Note 02/19 Residential Visual Amenity Assessment* Available at https://www.landscapeinstitute.org/news/new-rvaa-guidance-2019/ [Accessed January 2025]
12 NatureScot (2022). *Landscape Sensitivity Assessment Guidance*. Available at Landscape Sensitivity Assessment Guidance (Methodology) | NatureScot [Accessed January 2025]
13 NatureScot (2017). *Siting and Designing Wind Farms in the Landscape Guidance - version 3a.* Available at https://www.nature.scot/doc/siting-and-designing-wind-farms-landscape-version-3a [Accessed January 2025]
14 NatureScot (2020). *Assessing impacts on Wild Land Areas.* Available at https://www.nature.scot/doc/assessing-impacts-wild-land-areas-technical-guidance [Accessed January 2025]
15 NatureScot (2017). *Visual Representation of Windfarms Guidance, Version 2.2*. Available at https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf [Accessed January 2025]
16 NatureScot (2024). *Pre-application Guidance for Onshore Wind Farms*. Available at https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms [Accessed January 2025]

- Guidance on aviation lighting-impact-assessment[17].

Study Area

4.3.2 NatureScot's Guidance on the Visual Representation of Windfarms Guidance, Version 2.2[15] advocates the adoption of a 45 km Study Area for turbines of over 150 m. However, it has been determined that a more appropriate and proportionate Study Area for the SLVIA is 30 km, which is considered adequate for identification of significant seascape, landscape and visual effects. The suggested Study Area is based on an analysis of:

- the main concentrations of landscape and visual receptor locations (as identified in **Figure 4.1**, **Figure 4.2** and **Figure 4.3 (Appendix A)**);
- the geographical extent of the Proposed Developments viewshed (as illustrated in the ZTV on **Figure 4.4 (Appendix A)**); and
- the distribution of existing large scale commercial wind energy development (as depicted in **Figure 4.5 (Appendix A)**).

Study Area for Recreational Routes

4.3.3 The SLVIA will consider effects on national and regionally important recreational routes across the entire SLVIA Study Area. Core paths and local footpaths will be considered up to 10 km from the Proposed Development.

Study Area for Residential Visual Amenity

4.3.4 In line with Technical Guidance Note 02/19 Residential Visual Amenity Assessment, Landscape Institute (2019)[11] a 2 km Study Area would be adopted for the assessment of effects on the visual amenity of individual properties.

Baseline Characterisation

4.3.5 In order to establish the baseline context for the SLVIA, a combination of a desk study and field reconnaissance has been/will be undertaken.

4.3.6 Data and published information utilised to date include:

- Scottish Landscape and Character Types Map and Descriptions, NatureScot, digital mapping published 2019[18];
- An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms Scottish Natural Heritage Commissioned Report No.103 (SNH, 2005)[19];
- Ordnance Survey (OS) 1:50,000 and 1:250,000 mapping;
- OS 50 m and 5 m Digital Terrain Model data;
- OS Addressbase data;
- National Scenic Areas - Scottish Government data sets;

17 NatureScot (2024). *Guidance on aviation lighting-impact-assessment*. Available at https://www.nature.scot/doc/guidance-aviation-lighting-impact-assessment [Accessed January 2025]
18 NatureScot (2019). *Landscape Character Types Map and Descriptions*. Available at https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions [Accessed February 2025].
19 SNH (2005). *An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms Scottish Natural Heritage Commissioned Report No.103.* Available at https://www.nature.scot/doc/naturescot-commissioned-report-103-assessment-sensitivity-and-capacity-scottish-seascape-relation [Accessed February 2025]

- Gardens and Designed Landscapes - Historic Environment Scotland dataset;
- Wild Land Areas - NatureScot data sets; and
- Road network - OS Meridian 2 data sets.

4.3.7 Field reconnaissance and site visits were undertaken in September 2024 to aid the preparation of scoping inclusions. A second phase of detailed field reconnaissance is planned for the summer of 2025 to further verify seascape, landscape and visual baseline characteristics and to visit key receptor locations and viewpoints. To aid field reconnaissance and the assessment of residual effects dataloggers, mapping and augmented reality systems will be used that provide a high degree of accuracy as to the visibility of the Proposed Development as well as cumulative developments.

4.3.8 In addition to general field reconnaissance, visits to properties within 2 km of the Proposed Development will be undertaken to assess effects on their visual amenity. This is, however, reliant upon access to properties being provided by homeowners. Failing this, the assessment would be undertaken from the nearest publicly accessible location to each property.

Assessment Viewpoints

4.3.9 In order to inform and verify the findings of the SLVIA, a series of assessment viewpoints are proposed, as presented in **Table 4.1**. These viewpoints have been selected to represent a range of seascape and landscape types as well as relevant landscape designations and classifications and a range of visual receptors. They have also been selected to represent a reasonable and proportionate geographical spread of locations at different distances, altitudes and directions from the Site.

Table 4.1: Preliminary Assessment Viewpoints

Viewpoint	Location, Distance and Direction from Proposed Development	Coordinates (X,Y)	Landscape Receptor	Visual Receptors
1	Minor Track North Roe 11 km NW	437195 1189778	Farmed and Settled Lowlands and Coast (LCT 353)[20]. Shetland National Scenic Area (NSA)[21].	Local road users and nearby residential properties.
2	Mid Field Cairn (WLA) 11.5 km NW	431615 1183909	Major Uplands (LCT 349). Ronas Local Landscape Area (LLA)[22].	Hill walkers.
3	Ollaberry. St Magnus' Church 5.4 km NW	436748 1180548	Farmed and Settled Voes and Sounds (LCT354).	Users of car park, road users and nearby residential receptors.
4	Ulsta Shetland Ferry Terminal, Yell	446224 1179493	Farmed and Settled Voes and Sounds (LCT354).	Ferry passengers, residential

20 Based on NatureScot's online character assessment and descriptions, available at https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions.

21 Based on NatureScot's published mapping and descriptions available at https://www.nature.scot/doc/naturescot-commissioned-report-255-identifying-special-qualities-scotlands-national-scenic-areas.

22 Based on Shetland Islands Council's map of designated sites (2014) available at https://www.shetland.gov.uk/downloads/file/1936/designated-sites-maps

Viewpoint	Location, Distance and Direction from Proposed Development	Coordinates (X,Y)	Landscape Receptor	Visual Receptors
	4.6 km NE			receptors, car park/road users.
5	Parking at Outrabister, Lunna Ness 8.8 km SE	450332 1172424	Farmed and Settled Voes and Sounds (LCT354).	Nearby residential receptors, car park/road users.
6	Gardaness Hill 5.8 km ESE	443797 1170055	Farmed and Settled Voes and Sounds (LCT354).	Hill walkers.
7	Brough 1.6 km E	443685 1177440	Farmed and Settled Voes and Sounds (LCT354).	Residential receptors and road users.
8	Ferry Port – Toft 1.7 km SE	443721 1176127	Farmed and Settled Voes and Sounds (LCT354).	Ferry passengers, residential receptors, car park/ road.
9	Vantage Point by Houb of Scatsta 3.5 km SW	439821 1172880	Farmed and Settled Voes and Sounds (LCT354).	Visitors to vantage point, nearby residential receptors and road users.
10	Cairn at Hill of Graven 3.3 km WSW	440503 1172726	Major Uplands (LCT349).	Hill walkers and visitors to cairn.
11	Minor Road between Southlee and Graven 2.7 km S	442331 1172827	Major Uplands (LCT349).	Nearby residential receptors and road users.
12	Crooksetter NW cairn 0.8 km S	441762 1175901	Peatland and Moorland (LCT 350).	Hill walkers and visitors to cairn.
13	Gluss Ayre 4.4 km W	436881 1177462	Peatland and Moorland (LCT 350).	Visitors to Gluss island and nearby residential receptors.
14	Minor Road south of Sullom 7.3 km SW	435118 1172759	Farmed and Settled Voes and Sounds (LCT354).	Residential receptors in hamlet.
15	A970 Layby, Burraland 8.5 km SW	433300 1174573	Undulating Moorland with Lochs (LCT351).	Road users.

Viewpoint	Location, Distance and Direction from Proposed Development	Coordinates (X,Y)	Landscape Receptor	Visual Receptors
16	A970 west of Brae 11.0 km SW	434258 1168161	Undulating Moorland with Lochs (LCT351).	Road users.
17	Minor road - Newhouse, Lunna Ness 9 km SE	449850 1171208	Farmed and Settled Voes and Sounds (LCT354).	Nearby residential receptors, cyclists and road users.
18	A968/NCR1, Yell 7 km NE	445316 1184296	Farmed and Settled Voes and Sounds (LCT354).	Nearby residential receptors, cyclists and road users.
19	B9081, west of Loch of Littlester, Yell 9 km ENE	450607 1179775	Farmed and Settled Voes and Sounds (LCT354).	Residential receptors and road users.
20	A986/NCR1, South of Firths Voe 3.5 km SE	444591 1173120	Major Uplands (LCT349).	Road users.

4.4 Likely Significant Effects

Potential Impacts Scoped In

4.4.1 The SLVIA will identify and assess potential significant effects (including cumulative effects) on the seascape, landscape and visual resource as described in **Section 4.2: Baseline Conditions**.

4.4.2 The SLVIA will address effects arising from the construction and operation of the Proposed Development and will focus upon effects on:

- The landscape fabric of the Site (i.e. physical elements of the landscape at the Site). No off-site effects are anticipated currently;
- Seascape and landscape character within the Study Area arising from changes to characteristic elements and perceptual aspects of the seascape and landscape;
- The special qualities and integrity of landscape designations and classifications; and
- The visual amenity of settlements and individual properties, transportation routes (including ferry routes), and recreational routes and vantage points (including hill summits).

Issues Scoped Out

4.4.3 Effects on WLAs will be omitted from the SLVIA on the basis that the Proposed Development is not within such a classified area, and as stated in NPF4 policy 4g, *"Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.*[5]*"*

4.4.4 Decommissioning effects will also be omitted from the SLVIA as they are expected to be of a similar or lesser extent to those occurring during the construction stage of the Proposed Development. It is also the case that scrutiny of decommissioning operations are better dealt with as part of the

consideration of the decommissioning plan that will be required in advance of the end of the operational life of the Site.

Cumulative Effects

4.4.5 The SLVIA will address cumulative seascape, landscape and visual effects and will consider:

- In-Addition cumulative effects (i.e. the additional effects attributable to the Proposed Development in the context of other wind farm developments); and
- In-Combination effects (i.e. the combined or total effect of all wind energy developments within the Study Area).

4.4.6 The cumulative assessment will also consider:

- Concurrent and/or consecutive (concurrent) visibility (where the observer is able to see two or more developments from one viewpoint location); and
- Sequential effects (where a number of similar developments would be visible individually or simultaneously over a sequence of connected viewpoints, such as would be found along a road or footpath).

4.4.7 The SLVIA will consider two cumulative scenarios:

- Cumulative Baseline: including existing operational developments and consented, but currently unbuilt developments; and
- Future Cumulative Context: including the Cumulative Baseline with proposed wind farms (those subject to a formal planning application).

4.4.8 This accords with current NatureScot guidance[3]. Occasionally it may be appropriate to include proposals in an assessment which are at earlier stages of development (including at scoping), particularly where clusters of development or "hotspots" emerge, or where proposals are adjacent to one another. However, such schemes are often subject to considerable uncertainty and are likely to change significantly prior to lodging a formal application. However, such schemes are often subject to considerable uncertainty and are likely to change significantly prior to lodging a formal application.

4.5 Questions to Consultees

Table 4.2: Questions to Consultees

Q4.1: Are the Study Areas for the SLVIA proposed acceptable and proportionate?
Q4.2: Are the suggested omissions (decommissioning effects and effects on Wild Land) acceptable?
Q4.3: Is the list of preliminary assessment viewpoints sufficient. If not, which additional or alternative viewpoint locations would consultees propose?

4.6 Additional Consultation

4.6.1 Subject to responses to this scoping submission, no further detailed consultations in respect of the SLVIA are anticipated. However, in the event of substantive issues being raised by consultees in respect of the proposed scope, methodologies and/or assessment viewpoints, further consultations may be required. Further consultations would be targeted, and/or addressed in the subsequent Gate Check report to help minimise additional demands on consultees and to allow for a proportionate and timely submission.

5. CULTURAL HERITAGE

5.1 Overview

5.1.1 This Section has been prepared by AOC Archaeology Group and summarises the potential environmental impacts and likely significant effects upon Cultural Heritage receptors that are anticipated to arise in connection with the construction and operation of the Proposed Development. In addition, this Section outlines the baseline archaeological and cultural heritage conditions within the Site and Study Areas and outlines the methodology that will be utilised for the identification and assessment of direct and settings effects within the EIA Report.

5.1.2 This Scoping Report is supported by the following figures **(Appendix A)** and report **(Appendix B)**:

- **Figure 5.1: Heritage Assets within the 1 km Study Area;**
- **Figure 5.2: Designated Heritage Assets within the 10 km Study Area;** and
- **Figure 5.3: Preliminary Zone of Theoretical Visibility (ZTV) and Cultural Heritage Viewpoints.**
- **Appendix B: Gazetteer of Heritage Assets and Events**

5.1.3 No direct consultation with relevant consultees, namely Historic Environment Scotland (HES) and the Shetland Regional Archaeologist on behalf of the SIC has been undertaken to date.

5.1.4 This Scoping Report constitutes the initial consultation with the consultees. Further direct consultation with consultees may be required, and if necessary, will be undertaken during the EIA process.

5.2 Baseline Conditions

5.2.1 This scoping baseline has been informed by a review of the National Record of the Historic Environment (NRHE) data held by HES[23], and a review of historic mapping available online via the National Library Scotland (NLS). The location of all heritage assets within 1 km of the Site are shown on **Figure 5.1 (Appendix A)** and designated heritage assets within 10 km of the Site are shown on **Figure 5.2 (Appendix A)**. Where designated heritage assets have been discussed in the following text, these assets have been labelled on **Figures 5.1** and **Figure 5.2 (Appendix A)**.

5.2.2 Sites and Monuments Record (SMR) data, available from Shetland Amenity Trust (SAT), has not yet been consulted, but would be for the EIA Report. Historic maps, which are held by the NLS[24], have been consulted. Historic mapping has been used to provide a brief description of past land uses in the Site. A more detailed historic map regression will form part of the EIA Report. HES's Historic Land-use Assessment (HLA) map[25], which contains data on past and present land use, has also been consulted.

5.2.3 Each heritage asset identified has been given an Asset Number unique to this Scoping Report. A Gazetteer of Heritage Assets and Events **(Appendix B)** includes information regarding the type, period, location, reference number, designation and any other relevant descriptions, as derived from the consulted sources.

5.2.4 The British Geological Survey[26] (BGS) records that the Site consists predominantly of peat, a sedimentary superficial deposit formed during the Quaternary period and of occasional bands of glacial deposits – Diamicton, a sedimentary superficial deposit also formed during the Quaternary

23 HES, Downloads 2024, Available at: https://portal.historicenvironment.scot/downloads [Accessed January 2025]
24 NLS, 'National Library of Scotland – Maps', 2024. Available at: https://maps.nls.uk/ [Accessed January 2025]
25 HES, 'HLAmap – Scotland's Historic Land Use', 2024, Available at: https://hlamap.org.uk/ [Accessed January 2025]
26 British Geological Survey, 2025. BGS Geology Viewer. Available at: https://www.bgs.ac.uk/ [Accessed January 2025]

period. The majority of the Site is underlain by a Graven Complex – Granodiorite bedrock, while the north western part of the Site is underlain by a Yell Sound Psammite Formation bedrock. The HLA map does not contain any data for the majority of the Site, although a small central section is recorded as rough grazing *"lower-lying land that shows no evidence of recent agricultural improvement"*[27].

5.2.5 The Ordnance Survey map of the late 19th century indicates that the Site consisted mainly of rough moorland. Three unroofed buildings are visible on the OS map of 1881[28] which depict a small settlement annotated as Tronaster (Asset 91). These buildings are still partially visible on Satellite imagery of the Site, along with other unrecorded unroofed buildings which may be related to the settlement. The OS map of 1881 also shows a long field boundary (Asset 106) running from the coast to the north west to Neshion Water. Satellite imagery and modern OS maps suggest that this field boundary may still exist along its route in the form of a stone wall.

Designated Heritage Assets

5.2.6 There are two designated heritage assets recorded within the Site. Both of these are prehistoric burial monuments in the form of chambered cairns, located to the north west (Asset 35) and south east (Asset 32) of the summit of the Hill of Crooksetter.

- Scheduled Crooksetter Hill, chambered cairn at SE summit of (SM3576 - Asset 32); and
- Scheduled Crooksetter Hill, chambered cairn near NW summit of (SM3608 - Asset 35).

5.2.7 Within 1 km of the Site, there are three Scheduled Monuments and one Category B Listed Building:

- Scheduled Fugla Ness, broch 330m NNW of (SM2080 - Asset 6);
- Scheduled Auchensalt, burnt mound 85m E of (SM3556 - Asset 19);
- Scheduled Norden, burnt mound 160m ESE of (SM3557 – Asset 20); and
- Category B Listed Garth, Pony Pund, Including Gates, And Adjoining Outbuildings (LB44527 – Asset 41).

5.2.8 Between 1 km and 5 km of the Site, there are:

- two Scheduled Brochs (SM2058 – Asset 4 and SM2091 – Asset 7);
- a Scheduled homestead (SM3465 – Asset 10);
- two Scheduled Chambered Cairns (SM3524 – Asset 16 and SM3564 – Asset 23);
- a Scheduled Battery (SM10756 – Asset 38);
- three Category B Listed Buildings (LB44533 – Asset 42; LB44534 – Asset 43 and LB44562 – Asset 107); and
- five Category C Listed Buildings (LB18679 – Asset 44; LB44529 – Asset 45; LB44530 – Asset 46; LB44531 – Asset 47 and LB44532 – Asset 48).

5.2.9 Between 5 km and 10 km of the Site, there are:

- 27 Scheduled Monuments (Assets 1-3, 5, 8-9, 11-15, 17-18, 21-22, 24-37);
- one Garden and Designed Landscape (GDL) (GDL00271 – Asset 39); and

27 HES, 'HLAmap – Scotland's Historic Land Use', 2025, Available at: https://hlamap.org.uk/ [Accessed January 2025]
28 Shetland, Sheet XXV, 1881. Survey date: 1878, Publication date: 1881. Available at: https://maps.nls.uk/view/228780793 [Accessed January 2025]

- one Category A Listed Building (LB18648 - Asset 40).

Non-Designated Heritage Assets

5.2.10 The NRHE records three non-designated heritage assets within the Site:

- a small settlement at Tronaster (Canmore ID 189728 - Asset 91);
- a sheepfold (Canmore ID 345485 - Asset 93); and
- a field boundary identified on the OS map of 1881 (Asset 106).

5.2.11 Within 1 km of the Site, the NRHE records 58 non-designated heritage assets and six previous archaeological events. The assets are mostly post-medieval farmsteads and associated agricultural buildings:

- Various buildings (Assets 57, 61, 63-67, 75, 82, 84-87);
- Air raid shelter (Asset 60);
- Aircraft (Assets 112 and 113);
- Anti-aircraft battery (Asset 55);
- Brig (Asset 110);
- Clearance cairn (Asset 54);
- Farmstead (Assets 71, 74, 76-77, 79-81, 88-90, 93-95, 97-101);
- Mill (Assets 49, 53 and 73);
- Craft (Assets 111 and 116);
- Military camp (Asset 56);
- Marine obstructions (Assets 114-115 and 117);
- Pier (Asset 68);
- Township (Assets 69 and 92);
- Water tanks (Asset 59 and 62);
- Winch (Asset 50);
- Chapel (Asset 51 and 58); and
- Enclosures (Assets 70, 72, 78 and 96).

5.3 Assessment Scope and Methodology

Key Terms of Reference

5.3.1 The following guidance documents will be consulted during the assessment to assist in the determination of potential effects on heritage assets:

- Planning Advice Note 2/2011: Planning and Archaeology[29];

29 Scottish Government (n.d) *Planning Advice Notes PAN and Guidance*. Available at: https://www.gov.scot/collections/planning-advice-notes-pans/ [Accessed January 2025]

- Managing Change in the Historic Environment: Setting[30];
- Environmental Impact Assessment Handbook v5[6];
- Institute for Archaeologists' (CIfA) Code of Conduct[31];
- CIfA Regulations for Professional Conduct[32];
- CIfA Standard and Guidance for Historic Environment Desk Based Assessment[33]; and
- CIfA Standard and guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment[34].

5.3.2 The assessment will distinguish between the terms 'impact' and 'effect'. An impact is defined as a physical change to a heritage asset or its setting, whereas an effect refers to the significance of this impact.

5.3.3 Assessment of direct effects resulting from the construction phase will relate to whether the construction of the Proposed Development would remove, in part or whole, elements of the asset. The level of direct effect will be a result of the importance of the assets and the magnitude of impact predicted.

5.3.4 The setting assessment will be undertaken with reference to HES' Managing Change Guidance on setting[35] and will aim to establish the current setting of the identified heritage assets, how that setting contributes to the understanding, appreciation and experience of those assets and how the Proposed Development could impact upon this.

5.3.5 NPF4 Policy 7h[5] indicates that development proposals affecting Scheduled Monuments will only be supported where:

'*i. direct impacts on the scheduled monument are avoided;*
ii. significant adverse impacts on the integrity of the setting of a scheduled monument are avoided; or
iii. Exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised'

5.3.6 Significant adverse impacts on integrity of setting are judged here to relate to whether a change would adversely affect the asset's key attributes or elements of setting which contribute to an asset's significance. It is considered that a significant impact upon the integrity of the setting of an asset will only occur where the degree of change that will be represented by the Proposed Development would adversely alter those factors of the monument's setting that contribute to cultural significance such that the understanding, appreciation and experience of an asset is not adequately retained.

30 Historic Environment Scotland (2016) (revised 2020). *Managing change in the Historic Environment: Setting*. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549 [Accessed January 2025]
31 The Chartered Institute for Archaeologists. (CIfA) (2014) (Revised 2017, 2019,2020, 2021 & 2022). *Code of Conduct; professional ethics in archaeology*. Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct.pdf [Accessed January 2025]
32 The Chartered Institute for Archaeologists. (CIfA) (2014) (Revised 2017, 2019,2020, 2021 & 2022). Code of Conduct; professional ethics in archaeology. Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct.pdf [Accessed January 2025]
33 The Chartered Institute for Archaeologists. (CIfA) (2014) (Updated 2020). *Standard and guidance for historic environment desk-based assessment*. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf [Accessed January 2025]
34 CIfA (2014) (Updated 2020). *Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment.* Available at: https://www.archaeologists.net/sites/default/files/CIfAS&GCommissioning_2.pdf [Accessed January 2025]
35 HES (2016) (Updated 2020), *Managing change in the Historic Environment: Setting*. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549 [Accessed January 2025]

5.3.7 In terms of effects upon the setting of heritage assets, it is considered that only those effects identified as 'significant' in EIA terms will have the potential to significantly adversely impact upon integrity of setting. Where no significant effect is found it is considered that there would be no significant impact upon the integrity of an asset's setting. Where significant effects are found, a detailed assessment of adverse impacts upon integrity of setting will be made. Whilst non-significant effects are unlikely to significantly impact integrity of setting, the reverse is not always true. That is, the assessment of an effect as being 'significant' in EIA terms does not necessarily mean that the adverse effect to the asset's setting will significantly impact its integrity. The assessment of adverse impact upon the integrity of an asset's setting, where required, is a qualitative one, and largely depends upon whether the impact predicted would result in a major impediment to the ability to understand or appreciate the heritage asset.

Study Area

5.3.8 In order to assess the potential for effects on cultural heritage assets resulting from the Proposed Development, the following Study Areas have been identified:

- A Core Study Area (the Site), which includes all land within the Site, which will be subject to assessment for potential direct and setting effects. This Study Area will be subject to a detailed walkover survey and cultural heritage assets which may be directly impacted by the Proposed Development will be identified, setting impacts will also be considered;
- A 1 km Study Area for the identification of all known heritage assets and known previous archaeological interventions in order to help predict whether any similar hitherto unknown archaeological remains are likely to survive within the Site and thus be impacted by the Proposed Development;
- A 5 km Study Area for the assessment of potential impacts on the settings of all designated heritage assets including Scheduled Monuments, Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields, Conservation Areas; and assets deemed to be of National Significance in the SMR;
- A 10 km Study Area for the assessment of potential impacts on the settings of all nationally important heritage assets including Scheduled Monuments, Category A Listed Buildings, Inventory GDL, Inventory Battlefields and non-designated assets deemed to be of National Significance in the SMR. There are no World Heritage Sites, Inventory Battlefields or Conservation Areas within 10 km of the Site.

5.3.9 Consideration has also been given to the potential for setting impacts upon assets beyond 10 km. This has been done using a ZTV based on the scoping layout (**Figure 5.2 (Appendix A)**). This exercise has considered that the potential for significant effects beyond 10 km is highly unlikely and as such, with the exception of the Scheduled Ronas Hill, chambered cairn (SM2043) it is not intended to consider assets beyond 10 km; reasoning for this is presented below in **Section 5.4: Likely Significant Effects.**

Baseline Characterisation

5.3.10 The archaeological and historical baseline will be established with reference to the following information sources:

- HES for designated heritage asset data;
- NRHE data for information on non-designated assets and previous archaeological events;
- SMR for information on non-designated assets and previous archaeological events;

- NLS for online old Ordnance Survey (1st and 2nd edition, small- and large-scale) and pre-Ordnance Survey historical maps;
- Shetland Museum and Archives for cartographic and archival materials related to the Site;
- BGS for bedrock and superficial deposit data and historic boreholes information;
- HLA maps (HES) for historic landscape characterisation and modern landscape information;
- The National Collection of Aerial Photography (NCAP (HES)) for accessible historic aerial photographs;
- Available client supplied data about the Site;
- Any other relevant published works, such as previous archaeological reports and assessments.

5.3.11 Following the completion of desk-based research, an archaeological walkover survey of the Site will be undertaken. The walkover survey will aim to identify previously unknown remains and establish the survival, extent, significance, and relationships of known heritage assets within the Site and the Study Areas. Weather conditions, ground cover, and any other conditions affecting the visibility during the survey will also be recorded. All heritage assets encountered will be photographed and recorded using the ArcGIS Field Maps app on a mobile device.

5.3.12 The walkover survey will also help to identify areas within the Site that may require further archaeological works and/or mitigation in advance of any future development.

5.3.13 Setting assessment visits to designated assets with the potential to be impacted by the Proposed Development will be undertaken. A ZTV will be used to initially identify designated heritage assets which require detailed assessment. A review of designated heritage assets outwith the ZTV will also be undertaken prior to site visits to identify any designated heritage assets with key views which would include the Proposed Development, and where appropriate these assets will also be subject to detailed setting assessment. Designated heritage assets outwith these criteria will be scoped out as they are unlikely to be significantly affected.

5.4 Likely Significant Effects

Potential Impacts Scoped In

Direct Impacts

5.4.1 Direct physical impacts to assets occur when the fabric of known or undiscovered assets is removed or damaged as a result of the Proposed Development. This will be permanent and generally occurs during the construction phase.

5.4.2 Indirect physical impacts occur as an indirect consequence of the development such as increased/decreased erosion or damage from vibration of piling. Such impacts are likely to be permanent.

5.4.3 Based on the presence of several known archaeological assets within the Site, there is the potential for direct impacts. Two designated heritage assets have been identified within the Site. Impacts upon the two prehistoric Scheduled Monuments (SM3576 - Asset 32 and SM3608 - Asset 35) will be avoided by design and thus no direct impact is expected. The cultural heritage assessment will outline appropriate measures to prevent any direct impact from inadvertent plant movement, which will include a demarcated area, and a toolbox talk included as part of the CEMP which will identify the location and provide safeguarding; particularly as any incursions into the Scheduled areas would require Scheduled Monument Consent.

5.4.4 Three non-designated heritage assets have been identified within the Site. The extent and survival of these non-designated assets identified within the Site is currently unknown and will require to be defined through detailed walkover survey and analysis of the SMR data. The results of these analyses will be used to inform the Proposed Development design and direct impacts will be avoided where possible. Where it is not possible to avoid direct impacts, the design will seek to minimise impacts and the cultural heritage assessment will outline appropriate mitigation measures to offset any impacts, via preservation by record, as required.

5.4.5 There is the potential for hitherto unknown archaeological and paleoenvironmental deposits and remains to survive on the Site. There is also a High potential for hitherto unrecorded archaeological remains to be present in the vicinity of the two prehistoric Scheduled Monuments (SM3576 - Asset 32 and SM3608 - Asset 35) and the settlement at Tronaster (Canmore ID 189728 - Asset 91). Based on the basis of the research undertaken to date, there is a Low potential throughout the rest of the Site. As such, the Proposed Development may have the potential to directly impact hitherto unknown archaeological remains. Due to the distance between the proposed turbines and the known heritage assets, the potential for direct impacts is unlikely to significantly constrain development. This potential will be taken into consideration when designing mitigation proposals to ensure that impacts are avoided or minimised or, where this is not possible, offset through a programme of archaeological works which would facilitate preservation by record. Any such works would be carried out in consultation with HES and with the Regional Archaeologist at SIC, as appropriate.

Setting Impacts

5.4.6 The Proposed Development has the potential to impact upon the settings of heritage assets with which it is intervisible or where it can be seen in key views towards assets across the landscape. There is also a potential for cumulative impacts on the settings of heritage assets. The assessment will consider the identified heritage assets in the outlined Study Areas which could be subject to potential impacts upon setting. The EIA Report will be supported by detailed ZTV mapping which will be used to identify assets intervisible with the Proposed Development. Visualisations (either wirelines or photomontages) will be produced for some assets to aid in the assessment of setting impacts.

5.4.7 Detailed consideration will be given to the potential for significant effects upon the setting of the Scheduled Monuments within the Site and also to those assets within the 10 km Study Area that fall within the ZTV and which have a high sensitivity to changes to their settings, in particular the prehistoric burial monuments. The Proposed Development will seek to minimise impacts through avoiding placing turbines in locations which would result in impacts upon the key characteristics of setting. Consideration will also be given to enhancement measures which could compensate for impacts upon the settings of assets if appropriate, any such measures would seek to enhance the understanding, appreciation and experience of the asset and maximise public benefit.

5.4.8 Visualisations for views to and from certain key assets will be produced following consultation with HES and the Shetland Regional Archaeologist. In particular, visualisation will be produced for the two prehistoric Scheduled Monuments (SM3576 - Asset 32 and SM3608 - Asset 35) and the Graven, chambered cairn 650m SW of (SM3524 - Asset 16) as a preliminary desk-based assessment has identified that these have the potential to be subject to significant setting effects during the operational phase of the Proposed Development as a result of their location within the Site boundary and the proximity to proposed turbines. These monuments are chambered cairns which will have been set on high ground to be visible from and have visibility across wide areas but in addition will have key views along the alignment of the chambers and are likely to have relationships to other cairns and natural features within the landscape. A full list of proposed visualisations is provided in **Table 5.1**.

5.4.9 A preliminary review of all other designated heritage assets within 10 km of the Site, identified that there is a potential for setting effects, although the level of effects, at worst, is not anticipated to be significant in EIA terms. However, these assets will be subject to detailed settings assessments, informed by ZTV analysis and site visits. Designated heritage assets outwith the ZTV and beyond 10 km will also be considered for assessment where appropriate and a review of their key views and characteristics will form part of the setting assessment.

5.4.10 In addition to the designated heritage assets located within the 10 km Study Area, it is proposed that a detailed setting assessment of the Scheduled Ronas Hill, chambered cairn (SM2043) be included within the EIA Report. The monument is located 11.89 km to the north east of the Site. The monument is a chambered cairn surviving to a height of about 3.5 m on the summit of Ronas Hill. The entrance is located to the east south east of the mound.

Table 5.1: Proposed Visualisation

Asset No	Listing No	Designation	Name	Visualisation
6	SM2080	Scheduled Monument	Fugla Ness, broch 330m NNW of	Wirelines
7	SM2091	Scheduled Monument	Holm of Copister, broch 850m SW of Southerness	Wirelines
16	SM3524	Scheduled Monument	Graven, chambered cairn 650m SW of	Photomontage
23	SM3564	Scheduled Monument	Hill of Dale, chambered cairn	Photomontage
32	SM3576	Scheduled Monument	Crooksetter Hill, chambered cairn at SE summit of	A photomontage is proposed from SM3576 and would cover views to the north and north west towards the turbines and would also include views towards the Crooksetter NW cairn (Asset 35—SM3608)
35	SM3608	Scheduled Monument	Crooksetter Hill, chambered cairn near NW summit of	A photomontage is proposed from SM3608 and would cover views to the north towards the turbines and would also include views towards the Crooksetter SE cairn (Asset 32—SM3576)
118	SM2043	Scheduled Monument	Ronas Hill, chambered cairn	Photomontage

Issues Scoped Out

5.4.11 Based on the baseline conditions, theoretical visibility and distance from the Site, it is proposed that the following are scoped out:

- physical impacts to assets outside the Site;
- impacts on the settings of non-designated cultural heritage assets and features, excepting those of potential national importance, will be scoped out of the assessment as these are

generally considered less sensitive to changes in their settings and are judged to be unlikely to be subject to significant settings effects; and

- designated heritage assets outwith the ZTV and not considered to have the potential for the Proposed Development to be seen in key views towards them across the landscape will be scoped out of the assessment.

5.4.12 Impacts on the settings of heritage assets beyond 10 km of the Site boundary, unless included under *Scoped In*, will be scoped out for the following reasons:

- AOC have reviewed the nationally important designated heritage assets within the Scoping ZTV to a distance of 40 km. Due to the topography, the ZTV indicates that visibility beyond 10 km is largely limited to the sea, with some visibility along the coasts and high points. The large majority of these assets are funerary monuments and initial assessment of these assets has identified that they are largely located on lower grounds near waterways and lochs. Funerary monuments in the ZTV beyond 10 km of the Site appear to relate to the fertile land and the waterways. Whilst the Proposed Development may be visible in views from some of these assets, it would not impact the relationship of these assets to the immediate landform in which they are set, the fertile land or to other possible contemporaneous assets. Thus, the Proposed Development is not anticipated to have a significant effect on their setting and they would be scoped out of further assessment; and
- The defensive monuments such as forts and brochs located beyond 10 km are largely located along the coast, which suggests they were placed to facilitate defence and communication along the coast and control the access inland. Whilst the Proposed Development is likely to be visible from some of these assets as a modern addition to the wider landscape and, in part, be visible from and between these assets, the Proposed Development would not impact intervisibility as it would be located further inland and thus not result in a significant effect upon the settings of these assets. As such these assets would be scoped out of further assessment.

Cumulative Effects

5.4.13 Cumulative effects will also be considered. The assessment of cumulative effects on heritage assets will be based upon consideration of the effects of the Proposed Development on the settings of heritage assets, in addition to the likely effects of other operational/under construction, consented and proposed (at the application stage) wind farm schemes. Cumulative effects will be considered for designated assets as identified in the 5 km and 10 km Study Areas. The assessment will take into account the relative scale (i.e size and number of turbines) of the identified developments, their distance from the affected assets, and the potential degree of visibility of the various developments from the assets. Cumulative wirelines from those assets most likely to experience significant cumulative impacts on their settings will be provided, if appropriate. The schemes to be included in the cumulative impact assessment will be those agreed with the planning authority via consultation and will be undertaken according to the guidance in NatureScot's Assessing the Cumulative Impact of Onshore Wind Energy Developments[3] and Historic Environment Scotland's Environmental Impact Assessment Handbook[6].

5.5 Questions to Consultees

Table 5.2: Questions to Consultees

Q5.1: Is the proposed assessment methodology, including proposed Study Areas, accepted?

Q5.2: Are the receptors and impacts scoped out of the assessment accepted?
Q5.3: Are there any assets beyond the proposed Study Areas that Consultees would like to see scoped into the assessment?
Q5.4: Do Consultees foresee any requirement for further visualisations?

6. ECOLOGY

6.1 Overview

6.1.1 This Section has been prepared by Alba Ecology Ltd, and considers the Proposed Development in respect to potential ecological receptors at the Site and in the Study Area. The scope of the ecological Section excludes birds, which are considered separately in **Section 7: Ornithology**.

6.1.2 This Section is supported by the following figures **(Appendix A)** and reports **(Appendix C)**:

- **Figure 6.1: Statutory Designated Sites**
- **Appendix C1: Natural Heritage Desk Study Report**;
- **Appendix C2: Habitat Survey Report**; and
- **Appendix C3: Protected Terrestrial Mammal Survey Report**.

6.1.3 This Section should be read in conjunction with other Sections particularly:

- **Section 7: Ornithology;** and
- **Section 8: Hydrology, hydrogeology, geology and soils**.

6.2 Baseline Conditions

Desk Study

6.2.1 A natural heritage desk study for the Proposed Development was undertaken using the relevant sources of data including NatureScot's SiteLink website[36], the local biodiversity records group (Shetland Biological Records Centre (SBRC)), the National Biodiversity Network (NBN) Atlas[37] and previous ecological surveys of the Site. All known records of important ecological receptors within a 2 km buffer of the Site were identified. All designated sites with ecological qualifying features within a 10 km buffer of the Site were identified.

6.2.2 As shown on **Figure 6.1**, a total of 11 statutory designated sites with biological features, within a 10 km radius of the Site, have been identified. These included two Special Protection Areas (SPAs), three Special Areas of Conservation (SAC), five Sites of Special Scientific Interest (SSSI) and a single Ramsar site. There is overlap between these designated sites (e.g. Ronas Hill (or parts of it) is a SPA, SAC, SSSI and Ramsar Site) and Yell Sound Coast SAC includes multiple sections of coastland. The closest statutory designated sites to the Site are Yell Sound Coast SAC and SSSI and Sullom Voe SAC.

6.2.3 There is a single Local Nature Conservation Site (LNCS) within the Study Area, Bordigarth LNCS, which is primarily designated for breeding Schedule 1 bird species[38]. The boundary of the LNCS, according to the Shetlands Local Development Plan Supplementary Guidance is in the south of the Study Area, however the boundary supplied by SBRC is larger and extends over much of the Site **(Appendix C1)**. SBRC also stated active blanket bog as a feature of Bordigarth LNCS.

6.2.4 According to Shetlands Local Development Plan Supplementary Guidance "*The purpose of LNCS is to highlight sites with important natural heritage to developers and the Council. In identifying LNCS the Council does not seek to prohibit development; they provide more information to ensure that development takes into account the important and sensitive features of these sites. However, there*

36 NatureScot (n.d). Site *Link Map.* Available at: SiteLink - Map Search [Accessed January 2025]
37 NBN (n.d). NBN Atlas. Available at: NBN Atlas - UK's largest collection of biodiversity information [Accessed January 2025]
38 Shetland Islands Council (2014). *Shetland Local Development Plan*. Available at: local-nature-conservation-site-supplementary-guidance [Accessed January 2025]

may be occasions where development would be considered inappropriate and would not be permitted."

6.2.5 A published explanation for the apparent discrepancy between the description and boundary of the Bordigarth LNCS provided by SIC and NatureScot and that provided by SBRC were unable to be found. Although SBRC state "*the original boundaries were provisional, and when we undertook a review of them for the council a few years ago, some of them were increased or reduced to reflect the key site interests*" (SBRC, pers comm.).

6.2.6 Records of species from the SBRG and NBN, within the 2 km Study Area, were compiled and presented in **Appendix C1**, including identification of those that are on the Scottish Biodiversity List (SBL).

6.2.7 Historic habitat data was searched for. There were no records of ancient woodland within the Search Area. There was very limited historic habitat data found.

6.2.8 The Carbon and Peatland 2016 Map[39] predicts that much of the Study Area is Class 1 peatlands, with other areas mostly predicted to be Class 4 or Class 5 (**Figure 8.5**). Class 1 peatland is defined as "nationally important carbon-rich soils, deep peat and priority peatland habitat and areas likely to be of high conservation value". It should be noted that the Carbon and Peatland Map is a high-level predictive planning tool which provides an indication of the likely presence of peat on each individually mapped area, at a coarse scale. The map is not a definitive account of where important carbon rich soils, deep peat and priority peatland habitat exist.

6.2.9 The full natural heritage desk study, including methods, results and limitations can be found in **Appendix C1**.

Habitat surveys

6.2.10 A series of habitat surveys were undertaken in July 2022 and included a Phase 1 Habitat Survey, a National Vegetation Classification (NVC) survey and an assessment of potential groundwater dependent terrestrial ecosystems (GWDTE). As much of the habitat was peatland, a Peatland Condition Assessment (PCA) was also undertaken as part of the survey.

6.2.11 The Study Area was characterised by blanket bog and dry modified bog. Less frequently recorded habitats included dry heath, wet heath, acid grassland, coastal grassland and marshy grassland. There were multiple flushes across the Study Area. These habitats and vegetation community types are typical for Shetland.

6.2.12 The condition of the blanket bog was described using standard PCA terminology. The condition of the peatland habitat was very variable across the Study Area, and was on a continuum from very wet, high quality blanket bog in Near-Natural condition to Modified and Drained bog. There were widespread degraded areas that were Actively Eroding.

6.2.13 Some of the habitats in the Study Area were defined as wetland habitat and potential GWDTE. The NVC flush communities are considered to be potentially highly groundwater dependent.

6.2.14 The full habitat survey report, including methods, results and limitations can be found in **Appendix C2**.

Protected terrestrial mammal surveys

6.2.15 Protected mammal surveys were undertaken in the Study Area to assess the likelihood of the presence of otter (*Lutra lutra*) and mountain hare (*Lepus timidus*) in 2023-2024.

39 Scotland's Soils Carbon and Peatland 2016 Map. Map Legend. Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ [Accessed January 2025]

6.2.16 Evidence was recorded across the Study Area of use by otters. Some areas were noted as being more heavily used and more important than others. With an active holt recorded at the western coastal edge of the Site. This would suggest that part of the Study Area is regularly used by otter.

6.2.17 Mountain hares were recorded regularly across the Study Area, with two areas where higher incidence and activity levels were recorded. These areas were at the northern extent of the Site and in a central area, around 200-300 m north of Sand Water, where a large amount of breeding behaviour was observed.

6.2.18 The full protected terrestrial mammal report, including methods, results and limitations can be found in **Appendix C3**.

6.3 Assessment Scope and Methodology

Key Terms of Reference

6.3.1 This Section provides a brief summary of the key terms of reference and criteria that will be used to evaluate the significance of predicted likely effects on important ecological receptors due to the construction and operation of the Proposed Development.

6.3.2 The ecological assessment approach is in accordance with best practice guidance. For the avoidance of doubt, Chartered Institute of Ecology and Environmental Management (CIEEM)[40] and NatureScot best practice guidance has been/will be followed in relation to surveys and the assessment.

6.3.3 The ecological receptors identified in the baseline studies will be evaluated following best practice guidelines[40]. Identifying the importance of potential ecological receptors will be the first step of the process, and those considered potentially important and present will then be then subject to detailed survey and assessment. Those considered sufficiently widespread, unthreatened and resilient to the project impacts would be scoped out of further assessment as per best practice Ecological Impact Assessment (EcIA) guidance[40]. Importance is in relation to a wide number of ecological attributes (such as rarity etc). Guidance on EcIA also sets out categories of ecological or nature conservation importance that relate to a geographical framework (e.g., international through to local) together with criteria and examples of how to place a site or study area (defined by its ecological attributes) into these categories.

6.3.4 Once the importance of an ecological receptor has been determined, the potential impacts on that receptor are considered in terms of magnitude, extent, duration, frequency and timing, reversibility, sensitivity and whether the impact would likely be positive, negative or neutral. These terms are clearly explained in EcIA guidance[40].

Requirements for Mitigation

6.3.5 There is now clear policy and guidance that development plans should not just try to avoid causing likely significant effects but aim to provide biodiversity enhancement (e.g., NPF4). Best practice EcIA guidance[40] and NPF4[5] recommends seeking to provide overall benefits for important biodiversity over and above design requirements for avoidance, minimisation or compensation.

6.3.6 In line with NPF4 and best practice guidance, best practice measures would be undertaken to further avoid or minimise potential impacts on ecological receptors. As such, mitigation will be embedded within the project design.

6.3.7 Examples of embedded mitigation will include:

40 CIEEM (2018). *Guidelines for ecological impact assessment in the United Kingdom and Ireland*. Version1.1. Updated September 2019.

- taking into consideration locations of sensitive/important habitats such as high-quality areas of peatland and GWDTE;
- taking into consideration locations of importance to protected terrestrial mammals, such as holts; and
- Mammal friendly designs of e.g. watercourse crossings and fencing.

Compensation

6.3.8 NatureScot advises in their priority peatland guidance[41] that there should be compensation measures for impacts on peatland habitat in the order of 1:10 (loss: restoration). Suitable peatland restoration areas have been identified within the Study Area **(Appendix C2)** and compensation measures will be addressed in the EcIA and Outline Biodiversity Enhancement and Habitat Management Plan (OBEHMP).

Opportunities for Biodiversity Enhancement

6.3.9 Based on the habitat surveys there appears to be potential for ecological enhancements opportunities across the Study Area which, where appropriate, will form part of an OBEHMP. The biodiversity enhancement opportunities likely include:

- **Peatland restoration**: There is a great deal of potential for peatland restoration within the Study Area, particularly in the form of drainage ditch blocking and restoration of areas that were in an Actively Eroding condition. Blocking the drainage ditches and blocking and reprofiling erosion features would help to re-wet the peatland habitat and help to establish a more natural drainage pattern. This would benefit not only the vegetation but the numerous species that depend upon it such as invertebrates and wading birds. Peatland restoration will be explored as part of OBEHMP.
- **Grazing management**: The management of grazing animals would likely greatly benefit the habitat within the Study Area and allow for the any peatland restoration to be successful. Evidence from across the Study Area suggests high levels of grazing sheep. Measures or mechanisms to manage the sheep population, to allow for effective peatland restoration will be explored as part of OBEHMP.
- **Creating and strengthening nature networks through riparian planting:** Riparian woodlands play a hugely important role in helping to maintain the health and productivity of rivers and burns and well as being corridors for wildlife. In particular, they can stabilise banks and the shade they provide may help to provide lower water temperatures, a damaging feature of predicted climate change. Creating riparian woodland/scrub along suitable watercourses would not only support and stabilise the watercourse, but could also potentially create a connecting woodland. This sort of 'nature network' supports the free movement of species and genes and is strongly supported in polices such as NPF4. The creation of riparian woodland or scrub will be explored as part of OBEHMP.
- **Pools, ponds and lochan creation:** There are a large number of pools and lochans within the Study Area. Ponds and lochans provide wildlife opportunities for a variety of aquatic species such as amphibians and they can also provide a source of food for other species such as birds with precocial wader chicks often favouring their edges in open habitats. Lochans and pools can also be important for breeding birds. The habitat survey identified the likely loss of

41 NatureScot (2023). *Advising on peatland, carbon-rich soils and priority peatland habitats in development management.* Available at: Advising on peatland, carbon-rich soils and priority peatland habitats in development management | NatureScot [Accessed January 2025]

some surface water pools. Creating additional pools and lochans and protecting any on the verge of being lost would undoubtedly increase nature networks and enhance the ecological value of the Study Area.

Study Area

6.3.10 The elements of the Proposed Development described in Paragraph 2.3.2 are contained within the Site and form the Development Footprint. The 'zone of influence' for a project is the area over which ecological receptors may be affected by biophysical changes as a result of the Proposed Development and associated activities[40]. The zone of influence will vary for different ecological receptors depending on their sensitivity to, and the nature of, an environmental change. The zone of influence can extend beyond the Site and the Study Area, particularly in the context of hydrological connectivity and potential pollution events. However, the Study Area for each receptor is considered an appropriate zone of influence for the vast majority of ecological receptors.

6.3.11 A 250 m buffer is usually required around all proposed development infrastructure (with >1 m evacuation) to comply with SEPA guidance[42]. Therefore, for the purposes of the habitat surveys, the Study Area included the Site plus a 250 m buffer except where there were clear areas that could not be surveyed (e.g. Sullom Voe Terminal) or where clear boundaries existed (such as roads, watercourses and the sea).

6.3.12 The Study Area for the protected terrestrial mammal survey included the Site plus a 200 m buffer.

6.3.13 Further detail on the Study Areas are presented in **Appendix C1 – C3.**

Baseline Characterisation

6.3.14 Baseline ecological conditions have been established using the following desk-based sources:

- NatureScot's SiteLink website[36];
- local biodiversity records group (SBRC); and
- NBN Atlas[37].

6.3.15 As described in **Section 6.2: Baseline Conditions**, the ecological survey work for the Proposed Development to date has include the following:

- habitat surveys; and
- protected terrestrial mammal surveys.

6.3.16 Ecological survey work still to be undertaken includes the following:

- Vegetation survey of the development footprint.

6.3.17 Given much of the site is on peatland habitats an assessment of turbine locations and other relevant infrastructure locations will provide a more detailed, localised consideration of the vegetation along the Proposed Development footprint. It will provide information for siting turbines and will inform NatureScot in relation to their new guidance on peatland habitats[41]. A standard methodology for this type of approach has not yet been developed. However, this survey work draws upon various

42 SEPA (2017). *Land-Use Planning System SEPA Guidance Note 4: Planning Guidance on Wind Farm Developments*. LUPG-GU4 Issue No'9.

published information and guidance[43,44,45,46,47,48] and uses well established vegetation assessment techniques, namely quadrats and transects.

6.4 Likely Significant Effects

Potential Impacts Scoped In

6.4.1 The main construction and operational elements of the Proposed Development which are likely to have the potential to impact ecological receptors will be assessed. For further details of the Proposed Development refer to **Section 2: Description of the Proposed Development**. A summary of the potential construction and operational impacts on ecology are outlined in **Table 6.1** and **Table 6.2**. Potential impacts in these tables do not imply that they would occur, or that any resultant effects would be significant.

Table 6.1: Summary of Potential Construction Impacts on Ecological Receptors

Term	Potential Construction Impacts
Mobile plant operations and traffic	Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Mortality.
Tracks and watercourse crossings including cut/fill works	Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Changes in hydrology and chemistry leading to vegetation changes. Mortality.
Cable laying including cut/fill works	Direct habitat loss. Temporary noise. Vibration, movement, vegetation disturbance and habitat fragmentation. Pollution and sediment release into watercourses. Introduction of drainage lines leading to habitat change.
Turbine foundations, Construction compounds and laydown areas including cut/fill works, borrow pits	Direct habitat loss. Temporary habitat loss, disturbance and fragmentation caused by overlaying vegetation. Pollution and sediment release into watercourses. Mortality.
Implementation of biodiversity enhancement measures	Creation and strengthening of landscape-scale nature networks. Peatland restoration. Reduced grazing pressure. Targeted species action. Ecosystem resilience.

Table 6.2: Summary of Potential Operational Impacts on Ecological Receptors

Term	Potential Operational Impacts
Turbines in operation	Noise and movement resulting in potential disturbance or mortality.
Foundations	Impacts on hydrology resulting in changes to vegetation.

43 Lindsay, R (1995). Bogs: The Ecology, Classification and Conservation of Ombrotrophic Mires.
44 Linsday, R. Birnie, R and Clough, J (2014). IUCN UK Committee Peatland Programme Briefing Note No.1 Peat Bog Ecosystems: Key Definitions. IUCN UK Peatland Programme.
45 Linsday, R. Birnie, R and Clough, J (2014). IUCN UK Committee Peatland Programme Briefing Note No.2 Peat Bog Ecosystems: Structure, Form, State and Condition. IUCN UK Peatland Programme.
46 Linsday, R. Birnie, R and Clough, J (2014). IUCN UK Committee Peatland Programme Briefing Note No.7 Grazing and Trampling. IUCN UK Peatland Programme.
47 Glenk, K., Martin-Ortega, J., Byg, A. (2017). *Online Condition Assessment Support Tool*. Peatland Action, Scottish Natural Heritage.
48 SNH (2016). *Peatland Condition Assessment Guide.*

Term	Potential Operational Impacts
Tracks	Loss of habitat from construction throughout operation, severance and fragmentation of both terrestrial and aquatic habitats. Impacts on hydrology and chemistry along track edges resulting in changes to vegetation. Sediment release into watercourses. Mortality from service vehicles.
Recreation i.e. recreational use of tracks	Increased disturbance and associated effects through noise and trampling etc. e.g. motorbikes, walking, dogs and litter.
Implementation of biodiversity enhancement measures	Creation and strengthening of landscape-scale nature networks. Peatland restoration. Reduced grazing pressure. Targeted species action. Ecosystem resilience.

Issues Scoped Out

6.4.2 Ecological impacts arising from the process of decommissioning would be scoped out of the assessment. An assessment of the ecological impacts of decommissioning the Proposed Development would not be undertaken as part of the EIA because:

(i) the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage;

(ii) the proposals for decommissioning are not known at this stage, and

(iii) the best practice decommissioning guidance methods would likely change during the lifetime of the Proposed Development and so cannot be predicted at this stage.

6.4.3 The EIA Regulations require all "*likely significant effects*" (positive and negative) to be considered. This is usually taken to mean site specific related effects, although this is not as straightforward as it first appears to be. For example, the benefits to ecological receptors within the Study Area stemming from the contribution made by the Proposed Development towards countering climate change through renewable energy generation cannot yet be quantified at a local scale. Nevertheless, it is clear that a wind farm proposal of the size of the Proposed Development would make a beneficial contribution to meeting national CO_2 emission targets as well as reducing actual CO_2 emissions, helping to combat climate change, a significant threat to habitats and species globally. Uncertainties regarding climate change predictions mean that it is not possible at present to carry out a quantitative assessment of the beneficial impacts of wind farms to habitats and species. Therefore, these will be scoped out of further consideration within the EIAR.

6.4.4 Baseline data for freshwater macro-invertebrate is generally used for monitoring water quality and establishing baseline conditions. Should consent be granted for the Proposed Development then baseline aquatic monitoring will be established following standardised methodologies. Macro-invertebrates will therefore not be subject to further consideration within the EIAR, except in relation to pre-construction baseline survey requirements.

Cumulative Effects

6.4.5 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. There is no published NatureScot guidance for cumulative impact assessment on most ecological receptors. NatureScot guidance on cumulative impact assessment of onshore wind farms is confined to landscape and birds. The key principle of NatureScot's cumulative impact assessment guidance for birds is to focus on any significant effects and in particular those that are likely to influence the outcome of the consenting process. Therefore, it follows that cumulative ecological impact should be considered on any impacts with likely significant effects.

6.5 Questions to Consultees

Table 6.3: Questions to Consultees

Q6.1: Can the consultees provide any clarification on the apparent discrepancy between the description and boundary of the Bordigarth LNCS provided by SIC and NatureScot and that provided by SBRC?
Q6.2: Are the consultees content with the scope and nature of the ecological baseline surveys?
Q6.3: Are the consultees content to scope out macro-invertebrate surveys other than the requirement for to pre-construction baseline survey?
Q6.4: Are the consultees content with the scope and nature of the proposed biodiversity enhancement?

7. ORNITHOLOGY

7.1 Overview

7.1.1 This Section has been prepared by Alba Ecology Ltd, and considers the Proposed Development in respect to potential ornithological receptors at the Site and in the associated Study Area. The Section excludes non-avian ecology issues, which are considered separately in **Section 6: Ecology**.

7.1.2 This Section is supported by the following figures **(Appendix A)** and report **(Appendix C)**:

- **Figure 6.1: Statutory Designated Sites;**
- **Figure 7.1: Vantage Points and Viewsheds;** and
- **Appendix C1: Natural Heritage Desk Study Report**.

7.1.3 This Ornithological Scoping Report should also be read in conjunction with other Sections, particularly **Section 6: Ecology**, where a description of the habitats present within the Site is summarised.

7.2 Baseline Conditions

7.2.1 A natural heritage desk study for the Proposed Development was undertaken using the relevant sources of data including NatureScot's SiteLink website[36], the local biodiversity records group (SBRC) and the NBN Atlas[37]. All known records of important ornithological receptors within a 2 km buffer of the Site and all designated sites with ornithological qualifying features within a 10 km buffer of the Site were identified **(Appendix C1)**.

7.2.2 As shown on **Figure 6.1**, the following designated sites (with ornithological qualifying features) are located within 10km of the Site:

- Ronas Hill – North Roe and Tingon SPA;
- Otterswick and Graveland SPA;
- Ronas Hill – North Roe SSSI; and
- Otterswick SSSI.

7.2.3 As identified in **Paragraph 6.2.3** there is a single LNCS within the Study Area, Bordigarth LNCS, which is primarily designated for breeding Schedule 1 bird species[38].

7.2.4 Based on an initial desk study and site walkover, the following potentially important ornithological receptors were identified for survey:

- red-throated diver (*Gavia stellata)*;
- merlin (*Falco columbarius*);
- whimbrel (*Numenius phaeopus*);
- curlew (*Numenius spp.*);
- dunlin (*Calidris alpina*);
- redshank (*Tringa tetanus*);
- golden plover (*Pluvialis apricaria*);
- snipe (*Gallinago gallinago*);
- lapwing (*Vanellinae spp.*);
- oystercatcher (*Haematopus spp.*);
- Arctic skua (*Stercorarius parasiticus*)
- Great skua (*Stercorarius skua*);
- Arctic tern (*Sterna paradisaea*); and
- Gulls (*Larus spp.*).

7.2.5 In light of these species and best practice survey guidance, the following surveys were conducted during 2022-2024.

- breeding bird surveys;
- breeding raptor surveys;
- targeted waterbody surveys; and
- vantage point watches.

7.2.6 All Schedule 1 species recorded as breeding or making breeding attempts within the Study Area are treated as confidential and therefore their breeding data will be presented separately in a confidential Technical Appendix to the EIAR, in accordance with NatureScot best practice guidance on handling sensitive data. All Schedule 1 breeding bird records have been supplied directly to NatureScot in accordance with Schedule 1 licensing conditions.

7.2.7 Vantage Point (VP) watches were undertaken between April and September 2022 and 2023. Of the 22 target species recorded during the 2022 VP watches, 14 had a moderate to high level of flight activity which would be considered sufficient for a Collision Risk Assessment (CRA) to be undertaken: red-throated diver, greylag goose, curlew, golden plover, oystercatcher, redshank, snipe, whimbrel, common gull, greater black-backed gull, herring gull, Arctic tern, Arctic skua and great skua.

7.2.8 Of the target species recorded during the 2023 VP watches, 12 species had moderate to high levels of flight activity which would be considered sufficient for CRA to be undertaken: red-throated diver, greylag goose, curlew, golden plover, lapwing, oystercatcher, redshank, snipe, whimbrel, Arctic tern, Arctic skua and great skua. This is a similar list of species to those recorded in 2022, with only the addition of lapwing.

7.3 Assessment Scope and Methodology

Key Terms of Reference

7.3.1 The ornithological assessment would be undertaken in accordance with best practice guidance. For the avoidance of doubt, CIEEM[40] and NatureScot best practice guidance has been/will be followed in undertaking the surveys and assessment. Use of important EIA terms such as, sensitivity of receptor, magnitude of impact and likely significance of effect, will follow CIEEM best practice guidance, unless otherwise stated and is not repeated here for brevity.

Opportunities for Enhancement

7.3.2 There is now clear policy and guidance that development plans should not just try to avoid causing likely significant effects but aim to provide biodiversity enhancement (e.g. NPF4). Best practice EcIA guidance[40] and NPF4 recommend seeking to provide overall benefits for important biodiversity over and above design requirements for avoidance, minimisation or compensation. A combined biodiversity enhancement report for important ecological and ornithological receptors will be provided as part of the EIAR.

Study Area

7.3.3 The elements of the Proposed Development described in **Paragraph 2.2.2** are contained within the Site and form the Development Footprint. The 'zone of influence' for a project is the area over which ornithological receptors may be affected by changes as a result of the Proposed Development and associated activities[40]. The zone of influence will vary for different ornithological receptors

depending on their sensitivity to, and the nature of, a predicted environmental change. The zone of influence can extend beyond the Site and the Study Area.

7.3.4 The ornithological Study Area includes all the land within the Site plus an appropriate survey buffer (which varies dependant on bird species and best practice survey guidance). The NatureScot survey guidance[49] directs efforts for matching field survey requirements to the project information needs: *'Effort in assessing impacts, and hence the target bird species for field survey,* should *be focussed on those species for which there is potential for an impact which might be judged significant and adverse. In most circumstances the target species should be limited to those protected species and other species of conservation concern which, as a result of their flight patterns or response behaviour, are likely to be subject to impact from wind farms'.*

7.3.5 The following study areas were applied during ornithological surveys:

- moorland/upland breeding bird survey: Site plus a 500 m buffer;
- breeding raptor survey: Site plus a 2 km buffer; and
- targeted waterbody surveys: Site plus a 1 km buffer.

7.3.6 VPs were selected to cover the majority of the potential turbine area (including the estimated outer sweep of turbine blades) plus a 500 m buffer, aiming at a maximum viewing distance (viewshed) of 2 km without observers sitting within the Proposed Development boundary. The five VPs selected and undertaken have very good close coverage for most of the Proposed Development boundary **(Figure 7.1)**.

Baseline Characterisation

Desk Based

7.3.7 Baseline ornithology conditions have been/will be established using desk-based sources, including:

- NatureScot's SiteLink website[36];
- local biodiversity records group (SBRC); and
- NBN Atlas[37].

Field Surveys

7.3.8 As discussed in **Section 7.2: Baseline Conditions**, breeding bird surveys and VP watches have been undertaken for the Proposed Development between 2022 and 2024. The scope of the surveys is detailed below:

- moorland/upland breeding bird surveys: encompassing 3 breeding seasons and in accordance with the methodology set out in Brown and Shepherd (1993)[50];
- breeding raptor surveys: encompassing 3 breeding seasons and in accordance with the methodology set out in Hardey et al (2013)[51];
- targeted waterbody surveys: encompassing 3 breeding seasons and in accordance with NatureScot guidance[49]; and

49 SNH (2017). *Recommended bird survey methods to inform impact assessment of onshore windfarms.* Available at: Recommended bird survey methods to inform impact assessment of onshore windfarms | NatureScot [Accessed January 2025].
50 Brown and Shepherd (1993). A Method for Censusing Upland Breeding Waders. Available at: https://cieem.net/resource/a-method-for-censusing-upland-breeding-waders/ [Accessed January 2025]
51 Hardey, Crick, Wernham, Riley, Etheridge and Thompson (2013). *Raptors: A field Guide for Surveys and Monitoring*. Available at: https://www.nhbs.com/raptors-a-field-guide-for-surveys-and-monitoring-book [Accessed January 2025]

- VP watches: over a two-year period and in accordance with NatureScot guidance [49].

7.3.9 The breeding bird surveys encompassed three breeding seasons, rather than the typical recommended two as the period of survey coincide with the 2022 birdflu (H5N1) outbreak, which resulted in the death of tens of thousands of birds, including many in Shetland. As consequence, it was considered necessary to have an additional season of breeding bird data (in 2024) to see if the outbreak noticeably resulted in a change to the ornithological baseline conditions.

7.4 Likely Significant Effects

Potential Impacts Scoped In

7.4.1 Potential direct and indirect effects on ornithological receptors will be assessed. According to NatureScot[52] onshore windfarms may have the following potential effects on birds, mainly:

- displacement – birds may partially or totally avoid a wind farm and hence be displaced from the underlying habitat;
- barrier effects – birds may use more circuitous routes to fly between, for example, breeding and foraging grounds, and thus use up more energy to acquire food;
- habitat effects – birds may be attracted or displaced by changes in habitats and prey abundance because of the wind farm; and
- collision risk – birds may be injured or killed by an encounter or collision with turbines or rotor blades.

7.4.2 Potential effects can occur on ornithological receptors from designated sites and also on so-called 'wider countryside birds'; both will be considered.

Construction

7.4.3 Examples of direct effects on ornithological receptors during the construction phase of the lifetime of the Proposed Development can include impacts through collisions with plant or destruction of nests during construction. Examples of potential indirect effects include destruction of habitat and breeding bird disturbance during the construction process.

Operation

7.4.4 Examples of direct effects include collision with rotating turbines while examples of potentially indirect effects include avoidance of foraging/nesting habitat due to turbine operation.

Issues Scoped Out

7.4.5 Ornithological impacts arising from the process of decommissioning will be scoped out of this assessment. An assessment of the ornithological impacts of decommissioning the Proposed Development will not be undertaken as part of the EIAR because:

(i) the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage for 40 years' time;

(ii) the proposals for decommissioning are not known at this stage, and

(iii) the best practice decommissioning guidance methods will likely change during the lifetime of the Proposed Development and so cannot be predicted at this stage. Nevertheless, the

52 NatureScot (2024). *Wind farm impacts on birds.* Available at: Wind farm impacts on birds | NatureScot [Accessed February 2025].

Applicant will commit to consulting with the statutory authorities at least one year ahead of decommissioning and to implement best practice methodologies, whatever they be, at the time of decommissioning in approximately 40 years.

7.4.6 The EIA regulations require all *'likely significant effects'* (beneficial and adverse) to be considered. This is usually taken to mean Site specific related effects, although this is not as straightforward as it first appears to be. For example, the benefits to ornithological receptors within the Study Area stemming from the contribution made by the Proposed Development towards countering climate change through renewable energy generation cannot yet be quantified at a local scale. Nevertheless, it is clear that a wind farm proposal of the size of the Proposed Development would make a beneficial contribution to meeting national CO_2 emission targets as well as reducing actual CO_2 emissions, helping to combat climate change, a significant threat to bird species globally. Uncertainties regarding climate change predictions mean that it is not possible at present to carry out a quantitative assessment of the beneficial impacts of wind farms to habitats and species. Therefore, although recognised, these will be scoped out of further consideration within the EIAR.

Cumulative Effects

7.4.7 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can be important as ornithological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause irreversible declines. Cumulative effects can also make habitats and species more vulnerable or sensitive to change. Once residual effects are assessed, potential cumulative effects will be assessed.

7.5 Questions to Consultees

Table 7.1: Questions to Consultees

Q7.1: Are the consultees content with the nature and the scope of ornithological surveys?
Q7.2: Are the consultees content with how the matters identified are scoped out?

8. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

8.1 Overview

8.1.1 This Section outlines the preliminary hydrology, hydrogeology, geology and soils baseline applicable to the Site. An overview of potential impacts to be addressed within the EIAR and the proposed method for evaluation of effects is also provided.

8.1.2 The scope of the assessment is based on a high-level review of baseline information and findings which will be confirmed through a review of additional data sources, site visits, and consultation with appropriate stakeholders.

8.1.3 This Section is supported by the following figures **(Appendix A)**:

- **Figure 8.1: Surface Water Features;**
- **Figure 8.2: Flood Risk;**
- **Figure 8.3: Superficial Geology;**
- **Figure 8.4: Solid Geology;** and
- **Figure 8.5: Carbon and Peatland Map.**

8.2 Baseline Conditions

Hydrology and Hydrogeology

8.2.1 The Site is located within the Shetland Coastal Catchment. The Site comprises an undulating plateau that ranges in elevation from mean high-water level at its northernmost extent by Ay Wick, to 116 m AOD at the Hill of Crooksetter located in the centre of the Site. The northern extent of the Site primarily drains into the Aywick Burn flowing in a north-westerly direction and the Burn of Toft flowing eastwards. A small section of Burn of Crooksetter and its tributaries are located in the west of the Site. A section of Neshion Water is located in the east of the Site. The Site is bounded by Yell Sound (coastal waterbody) (SEPA ID: 200503) in the north west.

8.2.2 Towards the southern end of the Site the topography gently undulates between 20 m AOD and 90 m AOD. The slackness of slopes in this part of the Site is associated with a number of lochans including Sand Water, Nugla Water and the Loch of Bordigarth and their connecting watercourses. Tributaries from the Burn of Laxobigging are also located in the south of the Site. This is shown in **Figure 8.1 (Appendix A)**.

8.2.3 SEPA Flood Risk maps[53] identify the majority of land within the Site to be assessed as having a Very Low risk of flooding from rivers, sea and surface water (less than 1 in 1,000 (0.1 %) annual probability). The watered areas of a number of Lochans located within the south of the Site have been identified at risk of either fluvial flood risk (specifically the Neshion Water and the Sand Water) or surface water flood risk (specifically Nugla Water and Loch of Bordigarth). A number of very small areas within the Site have been identified to be at a Low to High risk of surface water flooding; however, the flooding is localised in nature and does not indicate a wider risk of flooding in the area. This is shown in **Figure 8.2 (Appendix A)**.

8.2.4 According to BGS 1:625,000 hydrogeological mapping[54], the Site is underlain by aquifers which are classified by the BGS as low in productivity (Class 2C), with small amounts of groundwater potential near surface weathered zones and secondary fractures. The Site is not identified to be located within

53 SEPA Flood Risk Map. Available at: https://map.sepa.org.uk/floodmap/map.htm [Accessed January 2025].
54 BGS Hydrological Mapping. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.143684597.1753797597.1701875658-1220107499.1701875658 [Accessed January 2025]

a designated Scottish Water Surface Water Drinking Water Protected Area (DWPA). The presence or absence of private Water Supplies (PWS) within the proposed study area will be confirmed through consultation with SIC and landowners, and site inspection.

8.2.5 There is the potential that areas of the Site may be classified as potentially GWDTEs. Hydrological and hydrogeological assessment will be carried out to determine the actual likelihood of groundwater dependency and the sensitivity of such habitats, based on findings of the ecological surveying to classify NVC vegetation communities across the ecological study area.

Geology and Soils

8.2.6 According to the BGS's Geology Map Viewer[26], the superficial geology underlying the Site is predominantly comprised of peat. Peat is a partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps. There are small areas of glacial (diamicton) deposits and till, as well as small areas with no mapped superficial deposits. This is shown in **Figure 8.3 (Appendix A).**

8.2.7 The underlying bedrock across the Site is predominantly Graven Complex Granodiorite. Granodiorite is a coarse-grained (phaneritic) intrusive igneous rock. The underlying bedrock located in the northern part of the Site comprises Yell Sound Psammite Formation (psammite and pelite). This comprises psammite, variably gneissose; with subsidiary layers or lenses of amphibolite, pelite, quartzite and gneissose semipelite. This in turn is likely overlying Lewisian Gneiss (L), with sheared unconformity, and overlain by the Mid-Yell psammite formation. A small portion of the Site comprises Yell Sound Psammite Formation (psammite, gneissose) metamorphic bedrock, as the psammite is variably gneissose; with subsidiary layers or lenses of amphibolite, pelite, quartzite and gneissose semipelite. A vein of North Britain Siluro-Devonian Calc-alkaline Dyke Suite Quartz is located in the centre of the site. This is shown in **Figure 8.4 (Appendix A)**.

8.2.8 A review of the Carbon and Peatland 2016 map[39] confirms that the Site is predominantly overlain by Class 1 Peat comprising blanket bog/peat. Class 1 Peat is defined as '*nationally important carbon-rich soils, deep peat and priority peatland habitat', and 'likely to be of high conservation value'*. There are small areas of the Site that are classified as Class 4 and Class 5 Peat. Class 4 Peat is defined as '*predominantly mineral soil with some peat soil and heath with some peatland*'…'*This area is unlikely to be associated with peatland habitats or wet and acidic types and is unlikely to include carbon-rich soils'*. Class 5 Peat is defined as 'peat soil' that is absent of peatland vegetation. There is no recorded peatland habitat, and the area may include areas of bare soils which are carbon-rich and comprise deep peat[39]. This is shown in **Figure 8.5 (Appendix A)**.

8.2.9 The Scotland's Environment Map[55] online viewer does not identify any nationally or locally important environmental designations for peat or geological conservation locations in proximity to the Site.

8.2.10 A review of aerial imagery[56] and online historical maps indicate that there are no previous contaminative land uses at the Site, and no sources of infilling such as former quarries have been identified. A PCA was undertaken in 2024 and found the Site predominantly comprised modified peat, with small pockets of near natural peat and actively eroding peat across the Site. Non-blanket bog habitat was also mapped in small pockets across the Site with a larger area to the north east.

55 SEPA (n.d). *Scotland's Environment Map.* Available at: https://www.environment.gov.scot/about-us/who-are-we/ [Accessed January 2025].
56 Google, 2025. Google Earth. Available at: https://earth.google.com/web/@51.13214917,-1.67830945,106.46210804a,2289.36496629d,35y,0h,0t,0r/data=CgRCAggBQgIIAEoNCP wEQAA [Accessed January 2025]

8.3 Assessment Scope and Methodology

Key Terms of Reference

Hydrology and Hydrogeology

8.3.1 Regarding the significance of hydrological and hydrogeological impacts, assessment will be undertaken through determining the sensitivity and susceptibility of specific attributes and the magnitude of the impact upon the attribute. Impacts will be assessed considering the inclusion of construction, operation and decommissioning within the Proposed Development and the potential for cumulative effects.

8.3.2 The assessment will take into account applicable planning guidance including, but not limited to:

- Technical Flood Risk Guidance for Stakeholders[57];
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 - A Practical Guide[58];
- WAT-PS-06-02: Culverting of Watercourses - Position Statement and Supporting Guidance[59]
- WAT-SG-25: Engineering in the Water Environment Good Practice Guide – River Crossings[60];
- Land Use Planning System SEPA Guidance Note 4 Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems[61];
- Land Use Planning System SEPA Guidance Note 4: Planning guidance on on-shore windfarm developments[42];
- Flood Risk and Land Use Vulnerability Guidance[62]; and
- Climate change allowances for flood risk assessment in land use planning, Land Use Planning System SEPA Guidance[63].

Geology and Soils

8.3.3 The assessment of the significance of geology and soils impacts will be undertaken by determining the sensitivity of the specific attribute and the magnitude of the impact upon the attribute. Impacts will be assessed for all phases of the Proposed Development. Following the determination of impacts, mitigation measures will be identified, and residual impacts identified.

8.3.4 The EIAR will consist of a baseline assessment based on data collected from desk-based studies and surveys, the development of constraints, associated guidance, mitigation, and an assessment of the impacts.

8.3.5 Distinct and separate reports shall be provided, suitable for incorporation as Technical Appendices to the EIAR, as appropriate, covering:

57 SEPA (2022) *Technical* Flood Risk Guidance for Stakeholders. Version 13. Available at: https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf [Accessed January 2025]
58 SEPA (2022). *Water Environment (Controlled Activities) (Scotland) Regulations 2011 - A Practical Guide.* Version 9.
59 SEPA (2015). *WAT-PS-06-02: Culverting of Watercourses - Position Statement and Supporting Guidance.* Version 2. Available at: WAT-PS-06-02 [Accessed January 2025]
60 SEPA (2010). *Engineering in the Water Environment Good Practice Guide – River Crossings: WAT-SG-25.* Available at: River crossings - good practice guide [Accessed January 2025]
61 SEPA (2017). *Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.* Available at: *lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf [Accessed January 2025]
62 SEPA (2024). *Flood Risk and Land Use Vulnerability Guidance.*
63 SEPA (2024). *Climate change allowances for flood risk assessment in land use planning, Land Use Planning System SEPA Guidance.* Version 5.

- Peat survey results;
- Peat landslide hazard and risk assessment;
- Outline Peat Management Plan; and
- Carbon Balance Report, based on the Scottish Government Carbon Calculator.

8.3.6 An outline CEMP and Habitat Management Plan will be included as a Technical Appendix to the EIAR which will include mitigation measures, environmental management requirements, outline method statements, and environmental monitoring requirements.

Study Area

Hydrology and Hydrogeology

8.3.7 The Study Area, in respect of potential impacts on water resources, will include the Site extent plus a 2 km buffer. Additionally, the assessment will consider potential hydrological downstream connectivity to areas extending beyond this buffer (to a limit of 5 km). The study area will provide assessment of the potential for direct impacts to the water environment and indirect downstream impacts.

Geology and Soils

8.3.8 The study area, for potential impacts on peat and carbon-rich soils, considers land within the Site on the basis that whilst there is potential for connectivity with adjacent peatlands and soils, the effects are largely localised. However, this will be reviewed and updated, if necessary, during the assessment.

Baseline Characterisation

Hydrology and Hydrogeology

8.3.9 Consultation with Scottish Water and SIC will be undertaken to confirm if there are private or public water supplies for potable water that are located within 2 km of the Site. The presence/absence of water supplies would be confirmed though site inspection and consultation with landowners (if available).

8.3.10 A Site walkover will be carried out to hydrologically characterise areas of proposed infrastructure. The Site walkover will incorporate:

- identification of smaller watercourses and hydrological features not identified through desktop assessment, where there is the potential for interaction with proposed infrastructure;
- surveying of potential watercourse crossing locations in line with SEPA Guidance identified above. This survey will provide information on crossing locations, Controlled Activities Regulations (CAR) requirements, channel dimensions and likely crossing types; and
- ecological surveying would determine the presence of any potentially GWDTEs and both a desk based hydrological assessment and observations made during the Site walkover would determine the extent to which groundwater is likely to support such vegetation communities.

Geology and Soils

8.3.11 A desk-top review of available information will be undertaken to inform the baseline, including review of peatland habitat data.

8.3.12 Peat depth probing will be undertaken in accordance with good practice guidance and relevant methodologies. This will include a coarse resolution grid across the developable area of the Site, based on a 100 m grid (subject to access). The peat depth data will then be used to inform the design of the Proposed Development.

8.3.13 A higher resolution peat probing survey will be undertaken once the design of the Proposed Development has been advanced to include other proposed infrastructure such as along proposed tracks, at 50 m intervals, and at 10 m crosshairs at turbine locations. Further peat probing will ensure that all infrastructure locations have sufficient peat depth information to support relevant studies on peat instability, peat excavation and reuse, and carbon calculations.

8.4 Likely Significant Effects

Potential Impacts Scoped In

Hydrology and Hydrogeology

8.4.1 A number of waterbodies have been identified within the Site boundary, including watercourses within a 250 m radius of the proposed turbine locations in the north of the site. It is anticipated that standard best practice measures will be implemented through a CEMP that would be prepared by the appointed contractor and it is also anticipated that the design of the Proposed Development would minimise the potential for impacts to the water environment (i.e. embedded mitigation). It is therefore anticipated that a number of the points below would be managed by such measures. Where the potential for residual impacts is identified the EIAR would address additional design or management measures that would be implemented.

8.4.2 Based on baseline conditions described in **Section 8.2: Baseline Conditions**, it is anticipated that the following potentially significant effects could occur as a result of the Proposed Development.

8.4.3 There is the potential to alter in-channel and overland flow regimes through excavation, disruption to artificial drains and alterations to field drains and the exposure of bare earth or rock. Where existing infrastructure is retained, the site would rely on previously consented watercourse crossings and drainage infrastructure. Assessment of the condition and suitability of existing crossings and drainage measures would be carried out, alongside surveying of any new crossing points that may be required for the development of a watercourse crossing register.

8.4.4 There is the potential to permanently alter or disrupt shallow groundwater flow, in particular through the construction of tracks, drainage measures and turbine foundations.

8.4.5 Excavation of soil and bedrock during the construction phase of the Proposed Development could cause localised disruption and interruption to groundwater flow. Interruption of groundwater flow would potentially reduce the supply of groundwater to GWDTEs thereby causing an alteration/ change in the quality or quantity of and/or the physical or biological characteristics of the GWDTE. Contamination of groundwater may also cause physical or chemical contamination to the GWDTE.

8.4.6 In the event that PWS are found to be in hydrological or hydrogeological connection to the Proposed Development, there is the potential that the quality or quantity of water supply could be affected as a result of alterations in groundwater supplies (were any PWS within 250 m of the Proposed Development) or the upstream interaction of the Proposed Development with surface water supplies. Detailed assessment would be carried out where PWS are within potential hydrogeological connectivity to the Proposed Development (within 250 m) or where PWS are in downstream connectivity from construction activities.

Geology and Soils

8.4.7 The potential impacts scoped in are based on the baseline conditions described above. It is anticipated that the following potentially significant effects could occur as a result of the Proposed Development:

- There is the potential to alter in-channel or overland flow regimes through excavations, disruption to artificial drains, exposure of bare earth or rock, alteration to field drains and the construction of watercourse crossings, which could result in changes to the hydrology and hydrogeology, and subsequently affect the condition of peat at the Site;
- Potential for loss/disturbance to peat and carbon-rich soils as a result of excavations for wind farm infrastructure, and construction activities; and
- Erosion of peat and carbon-rich soils following disturbance may also be exacerbated as a consequence of localised drying of the peat and resultant oxidation.

Issues Scoped Out

Hydrology and Hydrogeology

8.4.8 Based on a review of SEPA Flood Maps, it is noted that fluvial and tidal flood risk is highly unlikely to increase as a result of the Proposed Development, as development would not be taking place on areas considered to be at risk of fluvial flooding or through a potential increase in flood risk downstream. As such, it is sought to scope out flood risk given that Proposed Development infrastructure would be located outside of Flood Zones 2 and 3 and surface water flood risks would be accounted for during detailed drainage design.

8.4.9 According to the BGS digital map and Hydrogeological and Groundwater Vulnerability Maps of Scotland (1:625,000), the Site is underlain by low productivity aquifers. If it is identified that potentially GWDTE (as identified by ecological surveying and classification of NVC communities) are not supported by groundwater supplies, in consultation with SEPA, it would be sought to scope out this assessment from the EIAR. The EIAR will provide a detailed assessment of potential effects the Proposed Development on surface water conditions supporting sensitive, non-groundwater dependent habitats.

Geology and Soils

8.4.10 Potential impacts on the operation of the Proposed Development will be scoped out of the EIA on the basis that they are unlikely to give rise to significant effects.

8.4.11 Potential impacts on geological receptors and contaminated land is also proposed to be scoped out as they are unlikely to give rise to significant effects.

Cumulative Effects

8.4.12 Potential cumulative environmental impacts to water, soils and geology resources will be assessed where concurrent proposed wind farm sites or construction activity may be in hydrological connection with the Proposed Development, or water resource receptors. Where potential cumulative impacts are identified, the same criteria for the assessment of the Proposed Development will be employed.

8.5 Questions to Consultees

Table 8-4 Questions to Consultees

Q8.1: Do you agree with the approach taken for the proposed assessment of geology and soils, particularly concerning impacts on peat and carbon-rich soils?
Q8.2: Based on initial review of the site, detail flood risk assessment is proposed to be scoped out. Were no PWS identified in potential hydrological/hydrogeological connection to the site, a separate PWS assessment (as Technical Appendix) would be scoped out. Please confirm that this approach is considered suitable.
Q8.3: Following hydrological and hydrogeological assessment Ramboll would seek to agree an approach to potential GWDTE vegetation communities on the site through consultation with SEPA. Were habitats found not to be groundwater dependent, separate assessment of GWDTE would be scoped out of the EIAR.

8.6 Additional Consultation

8.6.1 Consultation will be undertaken with the SEPA to inform the scope of the assessment.

8.6.2 Additional consultation would be carried out with Scottish Water and SIC to determine PWS locations and their proximity to the Site.

8.6.3 If potential GWDTE are identified through ecological surveying and these are found not to be supported by groundwater supplies, consultation would be carried out with SEPA to scope out a GWDTEs assessment from the EIAR.

9. NOISE AND VIBRATION

9.1 Overview

9.1.1 Noise will be emitted during the construction, operation, and decommissioning phases of the Proposed Development. This Section has been prepared by TNEI and provides a summary of the noise effects anticipated for each phase and, where appropriate, details the proposed assessment work.

9.1.2 This Section is supported by the following figure **(Appendix A)**:

- **Figure 9.1: Noise Contour Plot and Proposed Monitoring Locations.**

9.2 Baseline Conditions

9.2.1 The baseline environment is rural in nature and situated near to the coast. The noise levels are expected to be quiet, however the influence of sea noise would increase the noise levels. A number of Noise Sensitive Receptors (NSRs), mostly dwellings, have been identified in the area of Toft (to the east of the Proposed Development), Firth (to the south east of the Proposed Development), and Graven (to the south of the Proposed Development).

9.3 Assessment Scope and Methodology

Key Terms of Reference

9.3.1 The following relevant legislation and guidelines will be considered:

- NPF4[5];
- Onshore Wind: Policy Statement 2022 [64];
- Web Based Renewables Advice: 'Onshore Wind Turbines' [65];
- ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms'[66];
- Institute of Acoustics (IOA) 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' [67];
- British Standard BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound' [68];
- British Standard BS 5228-1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open developments - Noise'[69].

64 Scottish Government (2022). Onshore wind: policy statement 2022. [online] www.gov.scot. Available at: https://www.gov.scot/publications/onshore-wind-policy-statement-2022/ . [Accessed January 2025]

65 www.gov.scot. (n.d.). Onshore wind turbines: planning advice - gov.scot. [online] Available at: https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/ . [Accessed January 2025]

66 Noise Working Group (NWG) (1996), *ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms'.* Available at https://assets.publishing.service.gov.uk/media/5a798b42ed915d07d35b655a/ETSU_Full_copy__Searchable_.pdf [Accessed January 2025]

67 A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise. (2013). Available at: https://www.ioa.org.uk/sites/default/files/IOA%20Good%20Practice%20Guide%20on%20Wind%20Turbine%20Noise%20-%20May%202013.pdf [Accessed January 2025]

68 British Standard BS 4142:2014+A1:*2019 'Methods for Rating and Assessing Industrial and Commercial Sound'* (BSI, 2019). Available at: https://knowledge.bsigroup.com/products/methods-for-rating-and-assessing-industrial-and-commercial-sound?version=standard [[Accessed January 2025]

69 British Standard BS 5228-1: 2009+A1:2014 *'Code of practice for noise and vibration control on construction and open developments - Noise' (*BSI, 2014b). Available at: https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-noise?version=standard [Accessed January 2025]

Construction Noise

9.3.2 A construction noise assessment will be undertaken to determine the potential noise impacts during the construction of the wind turbines and ancillary infrastructure for the Proposed Development only. The construction noise assessment will be undertaken in accordance with BS5228-1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Noise'. The assessment will consider the temporary noise effects of construction on the nearest identified NSRs. Specifically, the assessment will consider noise arising from the use of borrow pits, concrete batching, construction compounds and laydown areas, vehicle movements within and accessing the site, and activities occurring at the base of the turbines.

Assessment Methodology: Operational Wind Turbine Noise

9.3.3 The Onshore Wind Policy Statement 2022 web-based planning advice states:

''The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments.'

9.3.4 The web-based document then refers to the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97' (IOA GPG) stating that it supports:

'the use of ETSU-R-97 when designing potential windfarm schemes, and the monitoring of noise levels from generating sites. The Scottish Government recognises this guide as a useful tool which developers can use in conjunction with ETSU-R-97.'

9.3.5 The web-based document concludes that:

'The Scottish Government is aware that the UK Government has been considering the extent to which ETSU-R-97 may require updating to ensure it is aligned with the potential effects from more modern turbines. The Scottish Government supports this work, and we anticipate the results of a short-term review project in due course.

'Until such time as new guidance is produced, ETSU-R-97 should continue to be followed by applicants and used to assess and rate noise from wind energy developments.'

9.3.6 In February 2023, WSP published 'A review of noise guidance for onshore wind turbines'[70] (the WSP/BEIS Report). The report, which was subsequently re-issued as Revision 4 in May 2023, was commissioned by the (former) UK Government Department for Business, Energy and Industrial Strategy (BEIS). The primary aim of the review was to make a recommendation on whether, in view of Government policies on noise and Net Zero, and available evidence, the existing guidance requires updating. The report concluded that current guidance would benefit from further review and recommended updates in a number of areas.

9.3.7 The UK Government Department for Energy Security and Net Zero (DESNZ) has awarded a tender to update ETSU-R-97. At the present time there are no set timescales for such an update to be published or adopted. Therefore, in line with the recommendations contained within the Onshore Wind Policy Statement, operational wind farm noise from the Scheme will be assessed in line with ETSU R 97 and the IOA GPG.

9.3.8 ETSU-R-97 details a methodology for establishing noise limits for proposed wind farm developments and these limits should not be exceeded. ETSU-R-97 states that noise limits should be set relative to existing background noise levels at the nearest receptors and that these limits should reflect the variation in both turbine source noise and background noise with wind speed. Separate noise limits

[70] WSP (2023). A Review of Noise Guidance for Onshore Wind Turbines [Online] Available at: Report for BEIS: A review of noise guidance for onshore wind turbines [Accessed: August 2023]

apply for quiet daytime and for night-time periods. Quiet daytime limits are chosen to protect a property's external amenity, and night-time limits are chosen to prevent sleep disturbance indoors, with windows open. The daytime noise limit is derived from background noise data measured during so-called 'quiet periods of the day', which comprise weekday evenings (18:00 to 23:00), Saturday afternoons and evenings (13:00 to 23:00) and all day and evening on Sundays (07:00 to 23:00). The night-time noise limit is derived from background noise data measured during the night-time periods (23:00 to 07:00), with no differentiation being made between weekdays and weekends.

9.3.9 ETSU-R-97 recommends that wind farm noise for the quiet daytime periods should be limited to 5 dB(A) above the prevailing background or a fixed minimum level within the range 35 - 40 dB $L_{A90,10min}$, whichever is the higher. The precise choice of criterion level within the range 35 – 40 dB(A) depends on a number of factors, including the number of dwellings in the neighbourhood of the wind farm (relatively few dwellings suggest a figure towards the upper end), the effect of noise limits on the number of kWh generated (larger sites tend to suggest a higher figure) and the duration and level of exposure to any noise. These factors will be taken into account with justification for deriving suitable noise limits included in the noise assessment.

9.3.10 An exception to the setting of both the quiet daytime and night-time fixed minimum limit occurs where a property occupier has a financial involvement with the Proposed Development. In that case the fixed minimum limit can be increased to 45 dB $L_{A90,10min}$ or the prevailing background noise L_{A90} plus 5 dB, whichever is the greater for both the quiet daytime and night-time periods.

9.3.11 The noise assessment for the Proposed Development will be undertaken in three stages:

- determine the 'Total ETSU-R-97 Noise Limits' which are applicable to the operation of all schemes in the area;
- undertake a cumulative assessment (where required) to determine whether predictions from all cumulative schemes meet the 'Total ETSU-R-97 Noise Limits'; and
- derive a set of Site Specific Noise Limits (for the Proposed Development) and undertake predictions to determine whether the Proposed Development can operate within the Site Specific Noise Limits.

9.3.12 It is proposed that the 'Total ETSU-R-97 Noise Limits' for the assessment will be based on the upper range of 35 - 40 dB noise limit during the daytime period and a 43 dB noise limit during the night-time period.

9.3.13 The guidance contained in the IOA GPG will be used to establish suitable Site Specific Noise Limits which fully take account of the proportion of the Total ETSU-R-97 Noise Limits which has been allocated too, and can realistically be used by existing operational wind farms in the area.

9.3.14 Consultation will be undertaken with the SIC Environmental Health Department prior to the commencement of the noise assessment in order to agree the overall assessment methodology and noise monitoring locations.

9.3.15 The noise assessment will include predictions of likely wind turbine noise levels across a range of wind speeds to demonstrate compliance with the Total ETSU-R-97 and Site Specific Noise Limits.

Assessment Methodology: Other Operational Noise

9.3.16 In respect to operational noise from the non-wind elements of the Proposed Development, such as the BESS and substation, these will be assessed in accordance with BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'.

9.3.17 The assessment compares the Rating Level of the plant, which is the predicted noise level plus any corrections for noise character, to the background sound level to provide an initial indication as to

the likelihood of adverse impact. This initial indication is then modified, if required, through a qualitative assessment that considers the context of the development.

9.3.18 The BS 4142 Background sound levels used for the assessment will be derived from the same set of data collected for the ETSU-R-97 assessment, however, this will be analysed considering low wind speeds (typically below 5m/s) only.

Study Area

9.3.19 The Study Area is defined by the location of the nearest high sensitivity NSRs on the assumption that if noise levels are acceptable at the closest, most sensitive NSRs, then noise level at greater distances will also be acceptable. In this case the closest High Sensitivity NSRs are residential receptors located at Toft. **Figure 9.1 (Appendix A)** presents the nearest identified NSRs.

9.3.20 Clusters of receptors are located at Mossbank and Firth, to the south east of the Proposed Development. To the south of the Proposed Development, a few properties are sparsely located, both inland and towards the western coastline.

Baseline Characterisation

9.3.21 A baseline noise survey will be undertaken to monitor noise levels at key representational Noise Monitoring Locations (NMLs). The locations of the NMLs will be agreed with the SIC in advance of the survey and the final locations will depend on the consultation response and practical aspects such as agreements from local residents to access their properties, however, at this stage it is anticipated that six NMLs will be required to provide a representative sample of the existing baseline levels for all of the nearest identified NSRs, as shown on **Figure 9.1**.

9.3.22 The survey will be undertaken for a minimum of 28 days. Equipment for measuring wind conditions will be installed on the development site for the duration of the noise survey to collect wind speed and direction data at various heights. Depending on the monitoring equipment used, data will be either measured directly at hub height or data collected at two different heights will be used to determine the wind speed at turbine hub height in accordance with the guidance in the IOA GPG.

9.3.23 Simultaneous 10 minute measurements will be taken by the wind and noise monitoring equipment over a period of at least 28 days.

9.4 Likely Significant Effects

Potential Impacts Scoped In

9.4.1 Where noise levels resulting from the operation of the Proposed Development are likely to be above the ETSU-R-97 derived limits, there is the potential for significant effects to occur. Accordingly, an assessment of operational turbine noise is scoped in.

9.4.2 Adverse noise impacts can occur from the operation of BESS plant and substation plant, therefore, depending on the final location of the BESS and substation (which may be positioned with significant separation distances between noise sources and receptors) an operational noise assessment may be required. At this stage an operational noise assessment of the BESS and substation is scoped in. If it is determined at a later stage that this is not required, it would be agreed with an Environmental Health Officer (EHO) prior to submission of the EIAR.

9.4.3 There is the potential for adverse but temporary noise effects from construction activities. Accordingly, an assessment of Construction Noise will be scoped in. However if it is determined at a later stage that a construction noise assessment is not required, it would be agreed with the EHO prior to submission of the EIAR.

Issues Scoped Out

9.4.4 Decommissioning Noise: The potential noise impacts from the decommissioning phase will be no greater than those predicted during the construction phase (as decommissioning is effectively a reversal of the construction process). On that basis, an assessment of decommissioning noise is scoped out.

9.4.5 Vibration: Given the nature of the likely construction activities and the large distances from construction areas to residential receptors, the risk of ground borne vibration impacting on residential receptors is considered very low. As such, a construction vibration assessment is scoped out.

9.4.6 Low-Frequency Noise: A study, published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI) [71], investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.

9.4.7 In February 2013, the Environmental Protection Authority of South Australia published the results of a study into in infrasound levels near wind farms. This study measured infrasound levels at urban locations and rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near wind farms are comparable to levels away from wind farms in both urban and rural locations. Infrasound levels were also measured during organised shutdowns of the wind farms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.

9.4.8 Bowdler et al., (2009) [72] concluded that:

"...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours".

9.4.9 During a planning Appeal (PPA-310-2028, Clydeport Hunterston Terminal Facility, approximately 2.5 km south-west of Fairlie, 9 Jan 2018), the health impacts related to low frequency noise associated with wind turbines were considered at length by the appointed Reporter (Mr M Croft). The Reporter considered evidence from Health Protection Scotland and the National Health Service (NHS). In addition, he also considered low frequency noise surveys undertaken by the Appellant and the Local Authority both of which demonstrated compliance with planning conditions and did not identify any problems attributable to the turbine operations; some periods with highest levels of low frequency noise were recorded when the turbines were not operating.

9.4.10 The Reporter concluded that:

- the literature reviews by bodies with very significant responsibilities for the health of local people found insufficient evidence to confirm a causal relationship between wind turbine noise and the type of health complaints cited by some local residents;
- the NHS's assessment is that concerns about health impact are not supported by good quality research; and
- although given the opportunity, the Community Council failed to provide evidence that can properly be set against the general tenor of the scientific evidence.

9.4.11 Low-frequency noise and infrasound is considered in the WSP BEIS report. The report considered a number of studies which investigated claimed links between adverse health symptoms and infrasound emissions from wind turbines. The report notes on page 116 that:

71 Department of Trade and Industry (2006). *The Measurement of LFN at three UK Wind Farms*.
72 Institute of Acoustics Bulletin (2009). Prediction and assessment of wind turbine noise.

'It has been demonstrated in controlled experiments, including the involvement of participants self-reporting to be sensitive to wind turbine infrasound, that exposure to infrasound at levels representative of wind turbine immissions at dwellings is not associated with physiological or psychological health effects, whereas the expectation of effects from being exposed to wind turbine infrasound, and positive or negative messages influencing that expectation, can affect health symptom reporting.

Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin.

It is expected that further evidence from ongoing studies into wind turbine infrasound effects will emerge soon, in particular from the NHMRC studies in Australia. However, based on the existing scientific evidence, it does appear probable that the above findings will not be contradicted by newer evidence.'

9.4.12 Since the publication of the WSP BEIS report, the study that was granted funding by the National Health and Medical Research Council of Australia (NHMRC) was published in the Environmental Health Perspectives (EHP) journal which is published by the United States National Institute of Environmental Health. The study[73] aimed to test the effect of exposure to 72 hours of infrasound (designed to simulate a wind turbine infrasound signature) exposure on human physiology, particularly sleep. The study concluded that:

'Our findings did not support the idea that infrasound causes WTS[74]. High level, but inaudible, infrasound did not appear to perturb any physiological or psychological measure tested in these study participants.'

9.4.13 It is therefore not considered necessary to carry out specific assessments of low frequency noise and that it should be scoped out.

9.4.14 Amplitude Modulation: In its simplest form, Amplitude Modulation (AM), by definition, is the regular variation in noise level of a given noise source. This variation (the modulation) occurs at a specific frequency, which, in the case of wind turbines, is defined by the rotational speed of the blades, i.e. it occurs at the rate at which the blades pass a fixed point (e.g. the tower), known as Blade Passing Frequency.

9.4.15 A study was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford[75], which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. The study defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the prevalence of AM on UK wind farm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

9.4.16 The study concluded that AM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7 % and 15 % of the time. It also stated that, the causes of AM are not well understood and that prediction of the effect was not currently possible.

9.4.17 This research was updated in 2013 by an in-depth study undertaken by Renewable UK[76], which has identified that many of the previously suggested causes of AM have little or no association to the

73 The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults. Available at The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults - PMC (nih.gov)

74 WTS stands for Wind Turbine Syndrome which is a term for adverse human health effected related to the proximity of wind turbines.

75 Research into aerodynamic modulation of wind turbine noise, Report by University of Salford for Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007, Contract NANR233

76 Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause & Effect

occurrence of AM in practice. The generation of AM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, it is not possible to predict whether any particular site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government.

9.4.18 In 2016, the IOA proposed a measurement technique to quantify the level of AM present in any particular sample of windfarm noise. In August 2016 a report written by WSP/Parsons Brinkerhoff was published by BEIS (formerly The Department of Energy & Climate Change). The report sought to build on the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition.

9.4.19 In November 2017, an article entitled 'A planning condition for wind farms' was published in Vol 42 No 6 of the Acoustics Bulletin magazine. The article was written collaboratively by a number of noise consultants and suggested a noise planning condition which included consideration of AM. The authors noted in the article that:

'Whilst local authorities and developers have waited for a planning condition that could be applied to newly consented wind farms, or to those already consented but with a suspensive condition, the report Wind Turbine AM Review (WTAMR) by WSP/Parsons Brinckerhoff for DECC arguably did not provide that. In addition there have been a number of comments on WTAMR that we consider should be addressed.'

9.4.20 The article then went on to propose a draft condition but noted that: 'This approach is proposed based on the current state of understanding but may be subject to modification in light of new research and further robust information.' And 'As various people before us have discovered, the derivation of a penalty is not easy. There is not sufficient reliable research to be confident that a penalty system would always provide a fair indication of the impact of AM.'

9.4.21 At the time of writing there has been no official response to those recommendations from the IOA Noise Working Group and, as yet, no endorsement from any Scottish Government Minister or Department. The recommendation to impose a planning condition and the associated penalty scheme is at odds with the advice from the IOA GPG which currently states (paragraph 7.2.10):

'7.2.1 The evidence in relation to "Excess" or "Other" Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM.'

9.4.22 The WSP BEIS report discusses AM, and on page 119 states that:

'At present, it seems evident that reliable predictions of AM in the context of development planning and noise assessment guidance are unlikely to be practically feasible in the near future.'

9.4.23 At time of writing there is no agreed methodology which can be used to predict the occurrence of AM or an agreed methodology which can be used to determine whether the effects of AM, should it occur, are likely to be significant. On that basis it is considered therefore that amplitude modulation should be scoped out.

Cumulative Effects

9.4.24 On review of other proposed/operational schemes in the area, it was found that the closest schemes (Beaw Field Wind Farm and Viking Wind Farm) are in excess of 10 km from the Proposed Development, and would not be considered to materially impact the Proposed Development with regards to cumulative noise. A review of nearby potential cumulative schemes will be undertaken as part of the design progress. No existing operational wind farm developments are located near the Site.

9.4.25 It is noted that a screening request was submitted to SIC on the 22nd October 2024 for the proposed development of two wind turbines. Should the application be taken further, a cumulative noise assessment will be undertaken.

9.5 Questions to Consultees

Table 9.1: Questions to Consultees

Q9.1: Can the consultees confirm that they agree with the proposed assessment methodologies, specifically the use of ETSU-R-97 and the IOA GPG to assess operational wind turbine noise, and BS4142 to assess Industrial Operational Noise?
Q9.2: Can the consultees agree that assessment of decommissioning noise, vibration, low frequency noise and amplitude modulation be scoped out of the EIA?

9.6 Additional Consultation

9.6.1 Consultation with the following stakeholders will be undertaken prior to commencement of the noise survey and assessment in order to agree the NMLs and approach to the survey and assessment:

- SIC Environmental Health Department.

10. TRAFFIC, TRANSPORT AND ACCESS

10.1 Overview

10.1.1 This chapter sets out the proposed approach to the assessment of potential environmental effects associated with increased road traffic during the construction of the Proposed Development, including identification of possible measures to minimise disruption to the local road network. This assessment will be undertaken by SYSTRA Limited.

10.2 Baseline Conditions

10.2.1 The Proposed Development is situated immediately to the east of the Sullom Voe oil terminal, 12km north of Voe, and 35km north of Lerwick on Shetland. The site access location is yet to be determined, however, full details will be provided at application stage including details of any new or modified junctions from the public road network.

10.2.2 Road access to the Site is generally of a good standard. It is expected that a good proportion of construction materials and deliveries will come via Lerwick and its associated harbour, then via the A970, A968 and B9076 to the Site.

10.2.3 The A970 is a single-carriageway road that runs from south to north on Mainland Shetland and provides a route north from Lerwick Harbour. From the settlement of Hillside, the A968 routes north towards Firth where it joins the B9076. From here construction vehicles would route west towards Sullom Voe and the Proposed Development.

10.2.4 An initial study has identified two potential Ports of Entry for delivery of the turbine components:

- The Port of Sullom Voe is a major deep water harbour that is owned and operated by SIC as Harbour Authority. Sullom Voe has not been used to import large-scale onshore wind turbine components before however if able to accommodate these components, then it would be highly beneficial for the project. The Port is located within 3km of the site, and the delivery route along the B9076 would be straight-forward.
- Lerwick Harbour is the principal commercial port for Shetland and provides services for the onshore and offshore oil and gas industry, large-scale decommissioning activities, offshore wind, and clean energy initiatives. In 2023, turbine components for the Viking Windfarm were landed at the port.

10.2.5 The traffic and transport chapter of the EIAR will provide a detailed description of each road link within the study area. An Abnormal Loads Assessment (ALA) will be undertaken to examine the access routes to Site and this will be provided as a Technical Appendix.

10.3 Assessment Scope and Methodology

Key Terms of Reference

10.3.1 Assessment of effects in relation to Traffic and Transport will be undertaken in line with current guidance and best practice. The following legislation, guidance and published data sources will be used to inform the assessment including:

- Guidelines for the Environmental Assessment of Traffic and Movement[77];
- NPF4[5];

77 Institute of Environmental Management and Assessment (IEMA) (2023). *Environmental Assessment of Traffic and Movement*. Available at: iema-report-environmental-assessment-of-traffic-and-movement-rev07-july-2023.pdf [Accessed January 2025]

- Transport Assessment Guidance[78]; and
- Design Manual for Roads and Bridges (DMRB)[79].

10.3.2 The effect of the increase in construction vehicle traffic movements will be quantified through comparison of existing traffic flows and vehicle composition (baseline data) with the flows predicted as a result of the construction of the Proposed Development. A detailed construction programme will be provided indicating construction traffic volumes by month.

10.3.3 Consideration of the potential effects on other road users will also be undertaken where road links are affected by construction traffic.

10.3.4 The 2023 Institute of Environmental Management and Assessment (IEMA) guidelines on the Assessment of Traffic and Movement set out a list of environmental effects which should be assessed for significance in relation to the transport resource as follows:

- Severance of communities
- Road vehicle driver and passenger delay
- Non-motorised user delay and amenity
- Fear and intimidation on and by road users
- Road user and pedestrian safety
- Hazardous/large loads

10.3.5 The assessment will explore whether potential effects are likely to be significant based upon two tests contained within the IEMA Guidelines. The guidelines suggest that, in order to determine the scale and extent of the assessment and the level of impact that the development will have on the surrounding road network, the following two 'rules' should be applied:

- Rule 1 - Include highway links where flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%; and
- Rule 2 - Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

10.3.6 These rules will be used as a screening exercise to determine whether a detailed assessment of effects on the routes within the study area is necessary. Where a detailed assessment is required, sensitivity and magnitude criteria will be used in order to determine the significance of effects.

Study Area

10.3.7 Based on the routes to Site identified in **Section 10.2: Baseline Conditions**, the study area for the assessment of traffic and associated environmental effects will include the following road links and associated corridors:

- A970
- A968
- B9076

10.3.8 The main sensitive receptors to increased traffic levels and associated environmental effects are likely to be residents of the isolated dwellings along the road corridors and those who use the roads

78 Scottish Government (2012). *Transport Assessment Guidance*. Available at: TRANSPORT ASSESSMENT GUIDANCE [Accessed January 2025]
79 National Highways, Transport Scotland, Welsh Government, Department for Infrastructure (various). Design Manual for Roads and Bridges.

for leisure and recreational purposes (cyclists etc), particularly as sections of the study area road links are part of the Sustrans: Sumburgh to Lerwick and Norwick route.

Baseline Characterisation

10.3.9 The scope of survey works relating to traffic and transport is likely to include the desk-based collation of publicly available traffic count data. For the local road network, we will investigate whether any historical data exists within the DfT database. If no data is available, then new count data will be collected by means of new 7 day Automatic Traffic Count (ATC) surveys. The location and timing of any new surveys would be agreed with SIC in advance of surveys taking place.

10.3.10 Accident data for the local road network will be obtained from the CrashMap website, utilising the most recent available five year data period.

10.4 Likely Significant Effects

Potential Impacts Scoped In

10.4.1 The main potential effects of the Proposed Development are associated with increased traffic flows, or changes to the traffic composition, as a result of traffic movements during construction. These traffic effects may arise during the construction phase. The greatest volume of construction traffic will likely be experienced over the first few months of the construction period as materials are delivered for access tracks and site establishment. The EIAR chapter will set out the key construction activities and will identify the volume of vehicle movements associated with each of these activities.

10.4.2 An ALA will be undertaken to examine the access routes to Site. This will be submitted as a Technical Appendix to the EIAR identifying any pinch points and where road improvements might be required to accommodate abnormal loads between the port of entry and the Proposed Development.

Issues Scoped Out

10.4.3 On the basis of the detailed desktop study, the professional judgement of the EIA team and experience from other relevant projects and policy guidance, the following effects will be scoped out of the access, traffic and transport assessment:

- Operational Stage - Once the Proposal is operational, the amount of traffic associated with wind farms and battery energy storage systems is minimal, relating to maintenance only. It is estimated that on average there will be just a small number of 4x4s accessing the Application Site on an infrequent basis. Therefore, the effect of vehicle movements during the operational phase will be negligible. In respect of access, traffic and transport, the operational phase of the proposed Development will therefore not be assessed in this Chapter.
- Decommissioning Stage - Planning permission for the proposed Development is sought for a 40 year period, after which the Development will be decommissioned unless a further application is submitted for an operational extension. Traffic associated with the decommissioning stage is anticipated to be significantly less than that generated during construction. Given the timescales involved and the likelihood for changes to the baseline situation during this period, the access, traffic and transport effects of decommissioning will not be assessed.

Cumulative Effects

10.4.4 The potential for cumulative effects will be considered with other wind farms or other developments which are proposed to use the same public roads as the Proposed Development during construction and which could overlap in terms of construction timescales.

10.5 Questions to Consultees

Table 10.1: Questions to Consultees

Q10.1: Could consultees provide confirmation of the acceptability of scoping out operational and decommissioning effects in respect of access, traffic and transport is requested.
Q10.2: Could consultees provide confirmation that the routes to be assessed within the study area are appropriate.
Q10.3: Could consultees please confirm details of any developments which should be considered in terms of the Cumulative assessment of traffic and transport effects.

10.6 Additional Consultation

10.6.1 Consultation will be undertaken with SIC to inform the assessment of effects in relation to the local road network.

11. AVIATION

11.1 Overview

11.1.1 This Section sets out the proposed approach to the assessment of potential effects on aviation and radar during the construction and operation of the Proposed Development.

11.1.2 Wind turbines have the potential to reduce the performance of radars used for air traffic control, air defence and meteorological forecasting, and of aeronautical radio navigation and communications equipment. They may also pose an obstacle hazard to aircraft in the vicinity of aerodromes or engaged in low altitude flight.

11.2 Baseline Conditions

11.2.1 The Site is located in uncontrolled airspace from surface level up to Flight Level 195 (approximately 19,500 feet above sea level). Above that level is the Class C controlled airspace of the Scottish Flight Information Region (FIR) and Upper Information Region (UIR). Since the permanent closure of Scatsta Airport (3.5 km south west of the Site) in June 2020 the only air traffic in the airspace overhead the Site is occasional flights by the Sumburgh-based search and rescue helicopter at low altitudes and regular transatlantic/transpolar commercial jet traffic at altitudes in excess of 30,000 ft.

11.2.2 Air traffic services in the airspace in the vicinity of the Site are provided by NATS to offshore support helicopters and to high level en route traffic. Both services are provided principally using secondary surveillance radar (SSR) only. The nearest SSR facility is at Fitful Head, 62 km south of the Site, well beyond the range at which SSR is potentially affected by wind turbines.

11.2.3 The only airfield within 20 km radius of the Site is the unlicensed airstrip on Whalsay, 19 km south east of the Site. This is not in regular use and the CAP 764 recommended consultation radius for airfields of this size is 3 km.

11.2.4 There are no other aviation activity sites, aeronautical radio navigation aids, aeronautical radio transmitter sites or Met Office radar sites within 20 km radius of the site.

11.2.5 A Lockheed Martin TPS-77 air defence radar is located at Remote Radar Head (RRH) Saxa Vord, 45km north north east of the site.

11.2.6 The Site is located in daytime military Low Flying Area (LFA) 14, where low level flight at a minimum of 250 feet agl is permitted. This part of LFA 14 is classified by the Ministry of Defence (MoD) as a "low priority military low flying area less likely to raise concerns". Shetland is not part of the Night Low Flying System. Military low flying at night over Shetland only takes place on an ad hoc individual basis, requiring special approval.

11.3 Assessment Scope and Methodology

Key Terms of Reference

11.3.1 The aviation assessment of the Proposed Development will be conducted in accordance with the guidance set out in CAP 764[80], the CAA policy and guidance on wind turbines.

Study Area

11.3.2 The Study Areas to be adopted vary according to the aviation receptor and will be as follows:

[80] Civil Aviation Authority (2016). CAP 746: Policy and Guidelines on Wind Turbines. Available at: CAP 764: Policy and Guidelines on Wind Turbines | Civil Aviation Authority [Accessed January 2025]

- Air defence and air traffic control Primary Surveillance Radars (PSRs): 70 km radius from the Site. This ensures that all such radars that have the operational range and unobstructed line of sight to the Proposed Development are included in the assessment;
- SSRs: 27.8 km radius from the Site. This is the official safeguarding distance applied around NATS En Route SSR facilities;
- Aeronautical radio navigation beacons: 10 km radius from the Site. This is the safeguarding consultation radius adopted by NATS En Route, the principal operator of such equipment in the UK;
- Aerodromes with Instrument Flight Procedures (IFPs): 60 km from the Site. This will ensure that all possible effects on IFPs are considered;
- All other licensed or certificated aerodromes: 20 km from the Site. This is to allow for potential impacts on obstacle limitation surfaces to be accounted for;
- Unlicensed aerodromes and landing sites: 10 km from the Site. This is to reflect advice contained in CAA guidance; and
- Meteorological Office radars: 25 km from the Site. This is sufficient to encompass the Met Office wind farm consultation radius of 20 km.

Baseline Characterisation

11.3.3 The aviation baseline will be determined through use of the UK Aeronautical Information Publication (AIP); the UK Military AIP; aeronautical charts; and Aviatica in-house databases.

11.4 Likely Significant Effects

Potential Impacts Scoped In

11.4.1 In its operational phase, the Proposed Development has the potential to generate false plots on the Saxa Vord air defence radar. These effects will be assessed in the EIA.

11.4.2 Obstacle hazard effects on low flying military aircraft will be assessed in the EIA. These effects may occur during the construction, operating and decommissioning phases.

Issues Scoped Out

11.4.3 Potential effects on air traffic and Meteorological Office radars; licensed and certificated aerodromes; and aeronautical radio navigation equipment will be scoped out of the EIA since there are no such facilities in the Study Area.

11.4.4 Effects on the Whalsay unlicensed aerodrome will be scoped out since the Site is well beyond the radius recommended by the CAA for consultation with aerodromes of its size.

Cumulative Effects

11.4.5 Cumulative impacts on the Saxa Vord air defence radar will be assessed by considering other wind farm developments within 20 km radius of the Site that are also within line of sight of the radar.

11.5 Questions to Consultees

Table 11.1: Questions to Consultees

Q11.1: Is the assessment methodology appropriate?

Q11.2: Does the scope of the assessment cover all potentially affected aviation activity?

12. TELECOMMUNICATIONS

12.1 Overview

12.1.1 This Section of the Scoping Report assesses the potential impact of the Proposed Development on telecommunications and sets out the proposed methods for assessing those impacts.

12.1.2 Wind turbines and other objects placed close to the path of a fixed radiocommunications link can degrade the performance of the link as a result of diffraction and reflection/scattering of the radio waves.

12.2 Baseline Conditions

12.2.1 Interrogation of the Ofcom Spectrum Information Portal indicates that there are three licensed fixed radio links that pass over or within 1 km of the Site.

12.2.2 Arqiva has advised that it has no objections to the Proposed Development.

12.2.3 Atkins has advised that it has no objections to the Proposed Development.

12.2.4 The Joint Radio Company (JRC) has advised that the Proposed Development could affect one Ultra High Frequency (UHF) scanning telemetry and one microwave link operated by SSE.

12.3 Assessment Scope and Methodology

Key Terms of Reference

12.3.1 The telecommunications assessment will be conducted through consultation with telecommunication link operators, informed by the Ofcom-recommended 'Bacon formula' for assessing the effects of wind turbines on microwave telecommunications links.

Study Area

12.3.2 The Study Area for telecommunications is the area within 1 km radius of the Site.

Baseline Characterisation

12.3.3 The baseline has been determined from interrogating the Ofcom Spectrum Information Portal and Wireless Telegraphy Register and from consultations with JRC, Atkins and Arqiva

12.4 Likely Significant Effects

Potential Impacts Scoped In

12.4.1 Effects on fixed microwave and UHF scanning telemetry links may occur in the construction, operational and decommissioning phases. These effects will be assessed in the EIA.

Issues Scoped Out

12.4.2 Effects on water industry UHF scanning telemetry links managed by Atkins and television re-broadcasting links operated by Arqiva will be scoped out since the operators have advised that they have no such facilities with the potential to be affected by the Proposed Development.

Cumulative Effects

12.4.3 Cumulative effects will be assessed by reviewing whether any other wind energy developments have the potential to affect the telecommunications links that may be affected by the Proposed Development.

12.5 Questions to Consultees

Table 12.1: Questions to Consultees

Q12.1: Is the assessment methodology appropriate?
Q12.2: Does the scope of the assessment cover all potentially affected telecommunications facilities?

13. SHADOW FLICKER

13.1 Overview

13.1.1 Under certain combinations of geographical position, times of day and year, the sun may pass behind the turbine rotor and cast a shadow over the windows of neighbouring buildings. When the blades rotate and the shadow passes a window, to a person within that room, the shadow appears to flick on and off; this effect is known as 'shadow flicker'. This effect occurs only within buildings where the flicker appears through a window aperture and in the UK this typically occurs only in buildings within 130 degrees either side of north relative to a turbine.

13.1.2 This Section details the proposed methodology for assessing the effects of shadow flicker from the Proposed Development.

13.2 Baseline Conditions

13.2.1 A desk-based analysis confirmed that there are multiple residential properties within 10 rotor diameters and within 130 degrees either side of north of the Proposed Development.

13.3 Assessment Scope and Methodology

Key Terms of Reference

13.3.1 A formal standard for conducting shadow flicker assessments is not available in the UK. Therefore, there are also no guidelines quantifying what exposure levels would represent a significant versus not significant effect.

13.3.2 The Scottish Government[81] advises that "*where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), 'shadow flicker' should not be a problem.*"

13.3.3 Multiple sources outwith the UK offer guidance and recommendations for conducting shadow flicker assessments. Both the Department of Instructure (Ireland)[82] and Predac (EU sponsored organisation)[83] recommend that a maximum of 30 hours per year or 30 minutes per day is acceptable for properties within 500 m of a turbine.

13.3.4 In the absence of formal guidance / standards for conducting the shadow flicker assessment within the UK, taking into account the Scottish Governments[81] advice and guidance available outwith the UK[82,83], the EIAR will consider, as a conservative approach, that shadow flicker should not exceed 30 hours per year or 30 mins per day at all residential properties within 10 rotor diameters of the Proposed Development. Any properties exceeding this threshold will be considered as subject to significant effects.

Study Area

13.3.5 On the basis of the Scottish Governments[81] advice[81] the Study Area for the shadow flicker assessment is limited to 10 rotor diameters, 130 degrees either side of north of the proposed turbines.

81 Scottish Government (2014). *Onshore Wind Turbines: Planning Advice*. Available at: https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/ [Accessed January 2025]

82 Department for Infrastructure (2019). *Best Practice Guidance to PPS 18 ' Renewable Energy'*. Available at: https://www.infrastructure-ni.gov.uk/publications/best-practice-guidance-pps-18-renewable-energy [Accessed January 2025]

83 Predac (2004). Spatial Planning of Wind Turbines.

Baseline Characterisation

13.3.6 Proprietary software (either Resoft WindFarm or WindPro) will be used to identify the potential receptors susceptible to shadow flicker based on the turbine dimensions and orientations.

13.3.7 Following this, a site survey will be undertaken to confirm the following:

- Presence and use of buildings identified;
- Presence and use of unidentified building;
- Orientation of buildings;
- Location of windows; and
- Location of any features that may act to screen the buildings from shadow flicker.

13.3.8 Lastly, following the site survey, shadow flicker modelling will be undertaken to provide details on the predicted frequency of occurrence of shadow flicker at each window location.

13.4 Likely Significant Effects

Potential Impacts Scoped In

13.4.1 During the operational phase, there is potential for significant effects of shadow flicker under certain combinations of geographical position, times of day and year, where the sun may pass behind a turbine rotor and cast a shadow over the window(s) of neighbouring buildings within the Study Area, which as the blades rotate, causes the shadow to appear to flick on and off.

Issues Scoped Out

13.4.2 Where moving shadows are cast over the ground, rather than through the windows of a building, this is known as 'shadow throw'. There are no guidelines to quantify the effect and no requirement to assess shadow throw. Therefore, shadow throw will not be considered in the assessment.

Cumulative Effects

13.4.3 A review of cumulative developments will be undertaken during the EIA process to identify any wind energy developments (either operational, consented or subject to a current planning application) with the potential for cumulative shadow flicker effects; any such developments will be assessed accordingly in line with the methodology outlined.

13.5 Questions to Consultees

Table 13.1: Questions to Consultees

Q13.1: Do you agree with the scope of the shadow flicker assessment?

14. TOPICS SCOPED OUT OF THE EIA

14.1 Socio-Economics

14.1.1 The Proposed Development would generate temporary employment opportunities during the construction phase, with associated indirect and induced economic effects through additional spending on local services and resulting beneficial impacts on the local economy. Job creation during the operational phase would be related to the ongoing operations and maintenance of the wind farm.

14.1.2 The economic effects of the Proposed Development are expected to be beneficial. This is supported by the numerous assessments of socio-economic effects undertaken as part of the EIA process for other wind farm developments in Scotland and elsewhere in the UK. There would be no significant effect to existing economic use of the Site, which is a greenfield, bordering with a large industrial site comprising the Sullom Voe Oil Terminal and associated infrastructure. Accordingly, it is proposed to scope out an assessment of socio-economic effects from the EIAR.

14.1.3 A standalone Socio-economic Statement will be submitted as part of the application in order to identify the relevant economic information related to the Proposed Development. This will include information on the direct benefits of the Proposed Development, along with the indirect benefit enabled but not directly controlled by the Applicant.

14.1.4 In respect of tourism and recreation, a wealth of literature exists that looks at the impacts of wind farms specifically on tourism. In addition, research[84] suggests that there is no evidence that the presence of wind farm developments have an adverse effect on the tourism sector in Scotland, and no relationship has been identified between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority nor in the areas immediately surrounding wind farm development. Some literature is in fact suggestive of the potential for a positive relationship to exist between tourism and wind farm development. In any case, any effects that may occur are not expected to be significant in the context of the EIA regulations.

14.1.5 The potential impacts on visual amenity for tourism and recreational locations in proximity to the Site will be assessed in the EIAR as part of the SLVIA.

14.2 Climate Change

Carbon Emissions

14.2.1 The Proposed Development itself would contribute positively to climate change mitigation through the production of renewable energy and a corresponding reduction in carbon emissions from other more carbon intensive generation sources.

14.2.2 However, it is acknowledged that the Proposed Development would still give rise to carbon emissions associated with its construction. Accordingly, a Carbon Balance assessment will be prepared and submitted as a Technical Appendix to the EIAR. The report will include a calculation of the expected carbon savings over the lifetime of the Proposed Development and will be presented using the latest version of the Scottish Government's Carbon Calculator Tool[85]. This remains the suitable standardised tool for use in relation to net carbon saving calculations for wind farm developments across the UK.

84 BiGGAR Economics (2021). Wind Farms and Tourism Trends in Scotland: Evidence from 44 Wind Farms. Available at https://biggareconomics.co.uk/wp-content/uploads/2021/11/BiGGAR-Economics-Wind-Farms-and-Tourism-2021.pdf [Accessed January 2025].
85 Scottish Government Carbon Calculator Tool. Available at http://informatics.sepa.org.uk/CarbonCalculator/ [Accessed January 2025]

14.2.3 The assessment will be undertaken in accordance with the Scottish Government's recommended methodology[86] and will present the carbon emissions associated with ground conditions, access preparations, foundation excavations, materials used on-site, the transportation of materials and components to Site, and any other carbon loss (e.g. through the degradation of peat/peaty soils).

Climate Resilience

14.2.4 The vulnerability of the Proposed Development to climate change will be considered as part of the detailed design process, which will consider the potential consequences of climate change (e.g. increased flood risk potential and more extreme weather conditions).

14.2.5 The Proposed Development's response to climate resilience risks will be provided in the introductory chapters of the EIAR and description of the Proposed Development. Consideration will be given to appropriate design mitigation measures to ensure the Proposed Development is resilient to a changing climate.

14.2.6 With adoption of a climate resilient design and the assessment of key environmental risks associated with climate change (e.g. flood risk) as an integral part of the 'scoped in' environmental topics, it is proposed to scope out an assessment of climate resilience from the EIAR.

14.3 Air Quality

14.3.1 The Proposed Development is not considered likely to give rise to significant effects on air quality. The main activities that could have potential impacts would be limited to construction works:

- Construction and decommissioning works, giving rise to dust emissions from earthworks (potentially including occasional blasting) and from vehicles running over unsurfaced ground; and
- Exhaust emissions from fixed and mobile construction plant and construction vehicles.

14.3.2 Construction works would be localised, short term, intermittent and controllable through the application of good construction practice. Fixed and mobile plant would be limited in size and number and would operate for short periods. Measures to manage air quality during construction, such as dust management, will be included in the outline CEMP to be appended to the EIAR.

14.3.3 The contributions of exhaust emissions (NO_2 and PM_{10}) from construction vehicles would likely be low, and orders of magnitude below current UK Air Quality Strategy Objectives[87].

14.3.4 Once operational, the only source of emissions would be from occasional maintenance vehicles, and accordingly any impacts would be negligible. Therefore, it is proposed that air quality is scoped out of the EIAR.

14.4 Population and Human Health

14.4.1 The EIA will consider "human health" in terms of amenity through the assessment of potential likely significant effects associated with water supplies, air quality, noise, traffic, visual amenity and shadow flicker. The low population density in proximity to the Proposed Development means impacts on the amenity of householders, through issues such as noise and visual impacts, will be minimised. No other sources or pathways for effects on human health have been identified.

86 Nayak et. al., (2010) Scottish 'Calculating Carbon Savings from Wind Farms on Scottish Peatlands – A New Approach'. Available at:https://www.gov.scot/publications/calculating-carbon-savings-wind-farms-scottish-peat-lands-new-approach/ [Accessed January 2025]
87 UK Air Quality Strategy Objectives. Available at https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update_20230403.pdf [Accessed January 2025]

14.4.2 The potential for likely significant effects on "population" will be considered within the Socio-economic Statement which will accompany the Application (as described above).

14.4.3 Appropriate control measures to ensure that potential construction effects on air, noise and water quality are managed appropriately will be addressed through an outline CEMP which will form a Technical Appendix to the EIAR. A similar decommissioning management plan would be prepared for the decommissioning phase in line with the relevant guidance requirements at that time.

14.4.4 As such, a separate human health impact assessment chapter and population impacts assessment chapter will not be presented in the EIAR.

14.5 Ice Throw

14.5.1 Standard mitigation for the risk of ice throw comprises off-site monitoring to enable the deactivation of turbines on sensing ice accumulation, as well as physical and visual warning for both site personnel and third parties.

14.5.2 In line with current guidance, a permanent warning sign at the Site entrance is proposed to alert the public to this issue.

14.5.3 As such, no detailed assessment is proposed as part of the EIAR.

14.6 Risk of Major Accidents and/or Disasters

14.6.1 Based on publicly available information, the following neighbouring operational establishments that are covered by the Control of Major Accidents Hazards (COMAH) Regulations 2015[88] have been identified:

- Shetland Gas Plant, located approximately 230 m south west of the Site, operated by Total Energies E&P UK Ltd; and
- Sullom Voe Oil Terminal, located approximately 1 km east of the Site, operated by EnQuest Heather Ltd.

14.6.2 Both establishments are classed as Upper Tier COMAH sites and as such, are subject to more stringent requirements to ensure they are operated safely.

14.6.3 There are also two major accident hazard pipelines which support the COMAH site, located in the southern extents of the Site:

- Laggan Tomore Pipeline/PTDS operated by Total E&P UK Ltd; and
- Ninian Pipeline operated by BP Exploration Operating Co Ltd.

14.6.4 The COMAH sites are identified as complex industrial facilities focussing on the processing of oil and gas with storage tanks, pipelines and petrochemical processing facilities. As such, the integrity and reliability of this infrastructure is critical for preventing incidents and minimising the potential consequences which could impact the Proposed Development. Baseline sensitivities of these establishments are reflected in their COMAH related documentation, risk assessment process, emergency planning and safety measures. **Appendix D** presents a summary table of the major accident scenarios and control measures for the two COMAH sites.

14.6.5 A key factor in the interaction between the Proposed Development and the COMAH sites is whether the Proposed Development falls within the Land Use Planning (LUP) consultation zones of the COMAH sites, which are established by the Health and Safety Executive (HSE). The LUP consultation zones relate to the facilities risks and hazards associated with the protection of people from a major accident. Risks and hazards associated with the consultation zones are greatest in the Inner Zone,

88 UK Government (2015). *The control of Major Accident Hazards Regulations 2015*.

and hence development would be subject to greater restrictions compared to the Middle Zone and Outer Zone. The north western extent of the Site is located within the Inner Consultation Zone for the Shetland Gas Plant. The north western extent of the Site borders the Outer Consultation Zone for Sullom Voe Oil Terminal.

14.6.6 The HSE assess developments by taking into consideration the sensitivity level of the development type and the zone in which the development type lies. There are four development types:

1. People at work
2. Developments for use by the general public
3. Developments for use by vulnerable people
4. Very large and sensitive developments

14.6.7 It is considered likely that the Proposed Development would be classified as Development Type 1. Where the expected number of occupants in the development is less than 100. It is not envisaged that operators will be permanently based at the Proposed Development and that their presence will consist of visits to monitor the turbines, perform repairs and ensure optimal performance. However, it is expected that the construction phase of the development will temporarily increase the presence of people within the consultation zones.

14.6.8 The construction, operation and decommissioning of the Proposed Development would be undertaken under relevant health and safety regulations including the requirements of the Construction (Design and Management) Regulations[89]. A risk assessment process will be followed by the Principal Designer during the design stage, which will ensure that all potential risks are identified at an early stage and appropriate mitigation is implemented.

14.6.9 The most significant major accident that could affect the Proposed Development from the neighbouring COMAH sites and major accident hazard pipelines are expected to involve fire and explosion scenarios. This could lead to a potential domino effect involving the Proposed Development, especially given the presence of lithium in BESS, which is highly combustible.

14.6.10 With the most significant major accident and disaster that could affect the Proposed Development involving a fire and explosion scenario, the distance between the Proposed Development and COMAH sites and major accident pipelines will be maximised during the design stage as far as is reasonably practicable.

14.6.11 The use of a BESS can pose safety risks such as thermal runaway, which can lead to fires or explosions if not properly managed. The following risk mitigation measures would be considered at the detailed design stage:

- Thermal management: effective thermal management systems to prevent overheating and thermal runaway. This includes adequate cooling and ventilation systems, as well as temperature monitoring and control mechanisms;
- Fire systems: installation of systems such as fire detection and suppression systems to quickly detect, contain and extinguish fires in the event of thermal runaway or other incidents;
- Physical separation: proper physical separation between battery modules and other equipment to prevent cascading failures and mitigate the spread of fires or explosions, potentially impacting neighbouring sites and causing domino effects; and
- Regulatory compliance: adherence to relevant codes and standards governing the installation and operation of BESS.

89 Construction (Design and Management) Regulations 2015. Available at: https://www.legislation.gov.uk/uksi/2015/51/contents/made [accessed January 2025].

14.6.12 Other mitigation measures including monitoring systems of key parameters such as air quality, noise levels and structural integrity as well as remote sensing technologies and having emergency preparedness and response plans will be considered.

14.6.13 It is considered that the implementation of the above mitigation measures and legal requirements in conjunction with the controls/standards already in place at the COMAH sites adequately controls the potential for major accidents and disasters. As such, it is proposed to scope out an assessment of major accidents and disasters from the EIAR.

14.6.14 Pre-application consultation with HSE will be undertaken in parallel to the EIA to obtain an indication of HSE's advice for the Proposed Development.

15. NEXT STEPS

15.1.1 This report is provided to support a request under Regulation 12 of the EIA Regulations for a 'Scoping Opinion' regarding the information to be provided within the EIAR which will accompany the Application.

15.1.2 In forming its opinion, the Scottish Ministers will seek the views of various organisations with an interest in the Proposed Development, inviting comments on the proposed scope of and approach to the EIA proposed herein.

15.1.3 The Applicant requests that the Scottish Ministers clearly differentiate in their Scoping Opinion between responses received as part of their consultation on the scope of the EIA which they adopt as part of the Scoping Opinion and those responses received which are treated as advisory and passed to the Applicant for information (not forming part of the Scoping Opinion).

APPENDIX A
FIGURES

APPENDIX B
GAZETTEER OF HERITAGE ASSETS AND EVENTS

Asset/Event Number	1
Asset/Event Name	Busta, standing stone 100m E of Staneside
Type of Asset/Event	Standing Stone
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM2028
HER Number	797
Status	Scheduled Monument
Easting	434878
Northing	1167393
Parish	Delting
Council	Shetland Islands
Description	The monument is a standing stone likely to date to the third or second millennium BC. Formed of granite, it stands 3.2m high and is roughly square in plan, with sides a maximum of 1.8m in length at the base. A smaller recumbent stone, lying 7m to the east and 1m high, is a squat triangular block also of granite. The monument stands at around 25m above sea level in a prominent location 80m from the W shore of Busta Voe. Its location offers views across the voe to the E shore. Likewise, the main stone is highly visible and prominent when viewed from the water or from across the voe. The monument was first scheduled in 1954 but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is irregular on plan, measuring 20m E-W by 11m transversely. The scheduling includes the two stones described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument includes a fine example of a massive standing stone that survives in excellent condition. Several packing stones are visible at the base. We know of no evidence that the stone has been moved and it is therefore likely to stand within its original socket, probably a shallow depression or pit. In addition to the visible packing stones, other archaeological material, including possibly burial deposits, may lie at the base of the stone. Other related features, including smaller stone settings, pits, burials and timber structures, may be present in the immediate vicinity. It is clear that in some instances, standing stones represent the only surviving component of a larger stone monument (such as a stone alignment). As well as the smaller recumbent stone that is visible today east of the standing stone, other stones may have stood in the vicinity. The likely presence of associated artefacts and/or important environmental information in a pit beneath the stone, or in surrounding features, reinforces the potential of the monument. In this case, considerable effort would have been required to transport, position and erect the stone, demonstrating that it was considered a significant and worthwhile achievement to those who were responsible. Where it has been possible to date comparable monuments, they typically derive from the third or second millennium BC. The monument therefore has an inherent capacity to inform our understanding of this period, and may have the potential to further our knowledge of contemporary ceremonial and ritual landscapes. Contextual characteristics; In Scotland as a whole, standing stones are very often located with reference to ritual or burial monuments, such as henges, stone circles, cairns and other types of burial, and there are grounds to believe that many are part of ceremonial or ritual activity. In addition, the position of many appears deliberately chosen to take advantage of route-ways, views and inter-visibility with other monuments, and some are likely to be part of a network of landmarks. It has been argued that the position of some standing stones, with reference to similar contemporary monuments, often coincides with observation lines upon the rising or setting points of the sun or the moon on a distant horizon at key dates in the year (for example, winter solstice). This monument dominates the head of Busta Voe. The voe was probably an important route-way as Sullum Voe lies to the north, across a short land bridge only 0.5km wide, and offers access northwards to the E coast of Mainland. The monument also lies within a concentration of other prehistoric monuments, including three cairns in locations that can be seen from this monument (one is

	1.1km to the SW and the other two lie within 1.8 km, on the E side of the voe). A chambered cairn and two prehistoric houses also lie within 1.5km to the west, but are not visible from this standing stone. Further study of the prehistoric monuments here may further our understanding of the nature of their inter-relationships and increase our knowledge of the way in which contemporary society may have used different parts of the landscape. Associative characteristics; The Ordnance Survey 1st edition map depicts the standing stone. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular the ritual and ceremonial landscape of Shetland in the third or second millennium BC. This standing stone is also important because it lies in a landscape that contains a relatively high density of other types of prehistoric monument. The loss of this monument would significantly impede our ability to understand the nature of earlier prehistoric ritual and ceremonial practice, both in Shetland and in Scotland.

Asset/Event Number	2
Asset/Event Name	Punds Water, chambered cairn 60m S of, Mangaster
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM2042
HER Number	828
Status	Scheduled Monument
Easting	432455
Northing	1171248
Parish	Northmaven
Council	Shetland Islands
Description	The monument consists of a well-preserved prehistoric chambered burial cairn. The cairn is one of the best preserved in Shetland, and is of typical "heel-shaped" plan, with a SE-facing concave facade, 16m long and carefully built, from which a narrow passage leads into the inner chamber. This is trilobate in plan. A kerb of large boulders delimits the cairn on all sides except the SE. Cairn material has spilled out beyond the kerb. The area to be scheduled is circular, 40m in diameter and centred on the chamber of the cairn, to include the cairn and an area around it in which traces of activities associated with its construction and use may survive. The area is marked in red on the accompanying map.

Asset/Event Number	3
Asset/Event Name	Burra Voe, broch 70m SSE of Wester Ayre
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM2052
HER Number	1327
Status	Scheduled Monument
Easting	451882
Northing	1179274
Parish	Yell
Council	Shetland Islands

Description	The monument comprises the remains of a broch of Iron Age date, built probably between 500 BC and AD 200, and the remains of an outer rampart. The broch is visible as a large turf-covered mound, about 26m in diameter. The outer wall face is visible in places and shows that the broch tower itself measures about 19m in diameter. On the S side of the mound a curving rampart is indicated by a low turf covered bank, 20m long, with remains of a stone revetment visible on the outer face. The monument stands less than 10m above sea level on a promontory lying immediately north of the mouth of Burra Voe, on the SE coast of Yell. The monument was first scheduled in 1934 but the documentation does not meet modern standards; the present rescheduling rectifies this. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The sea defences and buildings in use lie outside the scheduled area and are excluded from the scheduling. The scheduling specifically excludes the above-ground elements of a modern building on the broch mound and the post-and-wire fences to allow for their maintenance. The scheduling excludes the sea defences that lie immediately beyond the S boundary of the scheduled area. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; Although the broch has partially collapsed and has been quarried for building stone, its remains are now in stable condition. It is very probable that substantial buried remains of the broch's lower courses, including walls and galleries, lie preserved beneath the ground surface. Descriptions in the 19th century refer to the discovery of underground passages, though no internal features can now be seen. Future archaeological investigation of buried remains may allow researchers to record the foundations and lower courses of the broch and to examine layers formed during its occupation. The buried remains have considerable potential to enhance understanding of the use and function of brochs and the daily lives of the people who occupied them. There is potential for artefacts and ecofacts that may illuminate the diet, economy and social status of the broch builders and occupants, and the extent to which this varied over time. There is potential to date construction of the broch and to compare this with the date of the rampart defences. Although the outer rampart is only clearly visible above ground to the south, slight undulations on the seaward (north) side of the broch suggest that further buried remains of the rampart may survive below ground level. Tradition suggests that this promontory was also the site of a medieval chapel. On the W side of the broch, in the supposed location of the chapel, a low bank extends ESE-WNW for 16.5m and a second bank runs southwards for 10m from its W end, terminating at a coastal erosion scar. It is possible that these remains relate to the chapel and that its foundations also survive as buried archaeological features. Contextual characteristics; This broch is one of over 130 brochs known in Shetland. It has the potential to enhance our understanding of the relationship between brochs, the extent to which they were contemporary, and their relationship with other contemporary settlement types and with the wider landscape. Brochs have been viewed as having a defensive or offensive function, or simply as being the prestige dwellings of an elite keen to display its status. The buried remains at Burra Voe have high potential to help address these questions and may provide insights into the nature and use of these structures and the landscape immediately around them. There is also potential for this monument to contribute to our understanding of how broch sites might be reused in later periods. There is a tradition of a chapel here and this site can be compared with others where chapels appear to have been placed near former brochs, as perhaps at Nesti Voe, where an early Christian chapel was erected just across the Sound of Noss from a former broch. Associative characteristics; The broch is depicted on the Ordnance Survey first edition map and labelled 'Brough, Site of'. A letter of Thomas Matthewson, a Shetland antiquarian of the late 19th century, records the local tradition that the church of Burravoe stood at the site of the broch. Researchers who visited the site in 1999 found that local people continue to believe that a chapel stood immediately west of the broch. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular of Iron Age Shetland and the role and function of brochs. The monument offers high potential to study the relationship between the broch, its rampart, and a putative chapel suggested by historical sources. The loss of the monument would significantly diminish our future ability to appreciate and understand the development and use of brochs in the Shetland Islands.

Asset/Event Number	4
Asset/Event Name	Infield, broch 215m SE of
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM2058
HER Number	1228
Status	Scheduled Monument
Easting	445370
Northing	1174725
Parish	Delting
Council	Shetland Islands
Description	The monument comprises a broch of Iron Age date, built probably between 500 BC and AD 200, as well as the remains of a later storehouse and an operational lighthouse dating to 1909. The broch is visible as a small-mounded promontory which has been largely sealed by concrete capping, forming a pad for the lighthouse and a sea defence barrier. The masonry structure of the broch is partly visible in exposed sections. The broch and its associated remains cover an area approximately 20m in diameter. It lies above the high water mark, on a rocky promontory overlooking Firths Voe with views northeast towards Yell. The monument was first scheduled in 1934 but the documentation does not meet modern standards; the present rescheduling rectifies this. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The seaward limit of the scheduled area is defined by the mean high water spring mark. The scheduled area specifically excludes the above-ground remains of: the storehouse, all concrete ground works, the lighthouse, modern services and modern boundary features, to allow for their maintenance. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The broch survives as a low-mounded earthwork and masonry structure which has been partly sealed by later concrete works. There is no further evidence of significant intrusion and so much of the structural ground plan and lower courses, as well as occupation evidence, are likely to survive beneath the modern surface. Areas of masonry are exposed on the north and south arcs, indicating the structural integrity beneath. On the south arc the exposure reveals a lintelled entrance to a mural cell. In addition, previous fieldworkers have found pottery sherds at the east side of the broch. Taken together, these remains indicate high potential for the survival of artefacts, ecofacts and structural remains. The land immediately surrounding the broch may contain significant structural remains of associated outer buildings and agricultural land use, which can help us piece together the wider picture of settlement here, and the social, economic and environmental circumstances surrounding the broch's construction, use and abandonment. Contextual characteristics; This broch is one of over 130 known in Shetland. Brochs are a particularly distinctive type of Iron Age roundhouse structure and are likely to have served a variety of functions. While a domestic and agricultural function has been inferred from the evidence of excavated brochs elsewhere, researchers have also considered the symbolic and strategic significance of these buildings, their outworks and their position in the surrounding landscape. This example occupies a sentinel position along the northeast coast of the Shetland mainland and, like the majority of examples in the Northern Isles, it seems equally able to exploit landward and seaward resources, while acting as a visible waypoint or prestigious coastal mark. It therefore has the ability to tell us much more about broch architecture, the function and relative status of these structures and the wider division and exploitation of natural resources. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular the Iron Age occupation of Shetland and the role and function of brochs. The survival or structural and artefactual material from the various phases of the broch's development can help us understand more about the lifestyles of the people occupying this type of monument and something of their pattern of activities. Its loss would significantly diminish our future ability to appreciate and understand this class of monument and the wider Iron Age landscape of Scotland.

Asset/Event Number	5
Asset/Event Name	Head of Brough, broch, West Yell
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM2071
HER Number	1246
Status	Scheduled Monument
Easting	444644
Northing	1184948
Parish	Yell
Council	Shetland Islands
Description	The monument comprises the remains of an Iron Age defended settlement, a broch, with external defences. It was scheduled in 1934, but this did not include all of the outer works, hence this extension. The broch is reduced to a mound on the SW side of which part of the outer face of the broch can be discerned, suggesting an overall diameter of about 18m. A ditch, 1m deep with low banks of upcast material or, less likely, dump ramparts on either side, curves around the broch mound on the N and E, with its inner bank some 15m from the broch. Due E of the broch this ditch is crossed by a causeway, but this may be contemporary with the much later croft ruins which overlie part of the site. The ditch seems to be absent to the S of the broch, and on the W the coastline, of shelving rocks, comes to within 20m of the broch. The area now to be scheduled is a circle 65m in diameter, centred on the E edge of the broch mound, to include the broch, its outer ditch and associated banks and the ruins of the croft buildings overlying the broch, together with an area between and around these remains in which evidence relating to the history of the site's use may survive.

Asset/Event Number	6
Asset/Event Name	Fugla Ness,broch 330m NNW of
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM2080
HER Number	1224
Status	Scheduled Monument
Easting	443745
Northing	1177715
Parish	Delting
Council	Shetland Islands
Description	The monument consists of the remains of an Iron Age broch, with outer buildings, protected to the landward by a double bank and ditch. The broch survives within a mound of rubble to a height of at least 2m, and on the seawrd side may be seen the upper part of the entrance passage and the tops of two flanking cells, which have been dug into at some time. To the immediate S of the broch mound are the remains of a substantial sub-rectangular building, possibly of similar date, and slight traces around the mound suggest that other building foundations may lie nearby. The broch and these other remains lie on a flat platform, cut off from the landward side by a deep ditch and double bank, made of earth and rubble. The sea

has encroached upon the site to the E, and the outer face of the broch is beginning to be undermined. The area to be scheduled is irregular in plan, bounded on the E by the top of a low sea cliff and on the other sides by a line 10m outside the outside foot of the outer of the two defensive banks, as shown in red on the accompanying map. The monument is of national importance as a fine example of a broch with outer defences. Of particular importance is the sub-rectangular outer building, which may be of a late Iron Age date. Such buildings occur at a number of northern broch sites, and may represent a little-studied category of 'Pictish' dwelling.

Asset/Event Number	7
Asset/Event Name	Holm of Copister, broch 850m SW of Southerness
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM2091
HER Number	1216
Status	Scheduled Monument
Easting	447210
Northing	1178007
Parish	Yell
Council	Shetland Islands
Description	The monument comprises a broch of Iron Age date, built probably between 500 BC and AD 200, and the remains of two outer defences. The broch is visible as a grassy mound standing 6m high. The base of the wall is visible on the E side, while on the W side part of an upper gallery, 0.9m wide, is visible within the wall at the wall head. The wall is here 3.1m thick and the broch has an overall diameter of 18.15m. The broch is surrounded by a rampart 1.4m - 1.8m high. The interior of the broch is faced with stone and is near vertical where exposed on the NW and SE sides; the outer face is battered. The rampart has a maximum thickness of 4.7m at the base. On the NW side of the broch, which is the lowest part of the island and facing Yell, an additional ditch and bank lie outside the rampart. The broch and its outworks occupy almost the whole of the small island known as the Holm of Copister. The island is 150m from the S shore of Yell at high tide, but at low tide the channel is less than 20m wide. The monument lies less than 10m above sea level, towards the E side of the sound that separates Mainland and Yell. The monument was first scheduled in 1934 but the documentation does not meet modern standards; the present rescheduling rectifies this. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The scheduled area extends to the mean low water mark of the Holm of Copister. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; Although the broch has partially collapsed, the surviving mound is in good condition. It is highly probable that substantial buried remains of the broch's lower courses, including walls and galleries, are preserved beneath the tumble that forms the mound. Part of a mural stair was traceable in 1890. The earthwork defences suggest further complexity, and there is potential that these defences were used before or after the primary occupation of the broch tower. On the E side, the rampart and the broch wall are connected by a grassy bank that has evidence for coursed masonry at the base of both sides. The rampart lies about 10m from the base of the broch mound. Within the N side of this enclosure, there is a large stone set on end and a short stretch of walling, both of which may be of similar date to the broch. In the same enclosure to the NW of the broch are the foundations of a later rectangular stone building. Beyond the rampart on the NW side there is a ditch about 4.5m wide, narrowest to the N where it is cut through the rock, and beyond that is an upcast bank about 2.7m wide that rises 1.2m above the base of the ditch. It is clear that buried archaeological deposits exist that can enhance our understanding of both the broch and the external defences. Future investigation may allow future researchers to date the construction

of the broch, and to compare this with the dates of the rampart defences and other structures. In addition, the buried remains have considerable potential to enhance understanding of the use and function of brochs and the daily lives of the people who occupied them. There is high potential for the survival of artefacts and ecofacts that may illuminate the diet, economy and social status of the occupants, and the extent to which this varied over time. Although the sound between the island and Yell carries fast-flowing water at high tide, it is possible that access to the broch was available by foot at low tide and there is potential for the remains of a causeway to survive. Contextual characteristics; This broch is one of over 130 known in Shetland. It has the potential to enhance our understanding of the relationship between brochs, the extent to which they were contemporary, and their relationship with other contemporary settlement types and the wider landscape. Brochs have been viewed as having a defensive or offensive function, or simply as being the prestige dwellings of an elite keen to display its status. The buried remains here have high potential to help address these questions and may provide insight into the nature and use of these structures and the landscape immediately around them. There is considerable potential to compare the outer defences to those of many other brochs, for example, those at Burland and Underhoull. Associative characteristics; The monument is depicted on the Ordnance Survey first edition map and is labelled 'Brough'. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular of Iron Age Shetland and the role and function of brochs. The monument offers potential to study the relationship between the broch, two outer defences, and other structures enclosed within the defences. The loss of the monument would significantly diminish our future ability to appreciate and understand the development and use of brochs in Shetland.

Asset/Event Number	8
Asset/Event Name	Giant's Grave, standing stones and cairn, Beorgs of Housetter
Type of Asset/Event	Standing Stones and Cairn
Date and/or Period	Neolithic
Listing No./NRHE Number	SM2200
HER Number	843
Status	Scheduled Monument
Easting	436168
Northing	1185459
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises two standing stones and the remains of a cairn of the Neolithic period, built probably between 4000 and 2500 BC. The two standing stones are both rough undressed blocks of red granite. They are 5.5m apart and aligned N-S. The southernmost stone is the larger of the two and stands 2.45m high; the northernmost stands 2m high. Packing stones are visible around the bases of both standing stones. Between the standing stones, a row of facing stones defines the E-facing concave façade of a probable heel-shaped cairn. The cairn is visible as a low spread of stones, with a large central capstone collapsed in situ which may be obscuring the chamber. The cairn measures around 7m E-W by 6m transversely, while the E-facing façade is up to 8m wide with a slightly off-centre entrance to the passage. The largest boulders occur in the façade, with smaller stones forming the kerbing around the sides and back of the cairn. The cairn stands at around 30m above sea level on a gentle slope at the base of the steep-sided slope of the Beorgs of Housetter and overlooks the Loch of Housetter 150m to the east. The monument was first scheduled in 1962, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is a circle, 25m in diameter, centred on the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map.

The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument is in a stable condition and retains much of its original form. The standing stones are erect and in good condition. The packing stones at the base of both stones would have helped to keep them upright and indicate that the monoliths were placed in pits when first erected. Archaeological deposits are likely to survive in buried horizons around and at the base of the stones. The monument retains a number of interesting features, including the curving line of the façade, the large capstone and, most significantly, the incorporation of two standing stones within the structure of a chambered cairn. The cairn façade curves outwards to form the traditional 'horns' of a heel-shaped cairn, but is highly unusual in terminating in the two standing stones, which would have considerably increased the original visual impact of the façade. Standing stones are rarely incorporated into chambered cairns: Giants Grave therefore offers a rare potential opportunity to understand the development sequence between cairns and standing stones. Chambered cairns are Neolithic in origin, dating most commonly from the third and fourth millennia BC. Excavation elsewhere suggests that they were used over a lengthy period and housed the remains of multiple individuals. Despite the removal of stone from this cairn, significant archaeological information is likely to survive beneath its surface. The presence of a large capstone could indicate that the main burial chamber is still intact. The excavation of similar sites elsewhere in Scotland shows that cairns might be adapted over time and might also form a focus for burial in later periods. Buried deposits associated with cairns can help us to understand more about the practice and significance of burial and commemorating the dead at specific periods in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried ground surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains, including pollen or charred plant material, may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us to build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the standing stones and cairn. Contextual characteristics; Standing stones are widespread in Scotland, demonstrating that prehistoric people occupied much of the country, stretching from the south and southwest to the Northern Isles. Standing stones are often part of a wider system of monuments, such as henges, stone circles and cairns, though rarely as directly as in this case. Standing stones often take advantage of natural routeways and vantage points; in this case, there are impressive views from the stones towards the south and east. Heel-shaped cairns are a rare and distinctive form of chambered cairn found in the Shetland Islands. They share several traits with prehistoric houses in Shetland, especially their elaborate well-built façades. The large prehistoric house at Stanydale, often referred to as a 'temple', has a very similar heel-shaped façade. Heel-shaped cairns are believed to be a variation of the 'Orkney Cromarty' cairn type, as identified by Henshall, but their size is typically much smaller. This monument is also of particular interest because it is located in a landscape rich in prehistoric monuments, including other cairns. There are other cairns 75m to the NNE and 130m to the W. Across Scotland cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this cairn in relation to contemporary agricultural land and settlement is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to further our understanding not only of funerary site location and practice, but also of the structure of early prehistoric society and economy. Associative characteristics; Like many of Shetland's prehistoric monuments this cairn has become the focus of local legends. This cairn is known as the 'Giant's Grave' because it is supposed to mark the spot of a giant's burial. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of cairns, the relationship between standing stones and burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge of wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it lies in a landscape with a wealth of prehistoric monuments. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death, burial and ritual practices in prehistoric times.

Asset/Event Number	9
Asset/Event Name	Chapel Knowe, earthworks, church and graves 40m WNW of Lunna Church
Type of Asset/Event	Earthworks, Church and Graves
Date and/or Period	Iron Age / Early Medieval
Listing No./NRHE Number	SM2691
HER Number	1194
Status	Scheduled Monument
Easting	448560
Northing	1169108
Parish	Nesting
Council	Shetland Islands
Description	The monument consists of the remains of a rampart enclosing the summit of Chapel Knowe, the foundations of two rectangular buildings on the knowe, seven low oval mounds S of the knowe, and other remains lying close to these features. The rampart banks may be Iron Age in date (about 800 BC - AD 400), but at least one of the rectangular structures is probably a medieval church building, potentially sited on an earlier church built between AD 400-1200. Local tradition describes the site as a monastery. The grassy mounds are oval in shape and resemble pagan Norse graves from Scandinavia dating to around AD 800-1000. The monument lies on a long peninsula projecting from the NE coast of mainland and is sited on a low rise 10m above sea level, at a point where the peninsula narrows to only 200m in width. The rampart and buildings were first scheduled in 1968 and rescheduled in 2000, whereas the mounds to the S were first scheduled in 1995. The present rescheduling includes both groups of features and brings the documentation up to modern standards. The enclosure banks are visible as an earth and stone rampart, spread to around 2m wide and standing up to 1m high, intermittently surrounding a sub-circular area around 36m in diameter. There is an apparent entrance about 6.5m wide on the ENE side. Within the enclosure banks on the NW side are the stone foundations of a rectangular building measuring 8.5m E-W by 3.9m transversely. An entrance 0.9m wide is centrally positioned in the W wall. The low, turf-covered foundations of a second rectangular structure are visible abutting the outside of the rampart 25m to the S. This structure is longer and narrower, measuring at least 16.5m ESE-WNW by 3.5m transversely. It appears to have a rounded E end located immediately beyond a cross wall. Other potential structures lie within and on the perimeter of the enclosure bank. The oval mounds lie between 15m and 60m from the enclosure, to the SE and S. One lies to the N of Lunna Church and measures 4.2m by 3.4m by 0.4m high; three lie on the lower S slope of Chapel Knowe and measure 7.1m by 4.7m by 1.5m high, 4.5m by 3.6m by 0.5m high, and 3.2m by 2.4m by 0.5m high; and three lie further SW, down a step on the sloping hillside, and measure 7.8m by 4.8m by 0.8m high, 4.8m by 4.4m by 0.2m high, and 6.5m by 5.8m by 0.7m high. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The scheduling specifically excludes the above-ground elements of all modern walls to allow for their maintenance. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The upstanding earthworks survive in excellent condition and suggest a long and complex development sequence. Several objects are reported to have been found around the structures on the knowe, including Iron Age pottery, a steatite spindle whorl and a broken font. These confirm the use of the site over an extended period and give a strong indication that very significant buried archaeological deposits exist below the ground surface. The monument may potentially preserve, at a single location, remains of a prehistoric settlement, early historic settlement and church, pagan Norse cemetery and medieval church. The curved bank that bounds the N and W sides of the knowe has high potential to be part of an Iron Age broch some 20m in diameter. The bank has not been dated, but its form, dimensions and landscape position are indicative of a broch. Other banks to the E and S may be ramparts enclosing outer yards, or may derive from later use of the site. The rectangular stone structure within the bank resembles a medieval church. This may be the 'foundation of the old church of the parish' noted in 1863, a structure probably superseded by the present Lunna Church which stands

70m to the SE. Although Lunna Church dates from 1753, it may itself include earlier fabric, so it is unclear when 'the old church of the parish' would have passed out of use. Although the visible remains probably belong to a building constructed after about 1200, researchers suggest remains of an earlier church building may survive below ground. The second rectangular structure has a rounded east end but its proportions perhaps resemble a Norse longhouse rather than an ecclesiastical building. A circular hollow about 5.5m in diameter and 1.4m deep, possibly a kiln, lies at the W end of the structure and may be associated with it. The oval mounds to the SE and S have not been excavated; their identification as Norse burial mounds rests on their similarity to features known from Scandinavia. There is potential to examine in detail the chronological relationship between prehistoric activity, the first ecclesiastical use of the site, probable use of the site by the Norse and construction of the medieval church, exploring issues such as the duration of occupation, the extent to which occupation of the site was continuous and the nature of abandonment processes. The buried remains have considerable potential to enhance understanding of the form, use and function of the upstanding rampart banks and of the daily lives of the people who lived within them. There is high potential for the recovery of artefacts and ecofacts that may illuminate the diet, economy and social status of the occupants and the extent to which this varied over time. It is probable that many burials remain in situ, with potential to reveal changes in burial practice and to enhance our knowledge of status, health, diet, illness, cause of death, and perhaps the geographic origin of the buried people. There is also potential to examine the origin and development of an early church. Contextual characteristics; The monument is rare because it preserves upstanding remains deriving from a long sequence of activity in one location, potentially including prehistoric settlement, pagan Norse graves and a medieval church. Groups of upstanding Norse burial mounds are very unusual outside Scandinavia. Researchers also suggest the site may contain buried remains of an early Christian church. Such structures are rare in Shetland as in other parts of Scotland, but this monument can be compared with the churches at St Ninian's Isle off the W coast of South Mainland and at Nesti Voe on Noss, lying off the E coast of Bressay. The monument can also be compared with a variety of archaeological sites in the vicinity, including burnt mounds sited 360m and 690m to the NNW, prehistoric settlements located 3.2km SE and 2.9 km WNW, and a possible broch that lies at the head of Vidlin Voe, 3.7km to the S. These sites enhance the importance of this monument by increasing our knowledge of the surrounding prehistoric landscape. Associative characteristics; Chapel Knowe is known in local tradition as the site of a monastery. The site is marked 'Chapel Knowe' and 'Monastery (Site of)' on the Ordnance Survey first edition map. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular of late prehistoric settlement, and early historic and medieval ecclesiastical sites in the British Isles. It has well-preserved archaeology, giving excellent potential to provide information about the early historic and medieval church in Shetland and the relationship between Christian and Norse peoples. The monument potentially includes a rare surviving group of pagan Norse graves, which would give it international significance in enhancing understanding of the date and nature of Viking settlements in the North Atlantic area. The loss of the monument would significantly diminish our future ability to appreciate and understand the continued use of high status sites over an extended time period.

Asset/Event Number	10
Asset/Event Name	Collafirth Ness, house 150m S of Noness Head
Type of Asset/Event	House
Date and/or Period	Neolithic / Bronze Age
Listing No./NRHE Number	SM3465
HER Number	1229
Status	Scheduled Monument
Easting	445828
Northing	1170192

Parish	Nesting
Council	Shetland Islands
Description	A probable Neolithic/Bronze Age homestead as described by Henshall and illustrated by the RCAHM. There is no evidence to indicate the chamber of a cairn; the cist-like construction, situated on the NW margin of the feature is almost certainly intrusive. Too amorphous to positively classify.

Asset/Event Number	11
Asset/Event Name	Burravoe, chambered cairn & cairn 470m NE of, Brae
Type of Asset/Event	Prehistoric ritual and funerary: cairn (type uncertain); chambered cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3469
HER Number	777
Status	Scheduled Monument
Easting	436397
Northing	1167396
Parish	Delting
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	12
Asset/Event Name	Orbister, prehistoric house 230m SSE of
Type of Asset/Event	House
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3471
HER Number	818
Status	Scheduled Monument
Easting	431259
Northing	1176649
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises an oval prehistoric house, adjoined by a curving wall and orthostat possibly representing the remains of an enclosure. The house is approximately 12m in diameter overall, with turf-covered walls up to 2.7m wide. The curvilinear wall extends from the NW arc of the house over a distance of 25m, and terminates in a 1m high orthostat. The monument is believed to be late Neolithic or Bronze Age in date, probably from around 3000 to 1000 BC. It is located on sloping ground at around 10m above sea level, close to the shore at the head of Hamar Voe, an arm of Ura Firth. The monument was originally scheduled in 1975 but the scheduled area was inadequate and the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is irregular on plan to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The scheduling specifically excludes a water pipeline and concrete

marker, as well as the above-ground elements of all post-and-wire fencing to allow for their maintenance. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The oval house is in stable condition, although much denuded of stone. It is visible as an inner and outer kerb of stones enclosing a turf-covered interior, with the wall best preserved on the W side. No entrance is discernible. On the NW side of the house, the curving line of stones terminating in an orthostat is likely to represent an enclosure, suggesting that this was a homestead with a yard. Alternatively, it may be the remains of a field wall or, conceivably, of a second building. There is potential for the buried elements of this site to contain important archaeological deposits, including artefacts, ecofacts and other environmental evidence, which could help to further our understanding prehistoric domestic life and agricultural activity. Examination of building foundations can provide detailed information about the form and construction of prehistoric houses in Shetland, and buried features in the interior can contribute to our understanding of how houses were used and organised, and how this might change over time. Buried artefacts, ecofacts and soils can contribute to our understanding of how people lived and worked, and provide insights into trade and exchange and the nature of the agricultural economy. Archaeological investigation at similar sites has yielded high quality artefactual and ecofactual material, which can help us to build up a much fuller picture of prehistoric domestic life. There is also the potential to compare the house with the adjacent wall to determine the relationship between these features, and to ascertain how the inhabitants managed the landscape in the immediate vicinity of the house. Contextual characteristics; This is a relatively well-preserved prehistoric house and shares characteristics with a number of broadly similar prehistoric houses in Shetland that also have evidence of adjoining buildings or enclosures. As such, this example characterises early settlement and the development of agriculture in the third to second millennium BC in Shetland. It is part of a relatively rare and geographically restricted group, which gives us a more balanced view of prehistoric life, when compared with the more common and widespread burial and ceremonial monuments of the later Neolithic elsewhere in Scotland. The monument's situation within the landscape further enhances its importance. Immediately outwith the scheduled area there is evidence for a field system, including a later dyke and a planticrub which may overlie other prehistoric remains. A burnt mound is located approximately 100m to the NW. Later prehistoric features in the area include a broch 260m to the NW. This monument is clearly an important element of a much wider relict landscape that testifies to early human efforts to exploit land and natural resources, in particular for agricultural production, over several millennia. Comparison of this site with the other prehistoric domestic remains in the area would help us to further our understanding of prehistoric domestic life and landuse. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular, the nature of prehistoric settlement, agriculture and landuse in Shetland. It has the potential to improve our understanding of the distribution of settlement, the structural techniques used to build houses and changes in settlement over time. There is also excellent potential to study how this site fitted into a landscape rich in prehistoric remains. The loss of this monument would impede our ability to understand the nature of prehistoric domestic architecture and settlement, both in Shetland and Scotland.

Asset/Event Number	13
Asset/Event Name	Orbister House, burnt mound 155m ESE of
Type of Asset/Event	Burnt Mound
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3472
HER Number	816
Status	Scheduled Monument
Easting	431226
Northing	1176753
Parish	Northmaven

Council	Shetland Islands
Description	No Description Available

Asset/Event Number	14
Asset/Event Name	Isleburgh, prehistoric house and enclosures 760m SSW of
Type of Asset/Event	House and Enclosure
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3486
HER Number	787
Status	Scheduled Monument
Easting	433346
Northing	1168486
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises a prehistoric house within an enclosure and an associated field system. The house dates probably from the Neolithic period or Bronze Age, some time between about 4000 and 1500 BC. The house is visible as an upstanding sub-circular feature, formed mainly by turf banks. It measures around 15m N-S by 14m E-W and has an entrance in the south. An annex or yard to the south of the house measures 7m N-S by 11m E-W. A later stone-built plantiecrub overlies the central and southern portion of the house. The house lies within a substantial stone-built semi-circular enclosure that is bounded by the voe to the south. The enclosed area is some 70m NE-SW by 60m NW-SE and includes about 0.3ha of land. The enclosure wall includes some very large stones, up to 1m high, and the overall bank of the enclosure is between 2-3m wide. A prehistoric field lies northwest of the enclosure and is defined by a series of evenly spaced boulders. It is roughly circular in shape, 40m in diameter, and encloses an area of 0.12ha. The monument lies about 5m above sea level on a gentle south-facing slope, just north of the coastline at Holm of Culsetter. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument survives in reasonably good condition, below closely cropped grass. The sub-circular house is represented on the ground by a stone wall and turf bank around its north side and a turf bank around the south. The house site was partially excavated in the late 1950s. Its northern section and part of the area within the later plantiecrub were excavated to a depth of 0.75m, but the paved stone flooring and a drain were left in situ, suggesting that archaeological evidence is likely to be present even in the excavated areas. A prehistoric trough quern was observed lying on the ground surface next to the house. Significant buried archaeological remains can be expected to survive beneath and around the visible upstanding structures. The house offers potential for researchers to examine foundations, floor surfaces and associated pits and middens and can improve our understanding of how prehistoric houses were designed, constructed and used. The buried remains may include artefacts and ecofacts that can help us understand how the inhabitants lived, farmed and used the natural environment, and can tell us about the trade and exchange of goods with other groups. Researchers may be able to date the buried remains and determine whether occupation of the site was interrupted by one or more periods of disuse. There is also potential to compare the house building with the field system and the stone enclosure to determine whether all of these features are contemporary, and to ascertain how the inhabitants managed the landscape in the vicinity of the house. There is high potential to determine when and how the field system developed, how it was used and whether the soils were improved. Contextual characteristics; This monument lies within a landscape that is exceptionally rich in prehistoric archaeological remains and its importance is enhanced because it can be compared with several nearby sites. There is a cairn 125m to the ESE, and

two further prehistoric houses, 1.3km to the north and 900m to the south. Across Scotland cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this prehistoric settlement and farmland in relation to the cairn is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to contribute to our understanding not just of this settlement and its location within the landscape, but also of the structure of early prehistoric society and economy. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, in particular of prehistoric settlement and land use in Shetland. It has the potential to improve our understanding of the distribution of settlement, the structural techniques used to build houses, changes in the nature of settlement over time, and the relationship between houses and other features, such as field systems and cairns. The loss of the monument would significantly diminish our future ability to appreciate and understand prehistoric settlement and land use in Shetland.

Asset/Event Number	15
Asset/Event Name	Islesburgh, prehistoric houses 560m and 685m NNW of
Type of Asset/Event	Houses
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3487
HER Number	789
Status	Scheduled Monument
Easting	433305
Northing	1169800
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises the remains of a cluster of four prehistoric houses, each visible as a roughly oval bank of turf and stones with a hollow centre. The houses are believed to be late Neolithic or Bronze Age in date, around 3000 to 1000 BC. The southernmost house is approximately 10m N-S by 8m transversely, but has been partly eroded by the sea. Another house lies around 100m to the NW. It measures 11m NE-SW by 9m transversely and is cut into the slope. The two largest and best preserved houses lie a further 60m to the NW and are only 20m apart from each other. They are also cut into the slope. They measure 14m by 10m and 12m by 10m respectively, with their longer axis E-W. Both consist of low footings of turf and stone and have E-facing entrances. The houses are located on semi-improved grassland on the gently sloping western bank of Mangaster Voe, at around 10m above sea level. The monument was originally scheduled in 1974 but the area was inadequate and the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is in two parts, 80m apart. The first includes the remains of the southernmost house and is circular in plan, 30m in diameter, and clipped by the shore. The second includes the other three houses and is rectilinear in shape, measuring approximately 90m NNW-SSE by 88m transversely. The areas include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The prehistoric houses survive in reasonably good condition overall: the form of the houses is visible and sections of stone wall-facing protrude through the turf in places. The site is likely to contain important buried deposits, including artefacts, ecofacts and other environmental evidence. Examination of the building foundations can give us detailed information about the form and construction of prehistoric houses, while buried features within their interiors can contribute to our understanding of how houses were used and how this changed over time. Buried artefacts and ecofacts and buried soils can contribute to our understanding of how people lived and worked, and allow us to improve our understanding of prehistoric trade and exchange and the nature of the agricultural economy. Archaeological

	investigation at similar sites has yielded high quality artefactual and ecofactual material, which can help us to build up a much fuller picture of prehistoric domestic life. Contextual characteristics; The houses in this group are good examples of a number of broadly similar prehistoric houses that characterise early settlement and the development of agriculture in the third to second millennium BC in Shetland. They are part of a relatively rare and geographically restricted group, which gives us a more balanced view of prehistoric life when compared with the more common and widespread burial and ceremonial monuments of the later Neolithic elsewhere in Scotland. The house lies in close proximity to other broadly contemporary monuments: two other prehistoric houses lie approximately 360m to the NW and another prehistoric house is located 1.3km to the south. This monument is an important element of a much wider relict landscape and it testifies to early human efforts to exploit land and natural resources for agricultural production. There can be an impressive time-depth to these early houses, as may well be the case here, which can tell us much about change and continuity over long periods. Comparison of this site with the other prehistoric domestic remains in the area could help us to develop a better understanding of prehistoric domestic life and landuse. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular, the nature of prehistoric settlement, agriculture and landuse in Shetland. It has the potential to improve our understanding of the distribution of settlement, the structural techniques used to build houses and changes in the nature of settlement over time. There is also excellent potential to study how this site fitted into a landscape that is rich in prehistoric remains. The loss of this monument would impede our ability to understand the nature of prehistoric domestic architecture and settlement, both in Shetland and Scotland.

Asset/Event Number	16
Asset/Event Name	Graven, chambered cairn 650m SW of
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3524
HER Number	1232
Status	Scheduled Monument
Easting	440502
Northing	1172718
Parish	Delting
Council	Shetland Islands
Description	A probable round chambered cairn, known as 'Meshie o' Stanes'. It is composed of large round boulders and stands about 5' above the moor, but is really much larger as the peat has grown round it to a depth of at least 3'. It is otherwise clear of vegetation. It appears to be circular with a diameter of about 35', without any sign of kerb or walling or of an entrance passage.A little south of the centre is exposed a small rectangular chamber 5 ft. long by 3 ft. 4 ins. maximum width and depth. Below the stone forming the SW angle of the chamber is a space which may be the inner end of a passage.

Asset/Event Number	17
Asset/Event Name	Lunna, burnt mound 230m W of
Type of Asset/Event	Burnt Mound
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3551

HER Number	1192
Status	Scheduled Monument
Easting	448461
Northing	1169461
Parish	Nesting
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	18
Asset/Event Name	Lunna, two burnt mounds 400m NW of
Type of Asset/Event	Burnt Mounds
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3555
HER Number	1188
Status	Scheduled Monument
Easting	448421
Northing	1169796
Parish	Nesting
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	19
Asset/Event Name	Auchensalt, burnt mound 85m E of
Type of Asset/Event	Burnt Mound
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3556
HER Number	1222
Status	Scheduled Monument
Easting	443712
Northing	1176986
Parish	Delting
Council	Shetland Islands
Description	The monument comprises the remains of a substantial burnt mound, visible as an approximately crescent-shaped earthwork some 10m in overall diameter and standing 1.5m high. The burnt mound is likelt to date to between 2000 and 1000 BC. The monument is located at around 30m above sea level, on grazing land which slopes to the east and overlooks Tofts Voe and Yell to the northeast. In the immediate vicinity are the ruined remains of a small croft to the east and an artificial watercourse to the west. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan, measuring 20m in diameter, centred on the centre of the monument. The scheduling includes the remains described above and an

area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument survives as an upstanding, turf-covered earthwork in good overall condition, despite some intrusion and disturbance by burrowing animals. Soil poaching in places has exposed some of the underlying burnt and fire-cracked stones of which the mound is mainly composed. A central depression separates the northern and southern 'arms' of the mound, with the latter being substantially smaller than the former. The two parts of the mound are conjoined by a bank on the west side of the monument. Burnt mounds are made from heaps of burnt and fire-cracked stone, occurring usually within a matrix of dark soil and perhaps charcoal or ash. The crescent shape is formed as discarded material accumulates around a central area, which is normally where the water-heating activities took place. The stones represent the waste product from the use of hot stones to heat water, probably for a variety of purposes. After several immersions, the stones would crack and break and were discarded to form burnt mounds. Burnt mounds are often accompanied by troughs that held the water and there is sometimes evidence for associated shelters and the hearths in which the stones were heated. Troughs are usually set in the ground and lined with wood, stone or clay. Burnt mounds typically lie close to a stream or other water source. The monument has good potential to inform our understanding of the date and nature of burnt mounds, their function(s) and duration. It and the immediately surrounding ground may contain artefacts or ecofacts that can increase our understanding of what burnt mounds were for and how they were used. The mound may also have accumulated directly on an old ground surface and may seal important environmental information that could increase our knowledge of the landscape and land-use before and during the mound's creation. Contextual characteristics; There are around 1,900 recorded examples of burnt mounds in Scotland with notable concentrations in some areas, including Shetland. However, these concentrations largely correlate with surveyed areas and may not reflect the true distribution of burnt mounds. The concentration in Shetland may also reflect survival because of a lack of later development or agricultural improvement. Burnt mounds in the Northern and Western Isles and in the north of mainland Scotland are often particularly large. They often show the classic crescentic shape and may have been reused on many occasions over a significant period. They may also have served different social and practical functions to smaller mounds. In Scotland, excavated examples typically date to the middle Bronze Age, around 1500 BC, but the overall range of dates varies from the late Neolithic through to the early historic period (around 2400 BC to AD 900). A common interpretation of these monuments in Scotland is that they were used to boil water for cooking. However, researchers have also suggested that they could have been used as saunas or sweat-lodges (possibly medicinal as well as sanitary); as baths; or for textile production (dying and fulling), brewing or leather working. Burnt mounds are often found in relatively isolated locations in Scotland, but in Shetland they sometimes occur in association with settlement remains. The proximity of this example to a second burnt mound just 100m to the southeast is interesting when compared with the single, isolated examples more common elsewhere. These monuments do not survive (and are not likely to have been used) in isolation, but were and are part of a wider contemporary landscape of settlement and land-use. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular prehistoric society and the construction and use of burnt mounds, and their placing in the landscape. The good preservation of the monument and its proximity to a second burnt mound, 100m to the southeast, enhance this potential. The loss of this monument would impede our ability to understand the nature of later prehistoric domestic and ritual practice, both in Shetland and in Scotland.

Asset/Event Number	20
Asset/Event Name	Norden, burnt mound 160m ESE of
Type of Asset/Event	Burnt Mound
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3557

HER Number	1223
Status	Scheduled Monument
Easting	443771
Northing	1176901
Parish	Delting
Council	Shetland Islands
Description	The monument comprises the remains of a substantial burnt mound, visible as a crescent-shaped earthwork about 10m in overall diameter and standing up to 1.5m high. The burnt mound is most likely to date to between 2000 BC and 1000 BC. The monument is located at around 20m above sea level, on grazing land which slopes eastwards and overlooks Tofts Voe and Yell to the northeast. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan, measuring 25m in diameter, centred on the centre of the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. Specifically excluded from this scheduling are the above-ground elements of a post-and-wire fence to the immediate east of the monument, to allow for its maintenance. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument survives as an upstanding, turf-covered earthwork in good overall condition, despite some intrusion and disturbance by burrowing animals. Soil poaching in places has exposed some of the underlying burnt and fire-cracked stones. This mound was formed from two roughly similar discard mounds on either side of a central depression.Burnt mounds are made from the waste products (stones) used to heat water probably for a variety of purposes. The crescent shape is formed as discarded material accumulates around a central area, which is normally where water-heating activities took place. Burnt mounds are often accompanied by troughs that held the water and there is sometimes evidence for associated shelters and the hearths in which the stones were heated. After several immersions, the heated stones would crack and break and were discarded to form burnt mounds. Troughs are usually set in the ground and lined with wood, stone or clay. As well as the overall form of the earthwork and its composition predominantly of burnt stones, the existence of a water source close to this mound helps to verify its function as a burnt mound.The monument has good potential to inform our understanding of the date and nature of burnt mounds, their function(s) and duration. It and the immediately surrounding ground may contain artefacts or ecofacts that can increase our understanding of what they were for and how they were used. The mound may have also accumulated directly on an old ground surface and may seal important environmental information that could increase our knowledge of the landscape and land-use before and during the mound's creation. Contextual characteristics; There are around 1,900 recorded examples of burnt mounds in Scotland with notable concentrations in some areas, including Shetland. These concentrations largely correlate with surveyed areas and may not reflect the true distribution of burnt mounds. In Shetland, for example, there has been relatively fewer and less destructive land-use pressures. This is a large example of a burnt mound and characteristic of many in Shetland, which suggests a greater level of burnt mound activity here, perhaps over a longer period of time. It may also have served different social and practical functions to smaller mounds. In Scotland, excavated examples typically date to the middle Bronze Age, around 1500 BC, but the overall range of dates varies from the late Neolithic through to the early historic period (around 2400 BC to AD 900). A common interpretation of these monuments in Scotland is that they were used to boil water for cooking. However, researchers have also suggested that they could have been used as saunas or sweat-lodges (possibly medicinal as well as sanitary); as baths; or for textile production (dying and fulling), brewing or leather working. Burnt mounds are often found in relatively isolated locations in Scotland, but in Shetland they sometimes occur in association with settlement remains. The proximity of this example to a second burnt mound just 100m to the northwest is interesting when compared with the single, isolated examples more common elsewhere. These monuments do not survive (and were not likely to have been used) in isolation, but were and are part of a wider contemporary landscape of settlement and land-use. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular prehistoric society and the construction and use of burnt mounds, and their placing in the

landscape. The good preservation of the monument and its proximity to a second burnt mound, 100m to the northwest, enhance this potential. The loss of this monument would impede our ability to understand the nature of later prehistoric domestic and ritual practice, both in Shetland and Scotland.

Asset/Event Number	21
Asset/Event Name	Ladie Hill, cairn 325m E of 1 Gossaford
Type of Asset/Event	Cairn
Date and/or Period	Neolithic / Bronze Age
Listing No./NRHE Number	SM3558
HER Number	773
Status	Scheduled Monument
Easting	436295
Northing	1168546
Parish	Delting
Council	Shetland Islands
Description	The monument is a burial cairn dating probably from the Neolithic or Bronze Age, sometime between 4000 and 1000 BC. It is visible as low, circular, turf-covered mound, with several stones protruding through the turf. The mound is 14m in diameter and stands 0.7m high. There is a shallow depression towards the centre of the cairn where traces of a central structure are visible. The remains of a later dry stone structure in a 'figure of 8' shape overlie the cairn on the SE side. The cairn stands at about 30m above sea level in improved grassland on the lower slopes of Ladie Hill. It offers views to the west over lower ground, particularly the narrow neck of land that separates the heads of Sullom Voe and Busta Voe. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan, 34m in diameter, centred on the centre of the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; Excavation suggests that round cairns were often used to cover and mark human burials and are late Neolithic or Bronze Age in origin, dating most commonly from the late third millennium BC to the early second millennium BC. Although there has been some disturbance to the centre of this cairn, much of the monument appears intact suggesting that archaeological information is likely to survive beneath its surface. One or more burials may survive, particularly as archaeologists often find burials away from the centres of cairns. The excavation of similar mounds elsewhere in Scotland shows that cairns often incorporate or overlie graves or pits containing cist settings, skeletal remains in the form of cremations or inhumations, pottery and stone tools. These deposits can help us understand more about the practice and significance of burial and commemorating the dead at different times in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried land surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains, including pollen or charred plant material, may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn, and following its abandonment. Contextual characteristics; Cairns are well represented in Shetland, but this example has particular interest because of its location close to several other cairns and its landscape position close to the heads of two large voes that link the east and west coasts of Mainland. The chambered cairn at Bays Water lies 3 km WSW of this monument and a pair of cairns, including one heel-shaped example, lie 1.1 km to the south at Hill of Burravoe. Across Scotland, cairns seem to be located in positions with good visibility and where they can themselves be seen, and they are generally inter-visible. Here, there is no line of sight to the nearby cairns,

	but the cairn is inter-visible with the massive Busta standing stone, 1.8 km to the SW on the opposite shore of Busta Voe. The position and significance of this cairn in relation to contemporary agricultural land and settlement is likely to be significant and merits future detailed analysis. Several prehistoric houses lie within 3 km of this site and have the potential to contribute to this analysis. Given the many comparable sites in the area, this monument has the potential to further our understanding not just of funerary site location and practice, but also of the structure of early prehistoric society and economy. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it is located in a landscape where there are several other cairns and settlement sites. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the rituals and importance of death and burial in prehistoric life.

Asset/Event Number	22
Asset/Event Name	Skeo Knowe, mound 200m E of Nissetter
Type of Asset/Event	Mound (ritual or funerary)
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3562
HER Number	806
Status	Scheduled Monument
Easting	435811
Northing	1177808
Parish	Northmaven
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	23
Asset/Event Name	Hill of Dale, chambered cairn
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3564
HER Number	1202
Status	Scheduled Monument
Easting	441297
Northing	1169945
Parish	Delting
Council	Shetland Islands
Description	Heel-shaped Cairn, Hill of Dale. This monument stands about 700 ft. above sea level on the summit of the ridge, known as the Hill of Dale, which overlooks the head of Dales Voe from the W.

Asset/Event Number	24
Asset/Event Name	Burraland, broch 350m SSE of
Type of Asset/Event	Broch
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3565
HER Number	832
Status	Scheduled Monument
Easting	434405
Northing	1174968
Parish	Northmaven
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	25
Asset/Event Name	Mangaster, chambered cairn 270m W of
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3566
HER Number	829
Status	Scheduled Monument
Easting	432710
Northing	1170866
Parish	Northmaven
Council	Shetland Islands
Description	The monument consists of the remains of a prehistoric chambered burial cairn. The cairn is much reduced, but sufficient remains to show it to be of typical Shetland "heel-shaped" plan, with an outer kerb of large boulders and, on the SE side, a well-built concave facade, from the centre of which a narrow passage gives access to a small burial chamber. The monument is of national importance for the evidence it contains, which would be accessible to excavation, for the development of Neolithic burial practices. In addition, the cairn may seal beneath it evidence, accessible to excavation and analysis, for contemporary land-use.

Asset/Event Number	26
Asset/Event Name	Meishie O' Stanes, two cairns 120m N of Collafirth Pier
Type of Asset/Event	Cairns
Date and/or Period	Neolithic / Bronze Age
Listing No./NRHE Number	SM3568
HER Number	856

Status	Scheduled Monument
Easting	435779
Northing	1184366
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises two cairns of the Neolithic or Bronze Age, built probably between 4000 and 1000 BC. They are visible as two circular spreads of stones in close proximity to one another. The northernmost is around 14m in diameter, while the other is less well defined and about 12m in diameter. The cairns stand some 20m above sea level on a south-facing hillside, one above the other, with extensive views to the south and east, especially across the Voe of Brig. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The surface remains of both cairns have been disturbed, but their form is still discernible and important archaeological information is likely to survive beneath the surface. The close proximity of the two cairns is of considerable interest as this is rare in the area and may indicate that this particular location was a focal point for burial over a significant period of time. The excavation of similar cairns elsewhere in Scotland has demonstrated that round cairns were often used to cover and mark human burials and are late Neolithic or Bronze Age in origin, dating most commonly from the late third millennium BC to the early second millennium BC. Burial cairns of this type may incorporate or overlie several graves or pits containing cist settings, skeletal remains in the form of cremations or inhumations, pottery and stone tools. Archaeologists often find additional burials within cairns, away from the central burial and it is possible that one or more additional burials survive here. These deposits can help us understand more about the practice and significance of burial and commemoration of the dead at specific times in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried land surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains, including pollen or charred plant material, may survive within archaeological deposits deriving from the cairns' construction and use. This evidence can help us build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn. Contextual characteristics; Cairns are well represented in Shetland, but researchers have highlighted the importance of Shetland's circular stone-built cairns. Across Scotland, cairns seem to be positioned for visibility within their landscape setting, often specifically to maximise their visual impact, and they are often inter-visible. The position and significance of these cairns in relation to other prehistoric monuments is likely to be significant and merits future detailed analysis. There is a group of three chambered cairns 1.1km to the NNE and a single chambered cairn 5km to the west. Comparison of these cairns with other prehistoric sites in the area means that this monument has the potential to further our understanding of ritual and funerary site location and practice and to enhance understanding of the structure of early prehistoric society and economy. Associative characteristics; Like many of Shetland's prehistoric monuments, these two cairns have become the focus of local stories. The word 'meishie' is the name of a traditional Shetland basket used for carrying grain. According to local legend, a giant was carrying a 'meishie' full of stones when the basket broke at this place leaving it strewn with rock. The association of cairns and giants is quite common in NW Shetland: another local cairn is called the 'Giant's grave'. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death and burial in prehistoric life.

Asset/Event Number	27
Asset/Event Name	Beorgs of Housetter, chambered cairn 730m NW of Setter House
Type of Asset/Event	Chambered Cairn
Date and/or Period	Neolithic
Listing No./NRHE Number	SM3569
HER Number	847
Status	Scheduled Monument
Easting	436036
Northing	1185444
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises a heel-shaped chambered cairn of the Neolithic period, built probably between 4000 and 2500 BC. It is visible as an upstanding stone-built structure with large facing stones. The cairn measures around 5.5m NW-SE by 5m transversely and stands 0.6m high. Its concave façade is well defined, largely intact and faces southeast. The entrance to the passage is 0.4m wide and is set slightly off-centre in the façade. The passage is 1.5m long and runs NW-SE before joining the exposed chamber, which has an unusual slightly irregular elongated plan. The walls of the chamber stand up to 1m high and are constructed of large flat-topped boulders, which would have supported the now absent capstone. Other large boulders occur in the façade, with smaller stones forming the kerbing around the sides and back of the cairn, which has the effect of heightening the overall impressive visual impact of the façade. The cairn stands 90m above sea level on the rocky steep-sided slope of the Beorgs of Housetter, above and slightly WSW of Trowie Knowe, and overlooking the Loch of Housetter 250m to the east. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan with a diameter of 20m and is centred on the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument is in a stable condition and retains its form to a very significant degree. The monument retains several interesting features, including the curving line of the façade. The passage to the chamber is off-centre so that the passage joins the chamber closer to its NE side. The floor of the passage and chamber are paved with stone and, in the SW half of the chamber, the floor is slightly raised to form a slight bench or shelf. This arrangement has similarities with the chambered cairns on Ronas Hill and Islesburgh. The Beorgs of Housetter cairn was partly excavated sometime before 1902, but is highly likely to preserve further evidence for its development sequence. Chambered cairns are Neolithic in origin, dating most commonly from the third and fourth millennia BC. Excavation elsewhere suggests that they were used over a lengthy period and housed the remains of multiple individuals. Despite the removal of stone from this cairn, significant archaeological information is likely to survive beneath its surface. The excavation of similar mounds elsewhere in Scotland shows that cairns might be adapted over time and might also form a focus for burial in later periods. Buried deposits associated with cairns can help us to understand more about the practice and significance of burial and commemorating the dead at specific periods in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried ground surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains, including pollen or charred plant material, may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us to build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn. Contextual characteristics; Heel-shaped cairns are a rare and distinctive form of chambered cairn found in the Shetland Islands. Heel-shaped cairns share several similar traits with prehistoric houses in Shetland, especially their elaborate well-built façades. The large prehistoric house at Stanydale, which is often referred to as a 'temple', has a very similar heel-shaped façade. Heel-shaped cairns are believed to be a variation of the 'Orkney Cromarty' cairn

type, as identified by Henshall, but their size is typically much smaller. This example also has particular interest because of its location in a landscape rich in prehistoric monuments, including other cairns. There are other cairns 130m to the east and 180m to the northeast. Across Scotland, cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this cairn in relation to two other cairns in close proximity is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to further our understanding not just of funerary site location and practice, but also of the structure of early prehistoric society and economy. Associative characteristics; The site was visited in 1902 by Robert Munro and John Abercromby, both eminent archaeologists of the period, who interpreted the structure as a beehive hut, rather than a chambered cairn. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it lies in a landscape where there is a wealth of prehistoric monuments. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death and burial in prehistoric times.

Asset/Event Number	28
Asset/Event Name	Haa, Skelberry, burnt mound 310m NNE of
Type of Asset/Event	Burnt Mound
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3570
HER Number	835
Status	Scheduled Monument
Easting	436553
Northing	1186912
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises the remains of a substantial burnt mound, visible as an upstanding horseshoe-shaped earthwork measuring about 19m NW-SE by 15m transversely and standing up to 2.1m high. The open end of the mound faces a small stream 20m to the southwest. The burnt mound is likely to date to between 2000 and 1000 BC. The monument lies 310m NNE of Haa, Skelberry, on grazing land 25m west of the A970 road. It stands at around 35m above sea level towards the base of a valley that leads north for 1.5km to meet the sea at Burra Voe. The monument was first scheduled in 1975, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is irregular on plan, with maximum measurements of 36.5m by 34m, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The scheduling specifically excludes the above-ground elements of the post-and-wire fences that cross the scheduled area to allow for their maintenance. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; This monument survives in good condition as an upstanding, largely turf-covered mound. It has excellent field characteristics and shows the classic horseshoe or crescent shape typical of burnt mounds. Several small localised areas of erosion show that, beneath the turf, the mound is composed mainly of small fire-reddened stones. It is very probable that the remains of a trough survive towards the centre of the monument, in the low area surrounded by the mound. This monument has good potential to inform our understanding of the date and nature of burnt mounds, their function(s) and duration. It may contain artefacts or ecofacts that can increase our understanding of the

function of burnt mounds and how they were used. The mound is likely to have accumulated directly on an old ground surface and may seal important environmental information that could increase our knowledge of the landscape and land-use before and during the mound's creation. Contextual characteristics; Burnt mounds are made from heaps of burnt and fire-cracked stone, occurring usually within a matrix of dark soil and perhaps charcoal or ash. The stones represent the waste product from the use of hot stones to heat water, probably for a variety of purposes. After several immersions, the stones would crack and break and were discarded to form burnt mounds. Burnt mounds are often accompanied by troughs that held the water and there is sometimes evidence for associated shelters and the hearths in which the stones were heated. Troughs are usually set in the ground and lined with wood, stone or clay. Burnt mounds typically lie close to a stream or other water source, as in this case. There are around 1,900 recorded examples of burnt mounds in Scotland with notable concentrations in some areas, including Shetland. The greater number in Shetland may also reflect increased survival because of a lack of later development or agricultural improvement. Burnt mounds in the Northern and Western Isles and northern Scotland are often particularly large. They often show a classic crescentic shape and may have been reused on many occasions over a significant period. They may also have served different social and practical functions to smaller mounds. In Scotland, excavated examples typically date to the middle Bronze Age, around 1500 BC, but the overall range of dates varies from the late Neolithic through to the early historic period (around 2400 BC to AD 900). A common interpretation of these monuments in Scotland is that they were used to boil water for cooking. However, researchers have also suggested that they could have been used as saunas or sweat-lodges (possibly medicinal as well as sanitary); as baths; or for textile production (dying and fulling), brewing or leather working. Burnt mounds are often found in relatively isolated locations in Scotland, but in Shetland they sometimes occur in association with settlement remains. Two chambered cairns sited around 1.5km south of this burnt mound demonstrate that this part of the landscape had been utilised by people in the Neolithic period, probably several centuries before the burnt mound developed. Another cairn and a standing stone close to the chambered cairns hint that activity here may have continued into the Bronze Age. It is probable that the burnt mound was part of a wider contemporary landscape of settlement and land-use, and there is potential to investigate whether the burnt mound is sited close to, or away from, foci of contemporary domestic activity. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular prehistoric society and the construction and use of burnt mounds and their placing in the landscape. The good preservation of the monument, which retains its form to a marked degree, enhances this potential. The loss of this monument would impede our ability to understand the nature of later prehistoric domestic and ritual practice in Shetland.

Asset/Event Number	29
Asset/Event Name	Mangaster Voe, prehistoric house 610m NW of Innbanks
Type of Asset/Event	House
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3571
HER Number	830
Status	Scheduled Monument
Easting	433107
Northing	1170127
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises the remains of a prehistoric house with a possible annex on its north side. The house is roughly circular, approximately 8m N-S by 7m transversely, within walls about 1.5m wide that appear as low footings of turf and stone. The house is believed to be late Neolithic or Bronze Age in date (around 3000 to 1000 BC). It is located just above sea level on a

small promontory that consists of semi-improved grassland and overlooks Mangaster Voe to the north. The monument was originally scheduled in 1974 but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is irregular on plan, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The prehistoric house survives in good condition. The overall form of the house is visible and sections of stone wall-facing protrude through the turf in places. The site is likely to contain important buried deposits, including artefacts, ecofacts and other environmental evidence. Examination of the building foundations can give us detailed information about the form and construction of prehistoric houses, while buried features within the building interior can contribute to our understanding of how houses were used and how this might change over time. Buried artefacts and ecofacts and buried soils can contribute to our understanding of how people lived and worked, and allow us to improve our understanding of prehistoric trade and exchange and the nature of the agricultural economy. Archaeological investigation at similar sites has yielded high quality artefactual and ecofactual material, which can help us to build up a fuller picture of prehistoric domestic life. Contextual characteristics; This is one of a number of broadly similar prehistoric houses that characterise early settlement and the development of agriculture in the third to second millennium BC in Shetland. It is part of a relatively rare and geographically restricted group, which gives us a more balanced view of prehistoric life, when compared with the more common and widespread burial and ceremonial monuments of the later Neolithic elsewhere in Scotland. The house lies in close proximity to other broadly contemporary monuments: another prehistoric house lies 50m to the southwest, and a group of four prehistoric houses is situated 360m to the southeast. This monument is an important element of a much wider relict landscape and it testifies to early human efforts to exploit land and natural resources for agricultural production. There can be an impressive time-depth to these early houses, as may well be the case here, which can tell us much about change and continuity over long periods. Comparison of this site with the other prehistoric remains in the area would help us to develop a much better understanding of prehistoric domestic life and land-use. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular, the nature of prehistoric settlement, agriculture and land-use in Shetland. It has the potential to improve our understanding of the distribution of settlement, the structural techniques used to build houses, and changes in the nature of settlement over time. There is also excellent potential to study how the site fitted into a landscape that is rich in prehistoric remains. The loss of this monument would impede our ability to understand the nature of prehistoric domestic architecture and settlement both in Shetland and Scotland.

Asset/Event Number	30
Asset/Event Name	Mangaster Voe, prehistoric house 630m NW of Innbanks
Type of Asset/Event	House
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3572
HER Number	830
Status	Scheduled Monument
Easting	433067
Northing	1170085
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises the remains of a prehistoric house. The remains consist of a roughly circular mound with a pronounced hollow in the centre. The house is approximately 12m N-S by 8.5m transversely, and consists of low footings of turf and stone. Small sections of stone

facing are visible on the northern edge of the mound. The house is believed to be late Neolithic or Bronze Age in date, around 3000 to 1000 BC. It is located 30m from the shore at around 10m above sea level and lies on semi-improved grassland overlooking Mangaster Voe to the north. The monument was originally scheduled in 1974 but the area was inadequate and the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan, 30m in diameter, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The prehistoric house survives in good condition. The overall form of the house is visible and sections of stone wall-facing protrude through the turf in places. The site is likely to contain important buried deposits, including artefacts, ecofacts and other environmental evidence. Examination of the building foundations can give us detailed information about the form and construction of prehistoric houses, while buried features within the building interior can contribute to our understanding of how houses were used and how this might change over time. Buried artefacts and ecofacts and buried soils can contribute to our understanding of how people lived and worked, and improve our understanding of prehistoric trade and exchange and the nature of the agricultural economy. Archaeological investigation at similar sites has yielded high quality artefactual and environmental material, which can help us to build up a much fuller picture of prehistoric domestic life. Contextual characteristics; This is one of a number of broadly similar prehistoric houses that characterise early settlement and the development of agriculture in the third to second millennium BC in Shetland. It is part of a relatively rare and geographically restricted group, which gives a more balanced view of prehistoric life when compared with the more common and widespread burial and ceremonial monuments of the later Neolithic elsewhere in Scotland. The house lies in close proximity to other broadly contemporary monuments: another prehistoric house lies 50m to the northeast, and a group of four prehistoric houses is situated 360m to the southeast. This monument is an important element of a much wider relict landscape and it testifies to early human efforts to exploit the land and natural resources close to the shoreline at Mangaster Voe for agricultural production. There can be an impressive time-depth to these early houses, as may well be the case here, which can tell us much about change and continuity over long periods. Comparison of this site with the other prehistoric domestic remains in the area would help us to develop a much better understanding of prehistoric domestic life and landuse. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to the understanding of the past, in particular, the nature of prehistoric settlement, agriculture and landuse in Shetland. It has the potential to improve our understanding of the distribution of settlement, the structural techniques used to build houses and changes in the nature of settlement over time. There is also excellent potential to study how the site fitted into a landscape that is rich in prehistoric remains. The loss of this monument would impede our ability to understand the nature of prehistoric domestic architecture and settlement, both in Shetland and Scotland.

Asset/Event Number	31
Asset/Event Name	Isleburgh, chambered cairn 745m SSW of
Type of Asset/Event	Chambered Cairn
Date and/or Period	Neolithic
Listing No./NRHE Number	SM3573
HER Number	785
Status	Scheduled Monument
Easting	433474
Northing	1168453
Parish	Northmaven
Council	Shetland Islands

Description

The monument comprises a heel-shaped chambered cairn of the Neolithic period, built probably between 4000 and 2500 BC. It is visible as a low turf-covered mound with most of the facing stones visible. The cairn measures around 8m SW-NE by 5m transversely and stands 0.85m high, and has a well-defined concave façade, 8m wide and facing southeast. The entrance to the passage, 0.4m wide, is slightly off-centre in the façade. The passage is 1.4m long and runs NW-SE before joining the chamber. The chamber is roughly square in plan, 1.2m long by 1.5m wide, with its sides constructed from a single large flat stone, which would have supported the now absent capstone. Aside from the stones that make up the chamber, the largest boulders occur in the façade, with smaller stones forming the curbing around the sides and back of the cairn. This has the effect of heightening the overall impressive visual impact of the façade. The cairn stands 3.6m above sea level on a knoll that overlooks the Holm of Culsetter and Mavis Grind, which is located 500m to the east. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is circular on plan with a diameter of 30m and is centred on the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument is in a stable condition and retains its form to a very significant degree: in fact it is a textbook example of a heel-shaped cairn. The monument retains several interesting features, including the curving line of the façade which tapers out to points on either side and resembles 'horns' on plan. Some of the stones that make up the façade partly block the passage to the inner chamber. The floor of the passage and chamber are paved with stone and, in the NE half of the chamber, the floor is slightly raised and forms a slight bench or shelf. This chamber with its stone shelf has similarities with the chambered cairn on Ronas Hill. The Isleburgh cairn was partly excavated in the late 1950s, but is still likely to preserve evidence for its development sequence. The excavation uncovered the full extent of the façade and revealed a small pit at the end of each of the 'horns'. Both of these pits contained pecked stone tools, possibly plough shares. Such finds are common from prehistoric houses and indicate a tangible connection between the inhabitants of the houses and the construction and use of the burial cairns. Chambered cairns are Neolithic in origin, dating most commonly from the third and fourth millennia BC. Excavation elsewhere suggests that they were used over a lengthy period and housed the remains of multiple individuals. Despite the removal of stone from this cairn, significant archaeological information is likely to survive beneath its surface. The excavation of similar mounds elsewhere in Scotland shows that cairns might be adapted over time and might also form a focus for burial in later periods. Buried deposits associated with cairns can help us to understand more about the practice and significance of burial and commemorating the dead at specific periods in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried ground surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains including pollen or charred plant material may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us to build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn. Contextual characteristics; Heel-shaped cairns are a rare and distinctive form of chambered cairn found in the Shetland Islands. Heel-shaped cairns share several similar traits with prehistoric houses in Shetland, specifically their elaborate well-built façades. The large prehistoric house at Stanydale, which is often referred to as a 'temple', has a very similar heel-shaped façade. Heel-shaped cairns are believed to be a variation of the ''Orkney Cromarty' cairn type, as identified by Henshall, but their size is typically much smaller. This example also has particular interest because of its location in a landscape rich in prehistoric monuments, including other cairns and settlement remains. There is another cairn 1km to the south and prehistoric houses 125m to the WNW, 1.3km to the north and 900m to the south. Across Scotland cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this cairn in relation to contemporary agricultural land and settlement is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to further our understanding not just of funerary site location and practice, but also of the structure of early prehistoric society and economy. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried

	evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it lies in a landscape where there is a wealth of prehistoric monuments, including settlements. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death and burial in prehistoric times.

Asset/Event Number	32
Asset/Event Name	Crooksetter Hill, chambered cairn at SE summit of
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3576
HER Number	1220
Status	Scheduled Monument
Easting	442004
Northing	1175644
Parish	Delting
Council	Shetland Islands
Description	The monument consists of the remains of a prehistoric chambered burial cairn, surmounted by a modern surveyors' cairn, on the SE summit of Crooksetter Hill. The cairn, which has been mislocated on the Ordnance Survey 1:10 000 map, is of heel-shaped plan. The facade faces SE. The cairn is 13m across (NE-SW) by 8m. The interior is concealed by the modern cairn which surmounts it. A number of earth-fast boulders mark the outer kerb of the cairn. The area to be scheduled is circular, centred on the modern cairn and measuring 30m in diameter, to include the prehistoric cairn and a small area around it in which evidence relating to its construction and use may survive, as marked in red on the accompanying map. The monument is of national importance as a prehistoric burial cairn which may retain original deposits within the body of the cairn and beneath it. It has the potential to contribute to an understanding of prehistoric burial practices and agricultural economy.

Asset/Event Number	33
Asset/Event Name	Punds Water, house and enclosure to W of,Mangaster
Type of Asset/Event	House and Enclosure
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3577
HER Number	831
Status	Scheduled Monument
Easting	432345
Northing	1171517
Parish	Northmaven
Council	Shetland Islands
Description	The monument consists of the remains of a prehistoric house and an associated enclosure wall, cutting off a promontory on the W side of Punds Water. The house is very substantially constructed, and measures about 11m in overall diameter. Internally it has a central area

flanked by 4 large and 1 small recesses, possibly bed-niches. Entrance is by a narrow passage, which opens from a paved external courtyard. The careful construction of the house, and the plan (especially its concave facade) suggests a link with the architecture of chambered burial cairns, especially the fine example nearby. The house lies 40m outside an enclosure, formed by a wall of large boulders which cuts off a promontory projecting into the loch. As both the house and the enclosure wall are founded below the deep peat which covers the area, they may be broadly contemporary. The site is most probably a late Neolithic farmstead, with the enclosure serving to enfold stock. The area to be scheduled is the entire promontory, bounded by the loch and by a curving line drawn between the heads of the loch's two SW inlets and passing 30m to the W of the house. The large area so defined includes the house and enclosure wall and an area of land in which deep peat almost certainly conceals further evidence of contemporary structures. The area to be scheduled is marked in red on the accompanying map.

Asset/Event Number	34
Asset/Event Name	Trowie Knowe chambered cairn
Type of Asset/Event	Chambered Cairn
Date and/or Period	Neolithic
Listing No./NRHE Number	SM3578
HER Number	834
Status	Scheduled Monument
Easting	436198
Northing	1185526
Parish	Northmaven
Council	Shetland Islands
Description	The monument comprises a heel-shaped chambered cairn of the Neolithic period, built probably between 4000 and 2500 BC. It is visible as an upstanding stone-built structure with large facing stones and a largely intact chamber. The cairn measures around 8.6m in diameter and stands between 0.5m and 1.5m high. The cairn has been robbed of material in the past, but the location of the passage is discernible from the layout of the surviving chamber. The chamber is irregular on plan and comprised of two massive blocks of stone that would have supported the now absent capstone. The façade was on the eastern edge of the cairn. A pillar-like stone at its S corner marked the end of what would have been an impressive concave façade. The cairn stands 30m above sea level on a gentle slope at the base of the steep-sided slope of the Beorgs of Housetter and overlooks the Loch of Housetter 100m to the east. The monument was first scheduled in 1974, but the documentation does not meet modern standards: the present rescheduling rectifies this. The area to be scheduled is a circle, 25m in diameter, centred on the monument. The scheduling includes the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. The monument's cultural significance can be expressed as follows: Intrinsic characteristics; The monument is in a stable condition and retains its form to a significant degree. The cairn has been robbed in the past and partly excavated at least three times, most recently in 1904. The western side of the monument is well defined by facing stones, while the eastern half of the monument has been more heavily robbed. However, there is still a large amount of stone on site and the original cairn would have been very substantial. The remaining spread of stones gives the cairn a circular appearance. The monument preserves several interesting features, including the irregular burial chamber. Despite the removal of stone from this cairn, significant archaeological information is likely to survive beneath its surface, including evidence for its development sequence. During excavation, the chamber was found to contain charcoal deposits and the floor of the chamber was paved with stone, which was not removed. Chambered cairns are Neolithic in origin, dating most commonly from the third and fourth millennia BC. Excavation elsewhere suggests that they were used over a lengthy period and housed the remains of multiple individuals. Such cairns were often adapted over time and

could also form a focus for burial in later periods. Buried deposits associated with cairns can help us to understand more about the practice and significance of burial and commemorating the dead at specific periods in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried ground surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains, including pollen or charred plant material, may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us to build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn. Contextual characteristics; Heel-shaped cairns are a rare and distinctive form of chambered cairn found in the Shetland Islands. Heel-shaped cairns share several similar traits with prehistoric houses in Shetland, especially their elaborate well-built façades. The large prehistoric house at Stanydale, which is often referred to as a 'temple', has a similar heel-shaped façade. Heel-shaped cairns are believed to be a variation of the 'Orkney Cromarty' cairn type, as identified by Henshall, but their size is typically much smaller. This example also has particular interest because of its location in a landscape rich in prehistoric monuments, including other cairns. There are other cairns 75m to the SSW and 180m to the SW. Across Scotland, cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this cairn in relation to the two other cairns nearby is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to further our understanding not only of funerary site location and practice, but also of the structure of early prehistoric society and economy. Associative characteristics; The site was partly excavated in 1904 by John Abercromby, an eminent archaeologist of the period. The name 'Trowie Knowe', which means troll or fairy mound, implies that the cairn was a focus of local superstition. National Importance; This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it lies in a landscape where there is a wealth of prehistoric monuments. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death and burial in prehistoric times.

Asset/Event Number	35
Asset/Event Name	Crooksetter Hill, chambered cairn near NW summit of
Type of Asset/Event	Chambered Cairn
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3608
HER Number	1219
Status	Scheduled Monument
Easting	441760
Northing	1175902
Parish	Delting
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	36

Asset/Event Name	Burravoe, broch on NW promontory, Brae
Type of Asset/Event	Prehistoric domestic and defensive: broch
Date and/or Period	Prehistoric
Listing No./NRHE Number	SM3657
HER Number	778
Status	Scheduled Monument
Easting	435885
Northing	1166950
Parish	Delting
Council	Shetland Islands
Description	No Description Available

Asset/Event Number	37
Asset/Event Name	Vidlin, broch at W end of Ayre of Vidlin
Type of Asset/Event	Broch
Date and/or Period	Iron Age
Listing No./NRHE Number	SM6073
HER Number	1193
Status	Scheduled Monument
Easting	447952
Northing	1165456
Parish	Nesting
Council	Shetland Islands
Description	The monument consists of the remains of a broch, an Iron Age fortified dwelling. The monument was first scheduled in 1994. However, access works associated with the construction of a nearby marina considerably changed the surrounding land form shortly after it was scheduled. This rescheduling seeks to clarify the scheduled area in light of these alterations. The broch is represented by an irregular mound, some 3m high. It has plainly been quarried into in the past, notably for the Methodist chapel, built in 1829, which stands on its NW side. No details of the dimensions or construction of the broch are visible at present, but there are reliable accounts of a broch-like structure being partly revealed at various dates. The surviving mound represents the remains of this activity, and almost certainly overlies the foundation levels of the broch. It is situated on a small promontory at the W end of the Ayre of Vidlin, projecting into Vidlin Voe. Its coastal location is now slightly at a remove due to the construction of the marina and its associated works. The area proposed for scheduling comprises the remains described and an area around them within which related material may be expected to be found. It is irregular in shape and bounded on the W by the outer face of the church and the boundary of its access track. On the N, NE, E and SE it is bounded by the access track and car park for the nearby marina. The road, carpark and lay-bys are all excluded from the scheduled area. It has maximum dimensions of 41m NNE-SSW by 24m transversely, as marked in red on the accompanying map. The monument is of national importance as a large broch mound, the remains of an Iron Age settlement type, a type characteristic of the Northern Isles. It has the potential to contribute to an understanding of prehistoric defended settlements and economy. Its importance is increased by its proximity to other monuments of potentially contemporary date.

Asset/Event Number	38
Asset/Event Name	The Kames, coastal defence battery 100m SE of, Calback Ness
Type of Asset/Event	Coastal Defence Battery
Date and/or Period	WW2
Listing No./NRHE Number	SM10756
HER Number	115418
Status	Scheduled Monument
Easting	438616
Northing	1176516
Parish	Delting
Council	Shetland Islands
Description	The monument comprises a World War II coastal defence battery sited on the western side of Calback Ness, facing Gluss Isle and Bardister Ness, and with commanding views over the important deep-water anchorage of Sullom Voe. The battery was established during the early stages of the conflict. It was armed with two 4 inch guns taken from the Ness of Sound coastal battery in August 1940, when the latter was being re-armed with 6 inch guns. The guns were removed in 1944. The remains consist of: 1. A Battery Observation Post. This two storey concrete structure is partly dug into the hillside and is situated above the gun emplacements and the searchlight positions. Internally there is evidence for a fireplace and the concrete stand for the position finder is still extant. The building has an intact covered corridor, accessible directly from the lower level or via a set of external concrete steps. The corridor connects the observation post with the gun emplacements. Like all the structures, the flat roof of the observation post is covered with turf, part of the original camouflage scheme. 2. Two Gun Emplacements. These concrete structures still retain the gun holdfasts and the concrete ammunition recesses. Behind the gun emplacements, partly dug into the hillside, are the gun detachment shelters, complete with main and secondary entrances and fireplaces. Within these shelters contemporary graffiti includes pin-ups and caricatures of Winston Churchill and Adolf Hitler. 3. Magazines. For each gun emplacement there are a pair of subterranean rooms, accessed from a covered corridor. This arrangement allowed the cartridges and shells to be contained as separate items, which were brought together only at the gun itself, thus preventing accidental explosions. Some stencilling survives at the magazines. 4. Covered Corridors. The main elements of the battery - the observation post, the gun emplacements and the emergency/section observation post - are linked by a series of covered corridors. The corridors also lead to a number of storerooms and the magazines. They are constructed of cast concrete and corrugated iron (used for shuttering), and are turfed over for camouflage. 5. Searchlight Positions. Each gun had its own searchlight low down towards the shore. The emplacements are constructed in concrete and have an overhanging roof, rectangular searchlight area and a small bunker to the rear. Both are built partly into the hillside and are reached by a flight of concrete steps. 6. Engine Rooms. The battery was serviced by two engine rooms, each providing power to a gun emplacement and a searchlight. 7. Emergency/Section Observation Post. Set above the No. 2 gun emplacement is a concrete structure with a corrugated roof, containing a single large vision slot, which probably served as a secondary observation post. 8. Local Air Defence was provided by a 3 inch UP (unrotated projectile), as indicated by the presence of a single launcher base near the battery observation post. The area to be scheduled includes all the elements of the battery mentioned above, together with an area around them in which related remains may be expected to survive. The area to be scheduled has maximum dimensions of 280m NNE-SSW by 145m transversely. In addition there are two separate areas covering the searchlight positions, each a circle 22m in diameter. The three areas are indicated in red on the accompanying map. The monument is an extremely well-preserved example of World War II coastal defence battery. It is certainly the best example of its type in Shetland. Its of particular interest because of the remarkable survival of contemporary graffiti cartoons, which brings an unusual degree of contact with the individual users of the monument.

Asset/Event Number	39
Asset/Event Name	Lunna House
Type of Asset/Event	Formal Designed Landscape
Date and/or Period	17th Century
Listing No./NRHE Number	GDL00271
HER Number	181757
Status	Garden and Designed Landscape
Easting	448743
Northing	1169309
Parish	Nesting
Council	Shetland Islands
Description	Probably the best surviving example of a formal designed landscape laid out in characteristic Shetland style with garths, walled enclosures, eyecatchers and ancillary buildings situated in a direct relationship to one another. The mid-17th century layout was increasingly formalised and ornamented during the early 18th and early 19th centuries, accompanying major additions to the house. Artistic Interest; The Lunna designed landscape is exceptional in Shetland in terms of its scale, execution and detail. This gives the site outstanding value as a Work of Art. Historical; Lunna's role in international events, together with human activity over a considerable period give the site high Historical value. Horticultural; The flower garden and formal tree planting, give Lunna some Horticultural value. Architectural; The quality of design of the house and landscape including ancillary structures are integral to the design layout with the result that the ensemble is of outstanding Architectural value. Archaeological; The Scheduled Ancient Monuments, known archaeology and potential archaeological interest in the area give the site outstanding Archaeological value. Scenic; The range of buildings within the Lunna designed landscape is prominent features and local landmarks. The Lunna landscape forms a distinctive contribution to the Mainland and the site thereby is of outstanding Scenic value. Nature Conservation; The combination of heath, rough grassland, garden and coastal habitats at Lunna give it high Nature Conservation value. Location and Setting; Lunna House is situated on the Lunna peninsula, East Mainland, 14.5km (9 miles) east of Voe and 40km (25 miles) north of Lerwick. A public road, the B9071, leads along the length of the Lunna peninsula, northwards from Vidlin and Lunnasting. The House and designed landscape are situated at the isthmus of the Lunna peninsula, with the House sited on high ground to the north, and follies and eyecatchers situated on high ground, opposite to the south. From these highpoints there are extensive views over Lunna Sound to the west and Vidlin Voe to the east. It is difficult to determine the full extent of the designed landscape, due to the rugged topography and rough grassland extending across the area. Architectural design features extend throughout an area of c 58ha (143 acres), with the main concentration in 26ha (64 acres) around the house and farm. The extent of the designed landscape has not altered since the early 19th century (1875, OS 6"; 1900, OS 6"). Site History; There is evidence of prehistoric and early historic settlement in the environs of Lunna. South-west of Lunna House is Chapel Knowe, situated on the design axis, the site of a monastery (Scheduled Ancient Monument). It is enclosed by the remains of a medieval stone and earth rampart, up to 1.2m (4ft) high and 1.8 (6ft) in breadth. In the western half of this enclosure are the foundations of a building (8.3m by over 2.7m) said to be the early parish church. Lunna House may be the site of an earlier, medieval haa. Lunna House dates from 1660 and was built for Robert Hunter, Chamberlain of the Lordship of Zetland (d.1695). The marriage of Thomas Hunter and Grisella Bruce in 1707 is commemorated in an armorial panel in the house's south gable wall. Although it is difficult to date the various architectural features relating to the formal landscape, some date to the 18th century and others are 19th century additions. Lunna Kirk, adjacent to Chapel Knowe, was built in 1753 at Robert Hunter's expense, on the site of the family mausoleum. In the early 19th century innovative features and Gothic ornament were added. A series of flues forming a 'hot wall', modelled on the method used in walled gardens, was constructed at the kirk (Scottish Vernacular Buildings Working Group, 1997 mentioned in 'List of Buildings…'). Buttresses were also added and appear to have originally been terminated by tapered obelisks

with beach-stone finials. These complemented Gothic elements comprising the West Gates, Gothic Cottage and Folly, the latter acting as an eyecatcher from the House and said to have been used by the Hunters to watch the comings and goings of their tenants to prevent them trading with other merchants. The major 19th century intervention was the construction of Lunna harbour and pier and its adjacent beehive-shaped lime kiln, along with the Walled Garden. In 1893, Robert Bell Hunter, the 8th Laird, sold the property to John Bruce of Sumburgh who enlarged it in the early 20th century. The architect/designer is not known. Lunna is famous for its role in the 'Shetland Bus' operations between 1941-45, but following the war it was close to dereliction. In the 1960s it was acquired by the Lindsay family who commenced buildings restoration. The designed landscape is now divided between two principal owners. The major part of the landscape is associated with Lunna Farm, the core area remaining with the House. Architectural Features; Lunna House built in the late 17th century, was originally T-plan, two-storeys and attic with a three-bay front, extended in the early 18th and 20th centuries. South-west of the House are sets of droved ashlar gate piers leading to an approach lined by low drystone walls. This leads downhill on the main axis, and through the West Gate, formed by ball finialled twin gate-piers and paired mounting blocks to either side of the gateway. This lies on an axis with Lunna House, Chapel Knowe, the Gothic Cottage and hilltop Folly. The early 19th century Gothic Cottage is single-storey, built of harl-pointed rubble and drystone walls. Its north-west front is symmetrical with Gothic detailing. An early 18th century folly, Hunter's Monument, terminates this south-west axis as an eyecatcher, 0.5km south of the House. It is a harl-pointed, slab-roofed, square tower with battlemented flanking walls, which continue in dry-stone, extending downhill to the beach at West Lunna Voe on the north-west and to the Booth of Lunna, at East Lunna Voe, to south-east. The latter is a ruined fishing booth of mid 18th century date, originally three-chambered. It is unusual in being T-plan in layout. Despite its ruinous state, it is one of the largest and best preserved of Shetland's fishing booths. It lies adjacent to a Drying Beach, partly man-made. Lunna Kirk, built in 1753 to the north-west of the booth, is a small rectangular building with a rear forestair to the gallery. The kirkyard is enclosed by a dry-stone wall, which on its south side is incorporated into a field-wall extending across the designed landscape south of the house and containing the West Gate noted above. Lunna Harbour, pier and lime kiln date from the early 19th century and stand within the designed landscape on the shores of West Lunna Voe. The Farmsteading stands to the north-west of Lunna House. Drives & Approaches; The main approach to Lunna House was from the south-west by a steep stone ramp. A similar ramp connected the House to the Fishing Booth on the shore of East Lunna Voe. To the north, a drive links Lunna House to the farmstead on the main design axis (lying south-west to north-east). The public road adopts a less formal route, curving around the north and east sides of the house. To the south-west, the road passes between Chapel Knowe and the Walled Garden, then uphill to Lunna Farm. A drive leading south east from the House is cut into the hillside and, for part of its length, is supported by retaining walls. It leads to the Croolar, a waterlogged basin. Parkland; South of Lunna House is a sloping lawn bounded by a low stone wall. Below that is the South Park, now used as a paddock, bisected by the main south-west approach. North-east of the House is a square park enclosed by a drystone wall. It is cultivated. Water Features; The Croolar is a waterlogged basin at the end of the south-east drive. The area is encircled by a bund and footpath. Excess water is drained by a small channel into the sea. Moss growth within the basin has resulted in distinct, formal patterns visible from elevated ground. Adjacent to the northern boundary of the designed landscape are two natural lochans, Northgrid Loch and Loomi Shun. The Gardens; South-east of Lunna House is a terraced, walled garden, accessed by paired gateways with rough gatepiers with beach-stone finials. It is roughly triangular in shape with a perimeter footpath. Inside the wall is a shrub windbreak. Now used for vegetables, it was built as an ornamental garden, to be viewed and enjoyed from the house. The garden was set with a sun dial, added by 1878 (1878, OS 6"). Adjacent to the garden is a rectangular walled enclosure, grassed and containing a stand of sycamore (Acer pseudoplatanus). Walled Gardens; The Walled Garden is situated on low-lying flat ground, adjacent to the harbour. It is roughly triangular in shape with an irregular internal layout. A number of internal walls create sheltered compartments for fruit and vegetables. It is currently disused.

Asset/Event Number	40
Asset/Event Name	West Sandwick, North Haa (West Sandwick House), Including Garden Walls, Gates And Gatepier

Type of Asset/Event	House, Garden and Pier
Date and/or Period	17th Century
Listing No./NRHE Number	LB18648
HER Number	1241
Status	Listed Building - Category A
Easting	444557
Northing	1187973
Parish	Yell
Council	Shetland Islands
Description	17th century, with addition of circa 1770, both remodelled circa 1830. Laird's house comprising symmetrical 2-storey 3-bay remodelling of 17th century house, connected by central 2-storey link to 2-storey and attic 3-bay classical remodelling of later 18th century house to S; latter flanked to E and W by walls connecting to single storey single bay pedimented pavilions. Harled and lined rubble walls with droved sandstone ashlar margins and details. Projecting cills to windows. S (PRINCIPAL) ELEVATION: symmetrical, droved ashlar single storey pedimented porch projecting at centre comprising vertically-boarded timber door with plate glass fanlight, channelled ashlar surround, flanked by pilasters with rosettes, urn finial to pediment; windows flanking outer bays at ground; round-arched window centred at 1st floor, tripartite windows in outer bays; principal block flanked by single storey single bay walls with glazed doors; single storey single bay pavilions advanced and flanking to outer right and left, each with Venetian windows and pediments with blind oculi and ball finials. E ELEVATION: 4-pane timber sash and case window to link recessed between blank gables of N and S blocks; gable of N block advanced at right and blank E wall of E pavilion advanced at left. N ELEVATION: symmetrical, timber fixed-light with triangulated glazing pattern to upper part of infilled door centred at ground; windows in flanking bays, regular fenestration at 1st floor; 2-leaf latticed gate in single storey courtyard wall extending to left; blank rear elevation of S block recessed at right. W ELEVATION: 2-bay gable of S block advanced at right, ground floor obscured by lean-to addition, regular fenestration at 1st floor, attic window to right in gablehead; 4-pane timber sash and case window to link recessed at left, blank gable of N block to outer left. Predominantly 12-pane timber sash and case windows, with 4-pane pattern to link block and lower right window of N elevation. Grey slate roofs to N and S blocks, droved ashlar skew-copes, bracketted skewputts to S block; modern metal roofs to pavilions. Harled gablehead stacks, heightened at N block, all with concrete copes and circular cans; octagonal single-flue wallhead stacks with circular cans to outer walls of pavilions. GARDEN WALLS, GATES, AND GATEPIERS: harl-pointed rubble walls enclosing roughly square formal garden to S of principal elevation adjoining pavilions at E and W; gates adjacent to pavilions comprising square droved ashlar gatepiers with bases and corniced pyramidal caps, flanked by dwarf walls with fleur-de-lys finialled railings surviving to W; railings removed from ashlar-coped dwarf wall bounding S side, cast-iron stanchions surviving to gate at centre. Basket-arched openings in walls linking N elevations of pavilions to large walled garden enclosing N side of house; garden extends to E and W, with basket-arched openings in S walls and centred in N wall, rounded corners to NE and NW. Harl-pointed rubble ashlar-coped dwarf wall forming semicircular plan enclosure within walled garden adjoining N elevation of N block, gate at N point comprising square droved ashlar gatepiers with bases and corniced pyramidal caps; rubble and concrete steps to E. Additional wall extending E from E pavilion and enclosing yard open to E. PIER: coursed stugged sandstone sides with slabbed carriageway; steps set into W side at S end. INTERIOR: late 18th century timber staircase with simple balustrade to S block; partly panelled SW attic room with dentilled cornice. Staement of specialist interest; The present house was created by John Ogilvy of Quarff soon after his marriage in 1829 to Barbara Grace Robertson who was heiress to the estate. He embarked on a remodelling of what was probably a 17th century house with a grander front block added around 1770. Ogilvy rebuilt the older house, and added the classical details and pavilions to the front block which is likely to have been a standard large Shetland haa of 3 bays with high wallhead concealing a garret. The formal arrangement of garden seems to also date from the remodelling, with the design centring on the S block. This includes the semicircular enclosure to the N which adjoins, but otherwise ignores, the N block. The pier is perhaps Shetland's finest example of a domestic pier. Viewed from the main road,

North Haa provides a spectacular focus to this part of western Yell, and indicates the impact the tall lowland design of the haas once had throughout Shetland.

Asset/Event Number	41
Asset/Event Name	Garth, Pony Pund, Including Gates, And Adjoining Outbuildings
Type of Asset/Event	Pony Pund
Date and/or Period	19th Century
Listing No./NRHE Number	LB44527
HER Number	
Status	Listed Building - Category B
Easting	440991
Northing	1174553
Parish	Delting
Council	Shetland Islands
Description	Later 19th century. Square pony pund (enclosure); harl pointed pink granite rubble walls with stugged sandstone dressings and concrete covered wallhead raised at corners. NE (ENTRANCE) ELEVATION: symmetrical, wrought iron gate with decorative latch at centre. SE ELEVATION: wrought iron gate in single doorway to left, end gable of lean to extending to left. SW ELEVATION: blank, right corner obscured by roofless lean to rubble shelter with door in re entrant of W elevation. NW ELEVATION: single doorway to right. INTERIOR: main enclosure bisected by rubble wall running N S and bounding E side of passage through 4 chamber square inner enclosure of battered rubble walls with gates grouped at centre. Mono pitch purple grey slate roof with regularly spaced timber columns bearing on stone pads continuous around W side of main enclosure (E roof demolished); modern flat roofed shed built in E corner. RUINS: rubble wall extending to E from E corner adjoining ruined rubble remains of building; with further building to NE. Statement of Special Interest; The particularly fine gates appear to be galvanised steel copies of the originals. The pund is of particular interest as an example of an unusual building type indicative of Shetland agricultural practice in the 19th century. Comparable punds can be seen at Gungstie (Bressay), Kirkabister (Yell), and Swinister (also Delting).

Asset/Event Number	42
Asset/Event Name	Swinster, Pony Pund
Type of Asset/Event	Pony Pund
Date and/or Period	19th Century
Listing No./NRHE Number	LB44533
HER Number	232103
Status	Listed Building - Category B
Easting	444336
Northing	1172222
Parish	Delting
Council	Shetland Islands
Description	Later 19th century. Square pony pund (enclosure); harl pointed rubble walls with stugged sandstone dressings, wallhead raised at corners. NW (ENTRANCE) ELEVATION: symmetrical,

	entrance gate at centre. SW ELEVATION: single doorway to outer right. INTERIOR: main enclosure bisected by rubble wall running from centre of NW to SE elevations and bounding NE side of passage through 4 chamber square inner enclosure of battered rubble walls with gates grouped at centre. Inner wallhead and cross walls marking near-continuous mono pitch roof (now gone, 1996); modern flat roofed shed built in W corner. Statement of Special Interest; A remarkably intact survivor of this rare building type. The pund is of particular interest as an example of an unusual building type indicative of Shetland agricultural practice in the 19th century. The only comparable steadings can be found at Garth (also Delting), Gungstie (Bressay) and Kirkabister (Yell).

Asset/Event Number	43
Asset/Event Name	Swinister, Swinister Old Haa, Including Wall
Type of Asset/Event	Building
Date and/or Period	18th Century
Listing No./NRHE Number	LB44534
HER Number	232114
Status	Listed Building - Category B
Easting	444966
Northing	1172594
Parish	Delting
Council	Shetland Islands
Description	Late 18th century. Single storey and attic, 3-bay symmetrical laird's house. Harl-pointed rubble walls. E (PRINCIPAL) ELEVATION: symmetrical, door centred at ground with windows in flanking bays and high blank wallhead above. W (REAR) ELEVATION: small window centred at ground with door adjacent to left and high blank wallhead above. Grey slate roof with skylights to attic. Stone copes to substantial harled apex stacks and skews. INTERIOR: unseen 1996. WALL: haa enclosed by random rubble wall, lower (with cope) to E. Statement of Special Interest; Presiding over Swinister Voe, the Old Haa sits at the end of an ayre like other haas in the northern mainland forming a strong visual and historic focus in this spectacularly scenic area. Swinister Old Haa is a rare survivor of late 18th century Shetland life, being single storey with a high wallhead concealing an attic which has not been altered by the addition of dormers.

Asset/Event Number	44
Asset/Event Name	Ulsta, Pier House
Type of Asset/Event	House
Date and/or Period	19th Century
Listing No./NRHE Number	LB18679
HER Number	157382
Status	Listed Building - Category C
Easting	446306
Northing	1179551
Parish	Yell
Council	Shetland Islands
Description	Later 19th century. Single storey and loft 5-bay symmetrical former pier building (now shop), of

rectangular plan. Harled and painted rubble walls with painted margins to doors and windows. SE (PRINCIPAL) ELEVATION: symmetrical, 2-leaf flush-beaded timber door with 2-pane fanlight at ground in centre bay; 16-pane timber fixed-light shop windows in flanking bays; 2-leaf flush-beaded timber doors with plate glass fanlights in outer bays. 4-pane timber sash and case windows and stone dormerheads to dormers breaking eaves between bays flanking centre. SW GABLE: 4-pane timber fixed-light to right at ground, harled former stair landing with parapet projecting at outer left; vertically-boarded timber loft door in gablehead at centre with stugged sandstone corbels supporting timber platt. Purple-grey slate roof with concrete skew-copes. Rendered single-flue gablehead stacks with copes and circular cans. Statement of Specialist Interest; A photograph of 1905 shows an open timber stair leading from the road to the loft door in the SW gable. The harled former landing suggests that this stair was replaced in the 20th century by a dog-leg arrangement leading from the yard. A photograph from the early 1970s shows the 4-bay rear elevation to be near-symmetrical, with a shouldered wallhead stack breaking the eaves in the centre, and a margined 12-pane timber sash and case window in each bay except for that to the outer right which is blank. Still in commercial use, this building is a rare surviving example of a once common focus at a Shetland pier.

Asset/Event Number	45
Asset/Event Name	Mossbank, Erlangen Including Garden Wall
Type of Asset/Event	House
Date and/or Period	19th Century
Listing No./NRHE Number	LB44529
HER Number	232109
Status	Listed Building - Category C
Easting	445021
Northing	1175602
Parish	Delting
Council	Shetland Islands
Description	Early 19th century. 2 storey and attic, 3 bay symmetrical house. Harl pointed rubble walls with stugged and droved sandstone ashlar dressings. Projecting cills at windows. E (PRINCIPAL) ELEVATION: symmetrical; gabled porch projecting in centre bay, windows in flanking bays and regular fenestration at 1st floor. S GABLE: blank with raggle of former single storey outbuilding. W (REAR) ELEVATION: single storey rubble lean to at ground; border glazed stair window only centred at 1st floor. Modern glazing throughout. Purple grey slate roof; cement rendered skew copes with bracketted skewputts. Coped rubble stacks with circular cans. GARDEN WALL: rubble dwarf wall to road, built up in block where railings removed; rubble wall enclosing garden to S and E, and incorporating gable of former outbuilding. Statement of Special Interest; A good quality house that forms a striking group with Mossbank Haa (see separate listing), on the approach to the old pier.

Asset/Event Number	46
Asset/Event Name	Mossbank, Mossbank Bod
Type of Asset/Event	Bod
Date and/or Period	19th Century
Listing No./NRHE Number	LB44530
HER Number	232112
Status	Listed Building - Category C

Easting	445367
Northing	1174727
Parish	Delting
Council	Shetland Islands
Description	BOD: early 19th century. 2 storey, 3 bay symmetrical rubble trading booth. Battered walls, door centring W elevation with 4 pane hoppered windows in flanking bays. Corrugated sheet cladding with concrete skew copes to roof. Timber upper floor surviving within. Roofless outbuilding adjoining to rear (E) with door in S elevation, wallhead built up in block. Statement of Special Interest; Although this building no longer plays such a significant role in Shetland's association with the sea, it forms a picturesque group with the neighbouring lighthouse (see separate listing), that is visible from all around, Firths Voe, and a reminder of Shetland's strong historical association with the sea.

Asset/Event Number	47
Asset/Event Name	Mossbank, Mossbank Haa, including Outbuildings and Wall
Type of Asset/Event	Buildings
Date and/or Period	18th Century
Listing No./NRHE Number	LB44531
HER Number	232107
Status	Listed Building - Category C
Easting	445081
Northing	1175609
Parish	Delting
Council	Shetland Islands
Description	18th century. 2 storey and attic 3 bay asymmetrical house with single storey wings to S. Smooth rendered and whitewashed walls. N (PRINCIPAL) ELEVATION: asymmetrical; variety of windows at ground, regularly fenestrated at 1st floor with narrow windows. E GABLE: gable of former outbuilding with door at centre, projecting to left of centre, and extending left and linking to gabled rear wing. W GABLE: single window at ground to right of centre; rubble wall extending to right, enclosing courtyard and terminated to S by single- storey 3-bay piend-roofed harled rubble outbuilding with lean-to at N end. S (REAR) ELEVATION: regular fenestration at 1st floor. Modern glazing and grey tile roof to house and E wing; 4-pane timber fixed-lights and felted roof to W wing. Harled apex stacks with stone copes and circular cans to principal gables; harled apex stack with thackstanes and circular can to S gable of E wing. Statement of Special Interest; Although substantially altered, this is a historic building that retains much of its original character and also forms part of an interesting group at the pier.

Asset/Event Number	48
Asset/Event Name	Mossbank, Mossbank Lighthouse
Type of Asset/Event	Lighthouse
Date and/or Period	Modern
Listing No./NRHE Number	LB44532
HER Number	157550
Status	Listed Building - Category C

Easting	445377
Northing	1174718
Parish	Delting
Council	Shetland Islands
Description	Metal tower on concrete plinth, octagonal shaft rising to balcony with handrail around circular lantern comprised of apron, curved glass and conical roof with domed ventilator. Felt roofed timber shed adjacent, cable stayed to concrete pads. Statement of Special Interest; This building forms a picturesque group with the neighbouring bod (see separate listing), visible from around Firths Voe, and it is a reminder of Shetland's strong historical association with the sea.

Asset/Event Number	49
Asset/Event Name	Toft, Norse Mill
Type of Asset/Event	Horizontal Mill
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	1226
Status	Non-Designated Heritage Asset
Easting	443550
Northing	1176090
Parish	Delting
Council	Shetland Islands
Description	19th century or earlier. The ruin of a side-entrance mill. The mill that Hume notes at HU 434 762 cannot be identified on the 1971 edition of the OS 1:2500 map. Rectangular enclosures at HU 434 763 appear to be planticrubs.

Asset/Event Number	50
Asset/Event Name	Tofts Voe, Hand Winch
Type of Asset/Event	Winch
Date and/or Period	Modern
Listing No./NRHE Number	
HER Number	1227
Status	Non-Designated Heritage Asset
Easting	443580
Northing	1176160
Parish	Delting
Council	Shetland Islands
Description	Hand Winch.

Asset/Event Number	51
Asset/Event Name	Garth, Chapel And Graveyard
Type of Asset/Event	Burial Ground, Chapel, Font
Date and/or Period	Medieval
Listing No./NRHE Number	
HER Number	1234
Status	Non-Designated Heritage Asset
Easting	441700
Northing	1172860
Parish	Delting
Council	Shetland Islands
Description	In the middle of the grave-yard is generally known to be the site of an ancient Romish chapel. The grave-yard is considered to be as old as the chapel although still in use. There are no structural remains on this site. Until recently, however, part of a roughly shaped basin of stone lay outside the wall of the neighbouring grave-yard. It has now been removed to Graven for preservation.

Asset/Event Number	52
Asset/Event Name	Sodles Burn
Type of Asset/Event	Site
Date and/or Period	Unknown
Listing No./NRHE Number	
HER Number	1236
Status	Non-Designated Heritage Asset
Easting	443200
Northing	1173500
Parish	Delting
Council	Shetland Islands
Description	Sodles Burn.

Asset/Event Number	53
Asset/Event Name	Firth
Type of Asset/Event	Horizontal Mill
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	70994
Status	Non-Designated Heritage Asset
Easting	443370
Northing	1173700

Parish	Delting
Council	Shetland Islands
Description	Only a pile of rubble remains.

Asset/Event Number	54
Asset/Event Name	Neshion
Type of Asset/Event	Clearance Cairn, Quern, Unidentified Pottery
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	109524
Status	Non-Designated Heritage Asset
Easting	443600
Northing	1176400
Parish	Delting
Council	Shetland Islands
Description	Clay potsherd; small steatite grits, buff exterior, grey interior. Found at previously unnotified site, S of Neshion, E of Toft. Also part of trough quern in clearance cairn at this site.

Asset/Event Number	55
Asset/Event Name	Laxobigging
Type of Asset/Event	Anti Aircraft Battery
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	114942
Status	Non-Designated Heritage Asset
Easting	442180
Northing	1172810
Parish	Delting
Council	Shetland Islands
Description	To the N of the road from Mossbank to Laxobigging RAF Camp near a break in the angle of a fence is a small anti-aircraft battery. A concrete base with a holdfast for either a 3-inch or bofors gun can be seen, as well as traces of the magazines with an earthed bank around the perimeter.

Asset/Event Number	56
Asset/Event Name	Graven, Laxobigging Camp
Type of Asset/Event	Military Camp
Date and/or Period	WW2

Listing No./NRHE Number	
HER Number	114943
Status	Non-Designated Heritage Asset
Easting	441500
Northing	1173100
Parish	Delting
Council	Shetland Islands
Description	This large former RAF military camp which served both Sella Ness Flying Boat Base and Scatsa Airfield survives on either side of the road from Firth to Garths Voe. Many brick, concrete, wood and asbestos buildings survive including the camp cinema, most in poor condition. The remains of this large military camp are visible on vertical air photographs (OS 67 176, 2 805- 2 806, flown 12 June 1967), which show the extensive layout of hut platforms, buildings and other structures. An area of covering about 39 hectares on both sides of the Burn of Laxobigging, from the coast to where a minor road crosses the burn. Within the remains can be found the cinema, squash court, engine houses, officer's mess and the hut bases of over 170 huts. In some instances the huts have been re-used and the sites of others have had new houses built on them. The small bridges over the Burn of Laxobigging have been replaced with strengthened concrete structures. The construction of the camp removed some existing farmsteads, notably Toftens (HU47SW 14). A complete site plan of both the camp and the Sullom Voe Flying Boat base (HU37NE 8) dated February 1946 is available at the RAF Museum, Hendon.

Asset/Event Number	57
Asset/Event Name	Garth
Type of Asset/Event	Building(s), Saddle Quern
Date and/or Period	Medieval
Listing No./NRHE Number	
HER Number	123603
Status	Non-Designated Heritage Asset
Easting	441170
Northing	1174540
Parish	Delting
Council	Shetland Islands
Description	Medieval house immediately to S of the Haa of Garth. Gable-on to slope, with outbuilding on E side with interconnecting doorway. House is 11.3 x 4.3m, outhouse 6.4 x 3.3m. In rubble of Haa is a saddle quern formerly built into wall.

Asset/Event Number	58
Asset/Event Name	Graven, Laxobigging Camp
Type of Asset/Event	Chapel, Cinema, Gymnasium
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142327

Status	Non-Designated Heritage Asset
Easting	441743
Northing	1172816
Parish	Delting
Council	Shetland Islands
Description	The wartime combined gymnasium/cinema, church and chapel is constructed of concrete, breeze blocks and brick. It measures about 44.1m by 8.8m overall and retains roofed sections at the SW and NE ends. The two-storey entrance block extension with projection room is at the SW end and retains concrete stairs to the upper floor. The projection block was built with 9-inch walls for fire protection. Two doorways survive in the SW-facing gable of the projection block and a further smaller square section has been cut out of the wall between the doors. The main section of the roof, which would have had either steel or all-timber roof trusses, has been removed and both walls are butressed both internally and externally. The building was built as a gymnasium/cinema to design no.16428/40 with a projection room extension design no. 889/42 with seating for about 370 personnel and includes a Roman Catholic church extension. The building is now in use as a sheepfold and low concrete walls have been built on the main floor to provide pens for the animals.

Asset/Event Number	59
Asset/Event Name	Graven, Laxobigging Camp
Type of Asset/Event	Water Tank(s)
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142328
Status	Non-Designated Heritage Asset
Easting	441569
Northing	1172708
Parish	Delting
Council	Shetland Islands
Description	Concrete and shuttered concrete structures, one of which is a reservoir and filter, the other two being the filter house and sedimentation tank are situated on the hillside above the minor road which runs through Laxobigging Camp. In addition several concrete sumps, drains and pipes can also be seen in the immediate area. The base of the filtration house survives with a flight of concrete steps on the NE side. A further hut at HU 41427 72632, which was not examined on the date of visit, was for the crew of a hispano anti-aircraft machine gun. There is also a concrete built ram pump and pumping plant at HU 41713 72740 and HU 41714 72722 respectively.

Asset/Event Number	60
Asset/Event Name	Graven, Laxobigging Camp, Officers Mess
Type of Asset/Event	Air Raid Shelter, Hotel, Mess
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142329

Status	Non-Designated Heritage Asset
Easting	441017
Northing	1173192
Parish	Delting
Council	Shetland Islands
Description	The former Officers' Mess, now annotated 'Old Hae' on the current OS 1:25000 scale Explorer map is situated in the centre of a small village named Graven. The buildings comprise a group of concrete and brick huts almost F-shaped in plan and all harled. At the NW corner is a tower for the water tank and chimney. At the entrance are two low walls with short pillars. All buildings have corrugated iron roofs. Internally, the layout of the building has been heavily rebuilt after conversion to the 'Sullom Voe' hotel and little survives of the original room plan. Immediately to the W is an air-raid shelter.

Asset/Event Number	61
Asset/Event Name	Graven, Laxobigging Camp
Type of Asset/Event	Engine House
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142330
Status	Non-Designated Heritage Asset
Easting	441200
Northing	1173213
Parish	Delting
Council	Shetland Islands
Description	A rectangular engine house is situated on a track leading about 121m due E from Graven. The building measures 11.5m by 8m and is built of brick and harled. The pitched roof, which is possibly a replacement is of corrugated iron. The entrance, which has been enlarged, is in the W gable end where there are a further six openings for windows. The brickwork has been exposed on one elevation. When active the power house contained two 60KW sets.

Asset/Event Number	62
Asset/Event Name	Graven, Laxobigging Camp, Septic Tanks
Type of Asset/Event	Water Tank(s)
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142332
Status	Non-Designated Heritage Asset
Easting	440965
Northing	1173682
Parish	Delting
Council	Shetland Islands

Description	Three shuttered concrete tanks with curved pipe breathers are situated adjacent to the Burn of Laxobigging about 124m SE of where it disgorges into the sea. The tanks are annotated as septic on the RAF Museum site plan. The centre tank has had a hole broken through the concrete and all three have a additional block at roof level on their S side.

Asset/Event Number	63
Asset/Event Name	Graven, Laxobigging Camp, Officers' Ablutions
Type of Asset/Event	Ablutions Block
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142334
Status	Non-Designated Heritage Asset
Easting	441056
Northing	1173065
Parish	Delting
Council	Shetland Islands
Description	Situated about 103m S of the Officers' Mess (HU47SW 8.04) is what was formerly the officers' ablutions hut. Now unroofed and the only standing building in the area. It has at least four compartments and retains smaller divisions within. The building lies amongst many concrete hut bases. About 37m to the S is the brick built remains of a small block of latrines.

Asset/Event Number	64
Asset/Event Name	Graven, Laxobigging Camp, Meteorological Office
Type of Asset/Event	Nissen Hut
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142336
Status	Non-Designated Heritage Asset
Easting	440963
Northing	1173236
Parish	Delting
Council	Shetland Islands
Description	The former meteorological office for RAF Scatsta and Sella Ness is situated to the NE of the sharp bend in the road at Graven. The rectangular hut measures 10.1m by 5.3m NW - SE overall and is built of brick and breeze blocks. The walls are buttressed throughout and the roofing material has been removed to reveal the sarking. Windows have been cut through both elevations and the gable ends. Some of the metal window frames survive. The entrance is in the SW-facing elevation, which is accessed via a concrete path.

Asset/Event Number	65
Asset/Event Name	Graven, Laxobigging Camp, Gun Turret Trainer

Type of Asset/Event	Building
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142337
Status	Non-Designated Heritage Asset
Easting	441170
Northing	1173195
Parish	Delting
Council	Shetland Islands
Description	A type A Standard Free Gunnery/Turret Trainer (pattern no.11023/40) is situated about 18m E of the Burn of Laxobigging, E of the small village of Graven. Measuring about 8m square and built of breeze blocks with a corrugated iron pitched roof. The entrance is in the NE elevation with two small windows cut and ventilator grill through on each side. There is a single buttress on each side of the entrance. A small outshot on the NE gable has been removed.

Asset/Event Number	66
Asset/Event Name	Graven, Laxobigging Camp, Squash Racket Court
Type of Asset/Event	Building
Date and/or Period	WW2
Listing No./NRHE Number	
HER Number	142338
Status	Non-Designated Heritage Asset
Easting	441096
Northing	1173167
Parish	Delting
Council	Shetland Islands
Description	The camp squash racket court is situated on the E side of the road at the S end of Graven village. Built of brick and rendered concrete it measures 10.2m by 7.6m overall and has a pitched roof. The bulding is externally buttressed on all elevations and gables. The roof has been recently renewed and a large door opening has been cut through the SW-facing gable. The original building would have had an entrance in the middle of a single storey annex attached to the SW gable which has now been removed.

Asset/Event Number	67
Asset/Event Name	Laxobigging, Graven
Type of Asset/Event	Building
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	152449
Status	Non-Designated Heritage Asset
Easting	441055

Northing	1173212
Parish	Sandsting
Council	Shetland Islands
Description	Building predating Laxobigging Military Camp, used as part of Officers Mess and later as part of the Sullom Voe Hotel. One and half storey cottage with two storey canted bays. Crenellated entrance porch with dormer above. Felt tiles on the roof and chimney stacks at each end. Extensions to rear. Depicted as roofed on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), probably late 18th or early 19th century.

Asset/Event Number	68
Asset/Event Name	Tofts Voe, Ferry Pier
Type of Asset/Event	Pier
Date and/or Period	Modern
Listing No./NRHE Number	
HER Number	157367
Status	Non-Designated Heritage Asset
Easting	443680
Northing	1176130
Parish	Delting
Council	Shetland Islands
Description	Ferry Pier.

Asset/Event Number	69
Asset/Event Name	Out-Town
Type of Asset/Event	Head Dyke, Township
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189655
Status	Non-Designated Heritage Asset
Easting	443660
Northing	1177780
Parish	Delting
Council	Shetland Islands
Description	A township comprising four unroofed buildings, four roofed buildings, one enclosure and a head-dyke is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). One unroofed building, two enclosures and the head-dyke are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	70

Asset/Event Name	Toog
Type of Asset/Event	Building, Enclosure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189656
Status	Non-Designated Heritage Asset
Easting	443779
Northing	1177176
Parish	Delting
Council	Shetland Islands
Description	One unroofed building is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	71
Asset/Event Name	Clett
Type of Asset/Event	Building, Farmstead
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189657
Status	Non-Designated Heritage Asset
Easting	443500
Northing	1177040
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising two roofed buildings and one enclosure, and an unroofed building lying approximately 100m to the N are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). One roofed building and one enclosure are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	72
Asset/Event Name	Gardins
Type of Asset/Event	Building, Enclosure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189658
Status	Non-Designated Heritage Asset
Easting	443770
Northing	1176870
Parish	Delting

Council	Shetland Islands
Description	Four unroofed buildings, one of which has an attached enclosure, are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but they are not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	73
Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Mill
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189659
Status	Non-Designated Heritage Asset
Easting	440430
Northing	1175800
Parish	Delting
Council	Shetland Islands
Description	One unroofed building annotated Mill is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	74
Asset/Event Name	Garth House
Type of Asset/Event	Building, Farmstead, Head Dyke
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189660
Status	Non-Designated Heritage Asset
Easting	440500
Northing	1174600
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising three unroofed buildings, one partially roofed building and two enclosures, and a head-dyke are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). The fragmentary remains of the head-dyke are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	75
Asset/Event Name	Garth House
Type of Asset/Event	Building(s)

Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189661
Status	Non-Designated Heritage Asset
Easting	441100
Northing	1174250
Parish	Delting
Council	Shetland Islands
Description	Two unroofed buildings lying approximately 100m apart are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but they are not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	76
Asset/Event Name	Laxobigging
Type of Asset/Event	Farmstead
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189662
Status	Non-Designated Heritage Asset
Easting	441340
Northing	1173250
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising one unroofed building, two roofed buildings and two enclosures is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983). This site lies within the disused camp of Laxobigging (HU47SW 8.00).

Asset/Event Number	77
Asset/Event Name	Bordigarth
Type of Asset/Event	Farmstead, Head Dyke
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189663
Status	Non-Designated Heritage Asset
Easting	442010
Northing	1173490
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising three unroofed buildings and one enclosure, and a head-dyke are

	depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). One unroofed buidling is shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	78
Asset/Event Name	Bordigarth
Type of Asset/Event	Enclosure(s), Structure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189664
Status	Non-Designated Heritage Asset
Easting	441840
Northing	1173380
Parish	Delting
Council	Shetland Islands
Description	One unroofed structure and two attached enclosures are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). One unroofed structure is shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	79
Asset/Event Name	Laxobigging
Type of Asset/Event	Farmstead
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189665
Status	Non-Designated Heritage Asset
Easting	441600
Northing	1173100
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising three unroofed buildings and one enclosure is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983). This site lies within the disused camp of Laxobigging (HU47SW 8.00). The site of Toftens was probably destroyed by the construction of the airmens dining room, which formed part of the large military camp at Laxobigging. The large E-shaped hut was built to accommodate 1400 personnel.

Asset/Event Number	80
Asset/Event Name	Stenswall
Type of Asset/Event	Farmstead
Date and/or Period	Post Medieval

Listing No./NRHE Number	
HER Number	189666
Status	Non-Designated Heritage Asset
Easting	442560
Northing	1172860
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising two unroofed buildings and two conjoined enclosures is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). One unroofed building and two enclosures are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	81
Asset/Event Name	Laxobigging
Type of Asset/Event	Farmstead, Head Dyke
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189667
Status	Non-Designated Heritage Asset
Easting	441760
Northing	1172700
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising one unroofed building and two enclosures, and a head-dyke are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but they are not shown on the current edition of the OS 1:10000 map (1983). This site lies within the disused camp of Laxobigging (HU47SW 8.00).

Asset/Event Number	82
Asset/Event Name	Laxobigging
Type of Asset/Event	Building
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189668
Status	Non-Designated Heritage Asset
Easting	441620
Northing	1172820
Parish	Delting
Council	Shetland Islands
Description	One unroofed building is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland

	(Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	83
Asset/Event Name	Laxobigging
Type of Asset/Event	Farmstead
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189669
Status	Non-Designated Heritage Asset
Easting	441550
Northing	1172890
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising one unroofed long building of three compartments and an attached enclosure is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	84
Asset/Event Name	Laxobigging
Type of Asset/Event	Structure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189670
Status	Non-Designated Heritage Asset
Easting	441430
Northing	1172960
Parish	Delting
Council	Shetland Islands
Description	One unroofed structure is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	85
Asset/Event Name	Graven
Type of Asset/Event	Building
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189671

Status	Non-Designated Heritage Asset
Easting	441030
Northing	1173040
Parish	Delting
Council	Shetland Islands
Description	One unroofed building is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but it is not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	86
Asset/Event Name	Toft
Type of Asset/Event	Structure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189672
Status	Non-Designated Heritage Asset
Easting	443430
Northing	1176350
Parish	Delting
Council	Shetland Islands
Description	Five unroofed structures are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but they are not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	87
Asset/Event Name	Booth of Toft
Type of Asset/Event	Building, Structure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189673
Status	Non-Designated Heritage Asset
Easting	443570
Northing	1176170
Parish	Delting
Council	Shetland Islands
Description	One unroofed building and one unroofed structure are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv), but they are not shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	88
Asset/Event Name	Tofts Voe
Type of Asset/Event	Farmstead, Head Dyke, Structure
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189674
Status	Non-Designated Heritage Asset
Easting	443630
Northing	1175930
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising two roofed buildings and one enclosure, one unroofed structure and a head-dyke are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). The head-dyke is conjoined to that of the farmstead of Heogs (HU47NW 29). One unroofed building and the head-dyke are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	89
Asset/Event Name	Tofts Voe
Type of Asset/Event	Farmstead, Head Dyke
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189675
Status	Non-Designated Heritage Asset
Easting	443620
Northing	1175790
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising two unroofed buildings, one roofed building and one enclosure, one unroofed structure and a head-dyke are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). The head-dyke is conjoined to that of the farmstead of North Heogs (HU47NW 28). Two unroofed buildings and the head-dyke are shown on the current edition of the OS 1:10000 map (1983).

Asset/Event Number	90
Asset/Event Name	Crooksetter
Type of Asset/Event	Farmstead, Head Dyke
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189727
Status	Non-Designated Heritage Asset

Easting	440730
Northing	1176740
Parish	Delting
Council	Shetland Islands
Description	A farmstead comprising three unroofed buildings and three enclosures, one of which has four compartments, and the fragmentary remains of a head-dyke are depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). Two unroofed buildings and six enclosures are shown on the current edition of the OS 1:10000 map (1983). The Orkney Research Centre for Archaeology (ORCA) was commissioned by Xodus Ltd on behalf of the client, Chevron North Sea Limited (Chevron) to conduct an archaeological walkover survey in the areas of Calbeck Ness and Mio Ness, Shetland, which may be affected by proposed pipeline routes. The survey fieldwork was undertaken by two members of ORCA staff between 2nd July 2012 and 6th July 2012. The Rosebank walkover survey has revealed a total of 38 sites, ranging in importance from negligible/low (modern or post medieval farm features) to potentially high in the case of possible prehistoric features present. The sites are concentrated over the eastern side of the survey area along the coastline towards Mio Ness (Sites 027 - 034), though there are a few scattered around the Calbeck Ness Area (Sites 013 - 016). A concentrated series of sites, thought to be associated with the known site of Crooksetter Farm (NMRS: HY47NW18) is located directly to the east of the Vadill (Sites 005, 006 and 007).

Asset/Event Number	91
Asset/Event Name	Tronaster
Type of Asset/Event	Township
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	189728
Status	Non-Designated Heritage Asset
Easting	442400
Northing	1176500
Parish	Delting
Council	Shetland Islands
Description	What may be a small township comprising two unroofed long buildings and two enclosures is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). Two unroofed buildings and two enclosures are shown on the current edition of the OS 1:10000 map (1983), but one of the enclosures is at a different location to that on the 1st edition.

Asset/Event Number	92
Asset/Event Name	Toft Village
Type of Asset/Event	Village
Date and/or Period	Unknown
Listing No./NRHE Number	
HER Number	187274
Status	Non-Designated Heritage Asset

Easting	443300
Northing	1175700
Parish	Delting
Council	Shetland Islands
Description	Toft Village.

Asset/Event Number	93
Asset/Event Name	Sand Water
Type of Asset/Event	Sheepfold
Date and/or Period	Unknown
Listing No./NRHE Number	
HER Number	345485
Status	Non-Designated Heritage Asset
Easting	442290
Northing	1174657
Parish	Delting
Council	Shetland Islands
Description	Sheepfold.

Asset/Event Number	94
Asset/Event Name	Islesview
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363620
Status	Non-Designated Heritage Asset
Easting	443716
Northing	1177424
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	95
Asset/Event Name	The Brough
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	

HER Number	363621
Status	Non-Designated Heritage Asset
Easting	443787
Northing	1177293
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	96
Asset/Event Name	Toog
Type of Asset/Event	Building, Enclosure
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363622
Status	Non-Designated Heritage Asset
Easting	443845
Northing	1177000
Parish	Delting
Council	Shetland Islands
Description	Building and Enclosure.

Asset/Event Number	97
Asset/Event Name	Neshion
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363623
Status	Non-Designated Heritage Asset
Easting	443766
Northing	1176647
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	98
Asset/Event Name	The Brough
Type of Asset/Event	Farmstead

Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363616
Status	Non-Designated Heritage Asset
Easting	443621
Northing	1177520
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	99
Asset/Event Name	Giffords Fancy
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363617
Status	Non-Designated Heritage Asset
Easting	443843
Northing	1177223
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	100
Asset/Event Name	Toog
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363618
Status	Non-Designated Heritage Asset
Easting	443733
Northing	1176981
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	101

Asset/Event Name	Quoys of Toft
Type of Asset/Event	Farmstead
Date and/or Period	19th Century
Listing No./NRHE Number	
HER Number	363619
Status	Non-Designated Heritage Asset
Easting	443524
Northing	1176705
Parish	Delting
Council	Shetland Islands
Description	Farmstead.

Asset/Event Number	102
Asset/Event Name	Hill of Crooksetter
Type of Asset/Event	Archaeological Evaluation
Date and/or Period	N/A
Listing No./NRHE Number	
HER Number	315153
Status	Event
Easting	440600
Northing	1176300
Parish	Delting
Council	Shetland Islands
Description	Archaeological Evaluation (March 2010 - September 2011); A series of evaluations was undertaken, March 2010–September 2011, of features identified during previous work (DES 2010, 157–8), in advance of the construction of a gas pipeline, processing plant and associated infrastructure at Sullom Voe in Delting. Two evaluation trenches were excavated over linear earthworks at Garth Hill dyke (Trench 1 – HU 41168 74768) and Crooksetter Hill dyke (Trench 2 – HU 40718 76399). A survey of the full extent of the Crooksetter dyke was also undertaken as the feature would be significantly affected by the development. The excavations indicated that the dykes appear to have been built from cut turf and peat. A detailed examination of the construction and stratigraphy of the earthworks was undertaken using thin section soil micromorphological analysis on samples from the profiles of both trenches. In Trench 1 there was a marked change in soil features and microstructure which suggests that material from elsewhere was used in the construction of the dyke. Given the variance in local geology, these introductions may have been local in origin. As the microstructure was distinctly different to what lies beneath the earthwork, it appears that there was one single phase of construction. The uniformity observed may imply that a solid section was sampled from amongst a mosaic of turf, or that the repair and additions to the earthwork consisted of the removal and rearrangement of the turf. The microhorizons identified indicated that water borne material was being introduced to the site with varying levels of energy. This may reflect isolated erosion events, or perhaps evidence of nearby degradation, possibly induced by the removal of vegetation. The absence of mineral lenses in the upper horizons of the trench appears to suggest that the landscape became more stable. The presence of mineral lenses in Trench 2 suggests that this neighbouring location was subject to slightly differing landscape processes. As the organic matter continues to develop episodes of sand blow may explain these mineral inclusions. No artefacts were recovered from either trenches, which makes their dating

problematic. However, given their associations with the townships of Garth and Crooksetter, they are likely to be post-medieval, although an earlier date cannot be ruled out. A magnetometer survey of the N part of the footprint of the gas processing plant identified seven anomalies of potential interest, of which four (23, 24, 25 and 27) were recommended for further evaluation. A total of nine trenches were excavated across these anomalies. Trenches 1, 4 and 5 investigated anomaly 25, which was found to be a spread of sub-rounded cobbles and boulders, probably natural in origin. Trenches 2 and 4 were located over anomalies 24 and 27, both of which were the result of natural soil processes. Linear geophysical anomaly 23 was explored by Trenches 6, 7, 8 and 9 and was revealed to be a natural channel, which in Trenches 7 and 8 was sealed by a stone and turf field boundary. This boundary is probably post-medieval in date, and forms part of a sub-rectangular enclosure associated with Crooksetter Farmstead. An evaluation to investigate a potential linear feature was also undertaken at the Hill of Garth (HU 41540 73933). The excavation confirmed that the geophysical anomaly was a natural formation of manganese panning within a shallow linear depression on the ancient peat surface. Excavation (November 2010 - January 2011); HU 40726 76192 An excavation was undertaken November 2010–January 2011 to investigate a group of features discovered during the monitoring of large-scale peat stripping just to the N of Sullom Voe Terminal. The peat stripping was part of ground preparation work associated with the construction of a gas processing plant. The excavation focused on a c5m N–S by 3.5m E–W area of charcoal-rich deposits, located in sub-peat layers, close to the remains of a substantial dyke of large granite boulders. The area is located c20m SW of a previously excavated series of Neolithic or Bronze Age structures (Site 002). The excavation recorded c1.5m of peat overlying two possibly colluvial layers, overlying a sealed a series of layers derived from a major burning event. These deposits consisted of an upper brownish red horizon derived from oxidised fuel ash, which sealed a lower very dark greyish brown charcoal-rich horizon. The horizons were contemporary and related to the upper well oxidised portion of the fire, with the lower horizon formed under reducing conditions, which lead to the incomplete combustion of the fuel source. A significant assemblage of artefacts was recovered from the site, including pot, worked quartzite, worked stone (including felsite), pumice, burnt bone, and cramp (vitrified fuel ash slag). The most significant finds were two polished felsite axes. Initial analysis of the charred plant remains has revealed a very large assemblage of charcoal, and a significant quantity of barley. A full interpretation of the site awaits the completion of post-excavation analysis. However, initial hypotheses include the possibility that the feature may have been a cremation pyre, with the artefacts placed as pyre goods. However, an initial assessment of the burnt bone suggests it is animal rather than human. Alternatively, it may have been the site of a large, deliberately lit fire associated with food consumption or other activities. Equally, it could be the burnt remains of a structure, which could explain the comparatively large assemblage of artefacts. Whatever the origin of the fire the presence of cramp indicates that the fire reached a very high temperature. The stratigraphy of the burnt remains strongly suggests that they reflect a single burning event. The burnt feature was bounded to the E by a curvilinear stone enclosure dyke, which also appears to surround the Neolithic/Bronze Age house and funerary structures. The ephemeral remains of two curvilinear stone features, associated with the enclosure dyke, were also recorded during the excavations. These post-date the dyke, but all three features were probably broadly contemporary. It is possible that they represent the remains of double faced walls, which may have formed internal divisions within the enclosure. Excavation (2010); A watching brief was carried out August–October 2010 during peat stripping prior to the construction of a gas processing plant. During the work a series of archaeological features was discovered underlying c15m of peat on a terrace on the gentle lower slope of Crooksetter Hill. Structure A was the remnants of a possible Neolithic or Early Bronze Age structure measuring c7m in diameter. The structure was built of granite boulders, some of which were fairly substantial, particularly at its northern end. The building seemed to have been constructed on an old ground surface which had formed on glacial till. The NW wall of the building was the best preserved part, measuring 1.3m at its widest point. This wall was more fragmentary elsewhere and it is possible that the stone had been robbed during the construction of later structures around it. A hearth, which appeared to have been repaired and remodelled several times and a recess, which had been created against the NW wall, were recorded inside the building. A series of occupation deposits, rich in charcoal, had also been preserved. These deposits were better preserved, or confined to, the central and southern areas of the building. A series of hillwash deposits overlay and effectively sealed Structure A. An oval structure constructed of coursed masonry with a paved base was recorded c4m NW of Structure A. A spread of stone was recorded extending from the top of the chamber and some of this may

represent tumble, possibly from the cairn material which overlay the feature. However, some of the stone formed a kerbed edge and this feature, Structure B, probably represented a cist, although no human remains were recovered. A 'heel'-shaped cairn, was recorded to the S of Structure A. Parts of the cairn (Structure C) overlay the hillwash while other parts were built on a later layer of peat. The S part of Structure C was built of large boulders with smaller stone packing, while on the N side the stone was much larger, a variation which gave the structure a less coherent overall form. The cairn had a neat façade and some parts to the rear of the structure were faced with orthostats. On its SE side was an inner horseshoe-shaped chamber. This small chamber contained large amounts of pottery, largely confined to its N side. The variable quality of the construction of Structure C and its construction on different surfaces, may suggest that this monument underwent modification over time. Two slots excavated through the cairn revealed that some of the deposits associated with Structure A appeared to continue beneath it. Lying just S of Structure C, and again post-dating Structure A, was a beautifully constructed trapezoidal stone-built feature, Structure D. This structure was topped with a layer of white quartz pebbles. Although the form and careful construction of this feature suggested that it may be a funerary monument, such as a cist, it was fairly shallow in nature and no human remains were recovered. Chemical analysis of soil samples from within this feature may indicate otherwise. A further possible cist, Structure E, immediately W of Structure D, had been badly truncated on its western edge by peat cutting. A kerbed structure to the W of Structure B was associated with rich anthropogenic deposits, including possible in situ burning and dense charcoal patches. However, this feature had been truncated during peat stripping making interpretation difficult. Other features revealed to the N of the main site included a substantial boulder boundary wall, which appeared to form a circuit around the N, E and S of the main site. Further spreads of stone recorded between the main site and the boundary wall were also investigated, including a possible multi-cellular structure and a further cairn with an inner chamber and outer kerb. Excavation (April 2011); HU 40583 76233 An excavation was undertaken in April 2011 to investigate a feature discovered during the monitoring of large-scale peat stripping NE of Sullom Voe Terminal. The peat stripping was part of ground preparation work associated with the construction of a gas processing plant. The excavation focused on a large sub-circular stone dyke enclosure within sub-peat layers on the W slope of the Hill of Crooksetter. The area is located c100m NW of a previously excavated series of Neolithic or Bronze Age remains (Sites 002 and 003). The sub-circular enclosure measured c30 x 40m, had a possible entrance on its S side and was constructed from psammite and granite boulders. No internal features, structural remains or artefacts were found. All deposits appear to have been derived from natural processes and this combined with the absence of material remains suggest that it may have been an enclosure for livestock. No datable material was recovered, but the site's stratigraphic position beneath the peat, strongly suggest a prehistoric date, and it may be contemporary with sites 002 and 003. Excavation (May 2011 - August 2011); HU 43960 73624 A programme of archaeological work was undertaken May–August 2011 on the site of Mound 105, a feature identified during previous work (DES 2010, 157–8), in advance of the construction of a gas pipeline, processing plant and associated infrastructure at Sullom Voe in Delting. The site was surveyed and four evaluation trenches excavated, focusing on geophysical anomalies identified in the 2010 survey. The mound was found to be a natural outcrop of bedrock; however, the remains of a Neolithic/Early Bronze Age settlement (Structure A) were recorded in Trench 2 on a level area on the S side of the mound. Due to the nature of the planned development work in this area in situ preservation of the remains was not possible and a full excavation was undertaken 4 July–19 August 2011. The entire area of the mound, 30 x 40m, was opened using a mechanical excavator. The steeply sloping N part of the site was devoid of archaeological features. The level plateau on the S of the mound contained the ephemeral remains of Structure A, of probable Neolithic or Early Bronze Age date, identified in the evaluation. A discontinuous circle (c4m diameter) of granodiorite boulders, interpreted as the inner wall face, was surrounded by a large arc of rubble (c14 x 12m); probably elements of masonry that had been displaced by later activity. The structure is very similar to those excavated at the Scord of Brouster on the W Mainland of Shetland. Although the structural elements of the building were poorly preserved, a series of charcoal and artefact rich occupation layers were excavated from the interior and immediate surroundings of Structure A. A large assemblage of worked quartz, pottery, worked felsite, and worked stone was recovered. A preliminary assessment of this assemblage strongly suggests a Neolithic date for the site, perhaps extending into the Early Bronze Age. Specialist post-excavation analysis and radiocarbon dating should help to establish a more refined chronology for the site. The analysis of the artefactual and charred plant assemblages will

	contribute significantly to our understanding of Shetland in the Neolithic. In addition to the prehistoric activity, the remains of a WW2 machine gun pit with associated areas of hard standing were recorded on the top of the mound. The remains of a N–S aligned field system relating to crofting were recorded over the S side of the valley, and a stone-lined drain of unknown date was also noted. Watching Brief (21 February 2014 - 9 May 2014); (HU 40755 75503 and HU 40610 75922) Watching brief on the machine excavation of a pipe sleeve trench and a pig reception pit at the Sullom Voe oil terminal, Delting Shetland. Nothing of archaeological significance was found.

Asset/Event Number	103
Asset/Event Name	Firth
Type of Asset/Event	Excavation
Date and/or Period	N/A
Listing No./NRHE Number	
HER Number	346585
Status	Event
Easting	443960
Northing	1173624
Parish	Delting
Council	Shetland Islands
Description	Excavation (8 November 2011 - 13 January 2012); HU 43960 73624 An evaluation was undertaken 8 November 2011 – 13 January 2012 of geophysical anomalies and landscape features in Firths Voe, prior to work associated with Total's Laggan-Tormore development. The survey area covered the S of the Voe, which is a steep N-facing hillside of rough grazing, with marshland in the valley bottom. A total of ten trenches were excavated across four geophysical anomalies and five earthworks/structures. The excavation of the largest anomoly (number 21) recorded a dry stone dyke, which may be prehistoric and a cultivated soil deposit. The wall and soil deposit, which had been disturbed by two later drains, were left in situ and covered with a geotextile membrane prior to backfilling. Additional trenches investigated a small enclosure or crub, a compacted earth platform and a two curbed platforms built of angular cobbles. All of the features probably dated to the early to mid-20th century. The excavation trench over Mound 105 was extended to the N to investigate the full extent of a series of stone-lined drains and ditch features. The feature represented a component of a wider drainage system across the hillside. Although their style of construction could be attributed to almost any date, their stratigraphy suggested they were post-medieval. A further three geophysical anomalies were shown to be natural/geological responses relating to the underlying drift geology (glacial till) and granodiorite bedrock.

Asset/Event Number	104
Asset/Event Name	Hill of Crooksetter
Type of Asset/Event	Watching Brief
Date and/or Period	N/A
Listing No./NRHE Number	
HER Number	359097
Status	Event
Easting	441350

Northing	1175840
Parish	Delting
Council	Shetland Islands
Description	Watching Brief (13 July 2017 - 31 August 2017); HU 41440 75845, HU 41395 75590, HU 41350 75840 and HU 41450 75615 A watching brief was undertaken, 13 July – 31 August 2017, during groundwork associated with excavation and construction work for a pipeline tie-in point and associated infrastructure. The excavations encountered 1.5–3.6m deep deposits of ombrotrophic peat bog overlying disorganised glacial till deposits, with evidence for post-glacial land surfaces with numerous inclusions of wood and waterlogged wood remains. These deposits probably represent willow-birch carr woodland, as recorded elsewhere in this area. The changes noted are potentially indicative of human activity, which led to the denudation of the tree cover, and contributed to the subsequent onset of raised peat bog development. The excavations recorded no finds or features of archaeological significance, though samples from the peat deposits may contain evidence of human impact on the palaeoenvironment.

Asset/Event Number	105
Asset/Event Name	East of Shetland Pipeline
Type of Asset/Event	Watching Brief
Date and/or Period	N/A
Listing No./NRHE Number	
HER Number	363042
Status	Event
Easting	441393
Northing	1175639
Parish	Delting
Council	Shetland Islands
Description	Watching Brief; HU 41393 75639 A watching brief was carried out, 10 July 2018, during the machine excavation of a 25 x 7m area of peat deposits in advance of the construction of an access road. No finds or features of archaeological significance were recorded.

Asset/Event Number	106
Asset/Event Name	Field Boundary
Type of Asset/Event	Field Boundary
Date and/or Period	Post Medieval
Listing No./NRHE Number	
HER Number	
Status	Non-Designated Heritage Asset
Easting	442148
Northing	1176887
Parish	Delting
Council	Shetland Islands
Description	Field boundary seen on 1881 OS map.

Asset/Event Number	107
Asset/Event Name	The Haa, Bardister, Ollaberry
Type of Asset/Event	
Date and/or Period	
Listing No./NRHE Number	LB44562
HER Number	
Status	Listed Building - Category B
Easting	435961
Northing	1177459
Parish	
Council	
Description	https://portal.historicenvironment.scot/designation/LB44562

Asset/Event Number	108
Asset/Event Name	BURN OF CROOKSETTER
Type of Asset/Event	Watching Brief
Date and/or Period	
Listing No./NRHE Number	
HER Number	378700
Status	Event
Easting	440563
Northing	1175672
Parish	
Council	
Description	https://canmore.org.uk/site/378700/

Asset/Event Number	109
Asset/Event Name	SHETLAND, HILL OF GARTH
Type of Asset/Event	
Date and/or Period	
Listing No./NRHE Number	
HER Number	378795
Status	Event
Easting	441540
Northing	1173933
Parish	

Council	
Description	https://canmore.org.uk/site/378795/

Asset/Event Number	110
Asset/Event Name	NANCY: BURRAVOE, MIO NESS, YELL SOUND, ATLANTIC
Type of Asset/Event	BRIG (18TH CENTURY)
Date and/or Period	
Listing No./NRHE Number	
HER Number	242187
Status	Non-Designated Heritage Asset
Easting	441000
Northing	1178000
Parish	
Council	
Description	https://canmore.org.uk/site/242187/

Asset/Event Number	111
Asset/Event Name	ALMA: YELL SOUND, ATLANTIC
Type of Asset/Event	LUGGER (19TH CENTURY)
Date and/or Period	
Listing No./NRHE Number	
HER Number	256269
Status	Non-Designated Heritage Asset
Easting	441000
Northing	1179000
Parish	
Council	
Description	https://canmore.org.uk/site/256269/

Asset/Event Number	112
Asset/Event Name	SHORT SUNDERLAND V FLYING BOAT: SULLOM VOE, ATLANTIC
Type of Asset/Event	AIRCRAFT (20TH CENTURY)
Date and/or Period	
Listing No./NRHE Number	
HER Number	290523
Status	Non-Designated Heritage Asset
Easting	441000

Northing	1179000
Parish	
Council	
Description	https://canmore.org.uk/site/290523/

Asset/Event Number	113
Asset/Event Name	SARO LONDON II FLYING BOAT: SULLOM VOE, ATLANTIC
Type of Asset/Event	AIRCRAFT (20TH CENTURY)
Date and/or Period	
Listing No./NRHE Number	
HER Number	290524
Status	Non-Designated Heritage Asset
Easting	441000
Northing	1179000
Parish	
Council	
Description	https://canmore.org.uk/site/290524/

Asset/Event Number	114
Asset/Event Name	UNKNOWN: BOOTH OF TOFT, TOFTS VOE, YELL SOUND
Type of Asset/Event	OBSTRUCTION (PERIOD UNASSIGNED)
Date and/or Period	
Listing No./NRHE Number	
HER Number	102933
Status	Non-Designated Heritage Asset
Easting	443788
Northing	1176051
Parish	
Council	
Description	https://canmore.org.uk/site/102933/

Asset/Event Number	115
Asset/Event Name	UNKNOWN: TOFT NESS, TOFTS VOE, YELL SOUND
Type of Asset/Event	OBSTRUCTION (PERIOD UNASSIGNED)
Date and/or Period	
Listing No./NRHE Number	
HER Number	102889

Status	Non-Designated Heritage Asset
Easting	443801
Northing	1176267
Parish	
Council	
Description	https://canmore.org.uk/site/102889/

Asset/Event Number	116
Asset/Event Name	Unknown: Booth Of Toft, Tofts Voe, Yell Sound
Type of Asset/Event	Craft
Date and/or Period	
Listing No./NRHE Number	
HER Number	102931
Status	Non-Designated Heritage Asset
Easting	443660
Northing	1176280
Parish	
Council	
Description	https://canmore.org.uk/site/102931/

Asset/Event Number	117
Asset/Event Name	Obstruction
Type of Asset/Event	Obstruction
Date and/or Period	
Listing No./NRHE Number	
HER Number	102932
Status	Non-Designated Heritage Asset
Easting	443831
Northing	1176236
Parish	
Council	
Description	https://canmore.org.uk/site/102932/

Asset/Event Number	118
Asset/Event Name	Ronas Hill, chambered cairn
Type of Asset/Event	
Date and/or Period	

Listing No./NRHE Number	SM2043
HER Number	
Status	Scheduled Monument
Easting	430558
Northing	1183432
Parish	Northmaven
Council	Shetland Islands
Description	Description The monument comprises a heel-shaped chambered cairn of the Neolithic period, built probably between 4000 and 2500 BC. It is visible as a mound of stones standing about 3.5m high and is situated at an altitude of 450m above sea level on the very summit of Ronas Hill, Shetland's highest point, with views far afield. The monument was first scheduled in 1955, but the documentation does not meet modern standards: the present rescheduling rectifies this. The near circular footprint of the cairn is reputed to have had an original diameter of 13.8m although its outer edge is now poorly defined. The mound is composed of large stones, some of which may have been placed on the cairn relatively recently. An entrance on the ESE side of the mound leads into a passage about 2.4m in length, which provides access to a rectangular chamber, measuring 1.7m by 0.9m. The roof of this chamber consists of a single capstone, 1.2m above floor level. The area to be scheduled is circular in shape, 30m in diameter, to include the remains described above and an area around them within which evidence relating to the monument's construction, use and abandonment may survive, as shown in red on the accompanying map. Statement of National Importance Cultural Significance The monument's cultural significance can be expressed as follows: Intrinsic characteristics The monument is in a stable condition and retains its form to a very significant degree, despite some evidence of removal of stone overburden to the west and re-deposition on top of the capstone and in front of the entrance way. Nothing is known of the original contents. The monument retains several interesting features, including the capstone, the internal construction details of the chamber, and an impressive lintel at the inner end of the entrance passageway. Chambered cairns are Neolithic in origin, dating most commonly from the third and fourth millennia BC and Ronas Hill represents a particularly well-preserved Shetland example. Excavation elsewhere suggests that they were used over a lengthy period and housed the remains of multiple individuals. Despite the removal and re-deposition of stone from this cairn, significant archaeological information is likely to survive beneath its surface. The excavation of similar mounds elsewhere in Scotland shows that cairns might be adapted over time and might also form a focus for burial in later periods. Buried deposits associated with cairns can help us to understand more about the practice and significance of burial and commemorating the dead at specific periods in prehistory. They may also help us to understand the changing structure of society in the area. In addition, the cairn is likely to overlie and seal a buried ground surface that could provide evidence of the immediate environment before the monument was constructed. Botanical remains including pollen or charred plant material may survive within archaeological deposits deriving from the cairn's construction and use. This evidence can help us build up a picture of climate, vegetation and agriculture in the area before and during construction and use of the cairn. Contextual characteristics

Heel-shaped cairns are a rare and distinctive form of chambered cairn found in the Shetland Islands. This example also has particular interest because of its location in a landscape rich in prehistoric monuments, including other cairns and settlement remains. There is a smaller cairn only 60m to the southwest and a platform 60m to the northwest. A further chambered cairn is situated on the opposite hillside across Ronas Voe, at a distance of some 4km to the southwest. Across Scotland, cairns are commonly positioned to be highly visible and are often inter-visible. The position and significance of this cairn in relation to contemporary agricultural land and settlement is likely to be significant and merits future detailed analysis. Given the many prehistoric sites in the area, this monument has the potential to further our understanding not just of funerary site location and practice, but also of the structure of early prehistoric society and economy.

National Importance

This monument is of national importance because it has an inherent potential to make a significant addition to our understanding of the past, particularly the design and construction of burial monuments, the nature of burial practices, and their significance in prehistoric and later society. Buried evidence from cairns can also enhance our knowledge about wider prehistoric society, how people lived, where they came from and who they had contact with. This monument is particularly valuable because it is well preserved and lies in a landscape where there is a variety of prehistoric monuments, including settlements. The loss of the monument would significantly diminish our future ability to appreciate and understand the placing of such monuments within the landscape and the meaning and importance of death and burial in prehistoric times.

Asset/Event Number	119
Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Horizontal Mill
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9792
Status	Non-Designated Heritage Asset
Easting	440808
Northing	1175875
Parish	Delting
Council	Shetland Islands
Description	Probable site for horizontal mill, evidenced by tumbled stone.

Asset/Event Number	120
Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Horizontal Mill
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9793
Status	Non-Designated Heritage Asset
Easting	440850

Northing	1175840
Parish	Delting
Council	Shetland Islands
Description	Rectangular area, 5m by 10m, of boulders alongside and projecting into a bend of the Burn of Crooksetter which may indicate the site of a former mill. 30m upstream, further stone setts can be seen revetting the edge of the burn. These may form part of the formalisation of the watercourse for this and other mill sites.

Asset/Event Number	121
Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Mill Pond; Horizontal Mill
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9794
Status	Non-Designated Heritage Asset
Easting	441157
Northing	1175754
Parish	Delting
Council	Shetland Islands
Description	Pair of possible mill pools within the Burn of Crooksetter. The first measures 6m by 4m with the burn inflowing from the east side and outflowing to the west. The second measures 7m by 6m and lies on the south bank, cut into the step -sided burn gully. The north and south edges are very straight with near square corners and may represent an enhanced, natural hollow within the run of the burn.

Asset/Event Number	122
Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Noost
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9799
Status	Non-Designated Heritage Asset
Easting	440646
Northing	1176954
Parish	Delting
Council	Shetland Islands
Description	Three boat noosts covering an area approximately 11m (N-S) by 6m (E-W).

Asset/Event Number	123

Asset/Event Name	Burn of Crooksetter
Type of Asset/Event	Clearance Cairn
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9800
Status	Non-Designated Heritage Asset
Easting	440656
Northing	1177033
Parish	Delting
Council	Shetland Islands
Description	Stone pile on coast edge approximately 5m (N-S) by 2m (E-W) and 0.5m in height. Possibly a clearance cairn.

Asset/Event Number	124
Asset/Event Name	Burn of Firth
Type of Asset/Event	Mound
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN8292
Status	Non-Designated Heritage Asset
Easting	443829
Northing	1173735
Parish	Delting
Council	Shetland Islands
Description	A large teardrop-shaped mound on the north side of the Burn of Firth. This could have started as a natural periglacial mound, but has clearly been enhanced and dug into by man. The whole mound is some 28m long E-W, 12m wide and 3m high. It resembles a prehistoric site.

Asset/Event Number	125
Asset/Event Name	Burn of Firth
Type of Asset/Event	Horizontal Mill
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN8283
Status	Non-Designated Heritage Asset
Easting	443735
Northing	1173698
Parish	Delting
Council	Shetland Islands

Description	The remains of two mills on the banks of the Burn of Firth. One mill on the northern bank is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv). The mill on the south side of the burn remains as rubble.

Asset/Event Number	126
Asset/Event Name	Crooksetter
Type of Asset/Event	Dyke; Faelly Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9797
Status	Non-Designated Heritage Asset
Easting	440635
Northing	1176640
Parish	Delting
Council	Shetland Islands
Description	A curving turf & stone dyke, 15m in length, round a boggy area. These are probably crofting remains and associated with Crooksetter. The remains lie on the very edge of the Shetland Gas Plant site area and may have been truncated or destroyed by this development.

Asset/Event Number	127
Asset/Event Name	Crooksetter
Type of Asset/Event	Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9798
Status	Non-Designated Heritage Asset
Easting	440675
Northing	1176838
Parish	Delting
Council	Shetland Islands
Description	Single width, large boulder dyke at least 15m in length, within the Crooksetter infield area. The dyke runs east -west (up/downslope) and is part of Crooksetter, though it could pre-date Crooksetter steading as it now exists.

Asset/Event Number	128
Asset/Event Name	Crooksetter Ridge
Type of Asset/Event	Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	

HER Number	MSN9812
Status	Non-Designated Heritage Asset
Easting	441245
Northing	1176390
Parish	Delting
Council	Shetland Islands
Description	Remains of pre-peat dyke across top of Crooksetter ridge.

Asset/Event Number	129
Asset/Event Name	Garth
Type of Asset/Event	Croft; Croft House
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN8869
Status	Non-Designated Heritage Asset
Easting	441060
Northing	1174570
Parish	Delting
Council	Shetland Islands
Description	(1) Norse and medieval site potentially exists below the cleared township of Garth. (2) Ruined building, mostly turf covered wall lines, beside burn to northeast of Garth pony pund. Also ruinous house, part of Garth township cleared in 1860s with galvanised iron/steel gate from 1860s clearance and creation of sheep farm still in evidence.

Asset/Event Number	130
Asset/Event Name	Garth
Type of Asset/Event	Farmstead; Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9802
Status	Non-Designated Heritage Asset
Easting	440562
Northing	1174635
Parish	Delting
Council	Shetland Islands
Description	Ruinous farmstead upslope from the current Garth House. Still visible as a series of earthworks.

Asset/Event Number	131
Asset/Event Name	Garth
Type of Asset/Event	Aircraft crash site
Date and/or Period	World War Two
Listing No./NRHE Number	
HER Number	MSN9803
Status	Non-Designated Heritage Asset
Easting	440897
Northing	1174620
Parish	Delting
Council	Shetland Islands
Description	Second World War crash site. Water-filled hole in peat, west side of yard at Garth pony pund remains.

Asset/Event Number	132
Asset/Event Name	Garth
Type of Asset/Event	Clearance Cairn; Cairn; Stone
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9804
Status	Non-Designated Heritage Asset
Easting	440977
Northing	1174430
Parish	Delting
Council	Shetland Islands
Description	A scatter of boulders, including some set on edge, on the west side of track. Site now lies under a large area of hard-standing.

Asset/Event Number	133
Asset/Event Name	Garth
Type of Asset/Event	Head Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9805
Status	Non-Designated Heritage Asset
Easting	441355
Northing	1174670
Parish	Delting
Council	Shetland Islands

Description	Extensive head dyke around the Garth township.

Asset/Event Number	134
Asset/Event Name	Garth
Type of Asset/Event	Clearance Cairn
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9806
Status	Non-Designated Heritage Asset
Easting	441064
Northing	1174436
Parish	Delting
Council	Shetland Islands
Description	Sequence of four large boulders with small stone heaped round them.

Asset/Event Number	135
Asset/Event Name	Garth
Type of Asset/Event	Burnt Mound; Mound
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9807
Status	Non-Designated Heritage Asset
Easting	441233
Northing	1174460
Parish	Delting
Council	Shetland Islands
Description	Turf covered penannular banks around a hollow. Possibly a prehistoric burnt mound, or post-medieval upcast.

Asset/Event Number	136
Asset/Event Name	Garth
Type of Asset/Event	Mound; Cairn; Clearance Cairn
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9808
Status	Non-Designated Heritage Asset
Easting	441232

Northing	1174519
Parish	Delting
Council	Shetland Islands
Description	Pair of turf-covered mounds one of which appears to consist of piled stones. A third pile is just north.

Asset/Event Number	137
Asset/Event Name	Garth
Type of Asset/Event	Sheep Shelter; Structure
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9809
Status	Non-Designated Heritage Asset
Easting	441273
Northing	1174563
Parish	Delting
Council	Shetland Islands
Description	Loose boulders which appear to have been arranged, perhaps to form a sheep shelter or building.

Asset/Event Number	138
Asset/Event Name	Garth
Type of Asset/Event	Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9810
Status	Non-Designated Heritage Asset
Easting	441269
Northing	1174440
Parish	Delting
Council	Shetland Islands
Description	Remains of a stone edge with a scatter of loose stones. Another stone edge/line of stones is just southeast of here orientated N-S.

Asset/Event Number	139
Asset/Event Name	Garth
Type of Asset/Event	Cultivation Terrace
Date and/or Period	Period Unassigned

Listing No./NRHE Number	
HER Number	MSN9811
Status	Non-Designated Heritage Asset
Easting	441153
Northing	1174330
Parish	Delting
Council	Shetland Islands
Description	A series of artificial terraces, may be associated with Garth House. A line of stones marks the western edge.

Asset/Event Number	140
Asset/Event Name	Garth Hill
Type of Asset/Event	Crash Site; Bomb Crater
Date and/or Period	World War Two
Listing No./NRHE Number	
HER Number	MSN6673
Status	Non-Designated Heritage Asset
Easting	440850
Northing	1174550
Parish	Delting
Council	Shetland Islands
Description	A few pieces of aluminium and a water-filled crater on Garth Hill mark the site where a Catalina (IVA JX210 Sqn Sullom Voe) crashed during an air-test on 25/03/44, killing all of the crew. The crew members were: F/L John Henry Dennis Keats (Pilot), Sgt William John Edward Hird (Co-Pilot), F/Sgt John Ralph Peberdy (F/E), Sgt Albert Clayton (W/Op), F/Sgt Francis Frederick Greig (Airframe Fitter/AG), F/Sgt James Robertson (WOP/AG) and Sgt John Bunting (Ground Crew).

Asset/Event Number	141
Asset/Event Name	Garths Voe
Type of Asset/Event	Aircraft
Date and/or Period	World War Two
Listing No./NRHE Number	
HER Number	MSN6129
Status	Non-Designated Heritage Asset
Easting	440629
Northing	1173725
Parish	Delting
Council	Shetland Islands
Description	(1) Annotation on OS map, 2nd edition, reads "Seaplane went on fire, sank with 2 x 250 bombs and 2 depth guages /

	charges (?), World War 2" (2) The entry above may relate to Entry 18 of the Air Crash Log which describes a Sunderland I that was destroyed by fire while at anchor in Sullom Voe on the 11/12/40. See also SMR 6131.

Asset/Event Number	142
Asset/Event Name	Hill of Garth
Type of Asset/Event	Mound
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9795
Status	Non-Designated Heritage Asset
Easting	441265
Northing	1175370
Parish	Delting
Council	Shetland Islands
Description	A large circular mound within an area of blanket peat moorland and eroded embankments formed from natural surface water channels. The mound measures approximately 22m by 20m and up to 2.5m in height. Possibly a natural feature of topography, but is quite pronounced with clearly defined extents.

Asset/Event Number	143
Asset/Event Name	Hill of Garth
Type of Asset/Event	Findspot
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN9983
Status	Non-Designated Heritage Asset
Easting	441270
Northing	1175070
Parish	Delting
Council	Shetland Islands
Description	The wooden drinking-cup (presented) was found resting on the surface of the gravel or drift, over which there was a depth of 4 feet 10 inches of peat. The position in which the cup was found was on the top of the hill of Garth. The hill is perfectly dry and vegetation in the peat has long since ceased. The diameter of the cup is 3 inches, the depth 1 1/2 inch, and the weight one ounce.

Asset/Event Number	144
Asset/Event Name	Laggan-Tormore

Type of Asset/Event	Oval House; Structure; In Situ Burnt Deposit; Dyke; Site; Findspot
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	MSN8845
Status	Non-Designated Heritage Asset
Easting	440726
Northing	1176192
Parish	Delting
Council	Shetland Islands
Description	An excavation was undertaken November 2010–January 2011 to investigate a group of features discovered during the monitoring of large-scale peat stripping just to the N of Sullom Voe Terminal. The peat stripping was part of ground preparation work associated with the construction of a gas processing plant. The excavation focused on a c5m N–S by 3.5m E–W area of charcoal-rich deposits, located in sub-peat layers, close to the remains of a substantial dyke of large granite boulders. The area is located c20m SW of a previously excavated series of Neolithic or Bronze Age structures (Site 002). The excavation recorded c1.5m of peat overlying two possibly colluvial layers, overlying a sealed series of layers derived from a major burning event. These deposits consisted of an upper brownish red horizon derived from oxidised fuel ash, which sealed a lower very dark greyish brown charcoal-rich horizon. The horizons were contemporary and related to the upper well oxidised portion of the fire, with the lower horizon formed under reducing conditions, which lead to the incomplete combustion of the fuel source. A significant assemblage of artefacts was recovered from the site, including pot, worked quartzite, worked stone (including felsite), pumice, burnt bone, and cramp (vitrified fuel ash slag). The most significant finds were two polished felsite axes. Initial analysis of the charred plant remains has revealed a very large assemblage of charcoal, and a significant quantity of barley. A full interpretation of the site awaits the completion of post-excavation analysis. However, initial hypotheses include the possibility that the feature may have been a cremation pyre, with the artefacts placed as pyre goods. However, an initial assessment of the burnt bone suggests it is animal rather than human. Alternatively, it may have been the site of a large, deliberately lit fire associated with food consumption or other activities. Equally, it could be the burnt remains of a structure, which could explain the comparatively large assemblage of artefacts. Whatever the origin of the fire the presence of cramp indicates that the fire reached a very high temperature. The stratigraphy of the burnt remains strongly suggests that they reflect a single burning event. The burnt feature was bounded to the E by a curvilinear stone enclosure dyke, which also appears to surround the Neolithic/Bronze Age house and funerary structures. The ephemeral remains of two curvilinear stone features, associated with the enclosure dyke, were also recorded during the excavations. These post-date the dyke, but all three features were probably broadly contemporary. It is possible that they represent the remains of double faced walls, which may have formed internal divisions within the enclosure.

Asset/Event Number	145
Asset/Event Name	Moorfield
Type of Asset/Event	Dyke
Date and/or Period	Period Unassigned
Listing No./NRHE Number	

HER Number	MSN5046
Status	Non-Designated Heritage Asset
Easting	442480
Northing	1172711
Parish	Delting
Council	Shetland Islands
Description	(1) The remains of a stone dyke which exists as a row of upright stones running in a straight line for approximately 30m. The dyke probably belongs to the crofting period. (2) Visited by AOC Archaeology 03/10/07 (3) The wall is depicted on the 1st edition of the OS 6-inch map (Orkney & Shetland (Shetland) 1881, sheet xxv) as part of an enclosure associated with a school

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Asset/Event Number	146
Asset/Event Name	Orka Voe
Type of Asset/Event	Enclosure; Building
Date and/or Period	Period Unassigned
Listing No./NRHE Number	
HER Number	
Status	Non-Designated Heritage Asset
Easting	440685
Northing	1177120
Parish	Delting
Council	Shetland Islands
Description	Ruined stone enclosure/building at old shore edge, with heap of rubble, possible clearance cairn nearby. Inaccessible within SVT perimeter fence. Probably crofting remains associated with Crooksetter.

Asset/Event Number	147
Asset/Event Name	Toft
Type of Asset/Event	Burnt Mound; Fence
Date and/or Period	Bronze Age
Listing No./NRHE Number	
HER Number	MSN5043
Status	Non-Designated Heritage Asset
Easting	443531
Northing	1176453
Parish	Delting
Council	Shetland Islands
Description	A large mound which lies on sloping ground. It is built up on the SW side to compensate for this. The NE side has a lower gradient and merges with the natural slope of the hillside. The

	mound is slightly crescent-shaped. Sheep scrapes in the SW side reveal fragments of burnt stone and this feature is likely to be a burnt mound. The present fence line runs across the SW side of the mound.

Asset/Event Number	148
Asset/Event Name	Toog
Type of Asset/Event	Dyke
Date and/or Period	Prehistoric
Listing No./NRHE Number	
HER Number	MSN5044
Status	Non-Designated Heritage Asset
Easting	443675
Northing	1177115
Parish	Delting
Council	Shetland Islands
Description	The remains of a dyke running roughly N-S which appears to be prehistoric in date. It consists of a number of large upright stones before turning into a bank further to the south.

APPENDIX C1
NATURAL HERITAGE DESK STUDY

Neshion Energy Park Natural Heritage Information Desk Study

Alba Ecology Ltd.

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February 2023

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Introduction

Neshion Ltd. is planning to develop an energy park to the east of Sullom Voe, with the proposed Application Boundary centred on Crooksetter Hill, Mainland, Shetland (Figure 1).

As part of the planning process, Alba Ecology Ltd. was commissioned to conduct a natural heritage desk study to identify biological records within approximately 2km radius of the Application Boundary and to identify statutory conservation designated sites within a 10km radius of the Application Boundary.

The centre of the Application Boundary is situated at approximately OS grid reference HU 42 76. Figure 1 provides a map of the Application Boundary plus a 2km buffer hereafter named the Search Area.

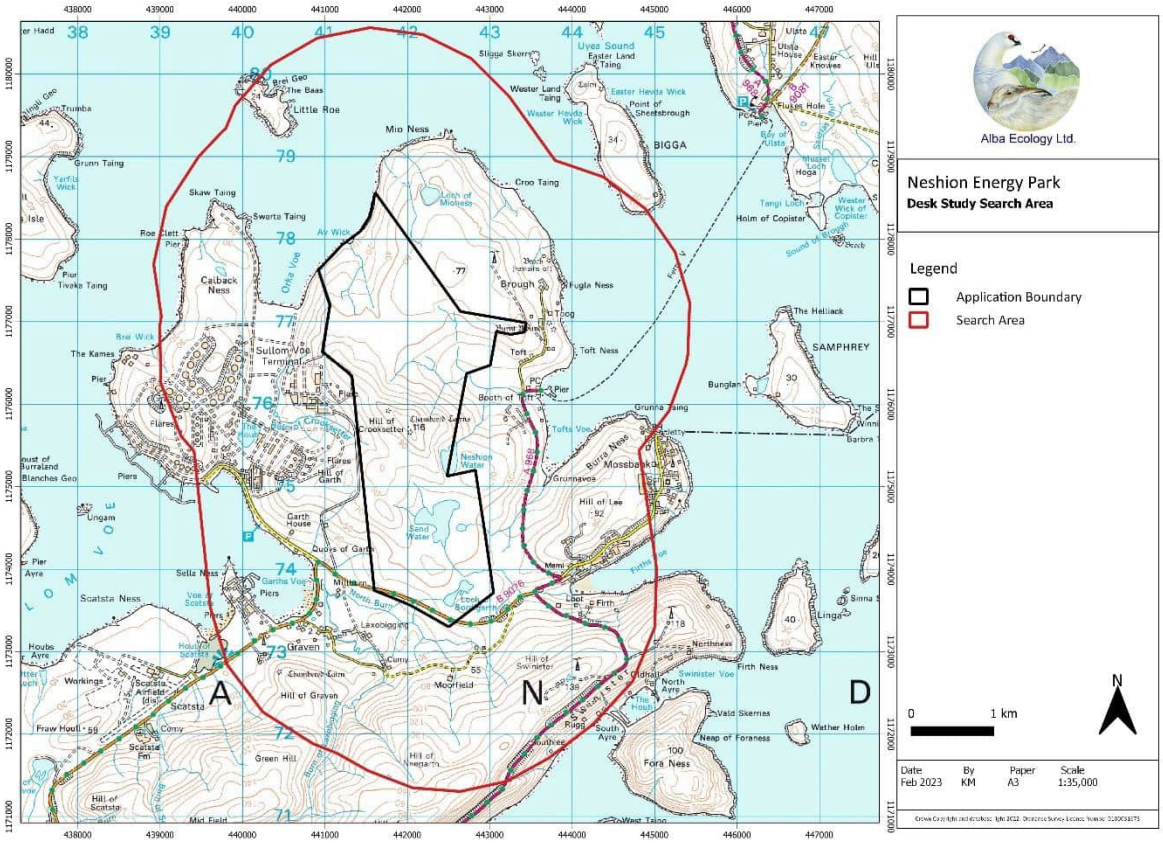

Figure 1: The Search Area.

The Application Boundary is characterised by blanket bog habitat. Details of the habitats within the Application Boundary can be found in the Neshion Energy Park Habitat Survey Report completed in 2023 by Alba Ecology.

A desk study of biological records was conducted in 2022-2023. Shetland Biological Records Centre (SBRC) was contacted, and data was obtained from the NatureScot SiteLink website and the National Biodiversity Network (NBN) Atlas.

This desk study aims to identify records of species and habitats with conservation importance within the Search Area and statutory designated sites within 10km of the Application Boundary.

Study methods

The data searches for this desk study follows Chartered Institute of Ecology and Environmental Management (CIEEM) best practice guidelines (e.g. CIEEM, 2020; CIEEM, 2017). The background data aims to provide the following information:

- Designated site information;
- Existing records of protected/priority/notable species for the site;
- Existing records of protected/priority/notable species for the surrounding area;
- Habitat information where available; and
- Soil and geological information for the site.

Designated site information

Sites with statutory conservation designations located within a 10km of the Application Boundary were identified using the NatureScot SiteLink website (accessed February 2023). These included Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites. In additional, Local Nature Conservation Site (LNCS) were also considered within the Search Area using details from Shetland Island Council (SIC, 2015).

Existing species records for the Search Area

SBRC

Species records were requested from the local biological records centre, as per best practice guidelines (CIEEM, 2020). SBRC was contacted in February 2023 to search for all biological records within the Search Area. Provision of the data by the SBRC recorders is neutral and should not be regarded, either explicitly or implicitly, as approving or opposing any project informed by the data. Seabird data was requested from Shetland Oil Terminal Environmental Advisory Group (SOTEAG).

NBN Atlas

All biological records within the Search Area were searched for on the NBN Atlas paying due regard to the restrictions on the NBN Atlas as per CIEEM guidance (2020).

All records for the Search Area were downloaded on the NBN Atlas website in February 2023. As per NBN Atlas guidance for commercial use, only the records which have an Open Data licence (coded CCO, CC-BY and OGL) have been considered and presented here. These data "*can be used for any purpose*" (NBN Atlas, 2023). Those data with a non-commercial licence

(CC-BY-NC) were not included and were not inspected or considered. This is accordance with the NBN Atlas terms and conditions for commercial use (NBN Atlas, 2023).

It should be noted that the Data Provider, Original Recorder [where identified], and the NBN Trust bear no responsibility for any further analysis or interpretation of that material, data and/or information.

Provision of the data by the NBN recorders is neutral and should not be regarded, either explicitly or implicitly, as approving or opposing any project informed by the data.

As with all desk studies, the data collected are only as good as the data supplied to the recording schemes. The recording schemes and recorders provide disclaimers in relation to the quality and quantity of the data they provide, and these should be considered when examining the outputs of this desk study. No attempt has been made to verify these records. Common (vernacular) names are used where they have been provided by the recorder.

Scottish Biodiversity List

The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, under the Nature Conservation (Scotland) Act 2004. Therefore, all species records, for all sources, were compared against the Scottish Biodiversity List (SBL).

Existing habitat records for the Search Area and surrounding area

Relevant sources, such as the Ancient Woodland Inventory (AWI) and NatureScot's open data for habitats (e.g. National Vegetation Classification (NVC) shapefiles) were examined to consider habitats that could be present within the Search Area.

Soil and Geology for the Site

Soil and geological information can provide insight into the vegetation expected on a site (Botanæco, 2021). Therefore, the British Geological Society's (BGS) hydrogeological and geological mapping and the Scotland's Soils (2016) Carbon and Peatlands Map have been consulted.

Results

Designated site information

A total of 11 statutory designated sites with biological features, within a 10km radius of the Application Boundary, have been identified (Table 1; Figure 2). These included two SPAs, three SACs, five SSSIs and a single Ramsar site. There was overlap between these designated sites (e.g. Ronas Hill (or parts of it) is a SPA, SAC, SSSI and Ramsar Site) and Yell Sound Coast included multiple sections of coastland. The closest designated sites to the Application Boundary are Yell Sound Coast SAC and SSSI and Sullom Voe SAC. A section of Yell Sound Coast is adjacent and slightly within the Application Boundary at the north end (Figure 2). It is designated for harbour seals and otters (Table 1). Sullom Voe SAC is designated for marine habitats and is adjacent to the Application Boundary on the northern end (Table 1; Figure 2).

Name	Designation	Size (ha)	Distance (km) and direction from the Application Boundary	Feature of Interest
Yell Sound Coast	SAC	1,544.4ha	0.0km, north	Harbour seal; and Otters.
Sullom Voe	SAC	2,691.4ha	0.0km, north and west	Lagoons; Reefs; and Shallow inlets and bays.
Ronas Hills – North Row	SAC	4,903.5ha	8.5km, northwest	Acid peat-stained lakes and ponds; Acidic scree; Alpine and subalpine heaths; Blanket bog; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; Dry heath; and Wet heathland with cross-leaved heath.
Ronas Hill - North Roe and Tingon	SPA	5,474.3ha	8.5km, northwest	Breeding great skua; and Breeding red-throated diver.
Ronas Hill - North Roe and Tingon	Ramsar	5,474.3ha	8.5km, northwest	Blanket bog.
Otterswick and Graveland	SPA	2,239.6ha	6.8km, northeast	Breeding red-throated diver.
Ronas Hills – North Row	SSSI	4,900.9ha	8.5km, northwest	Artic water flea; Blanket bog; Breeding bird assemblages; Montane assemblages; Scrub; and Breeding red-throated divers.
Burn of Valayre	SSSI	5.5ha	6.4km, southwest	Scrub.
Dales Voe	SSSI	5.6ha	4.7km, south	Saltmarsh.
Yell Sound Coast	SSSI	868.8ha	0.0km, north	Otter.
Otterswick	SSSI	1,388.3ha	6.8km, northeast	Breeding red-throated diver.

Table 1: Statutory designated sites within 10km of the Application Boundary.

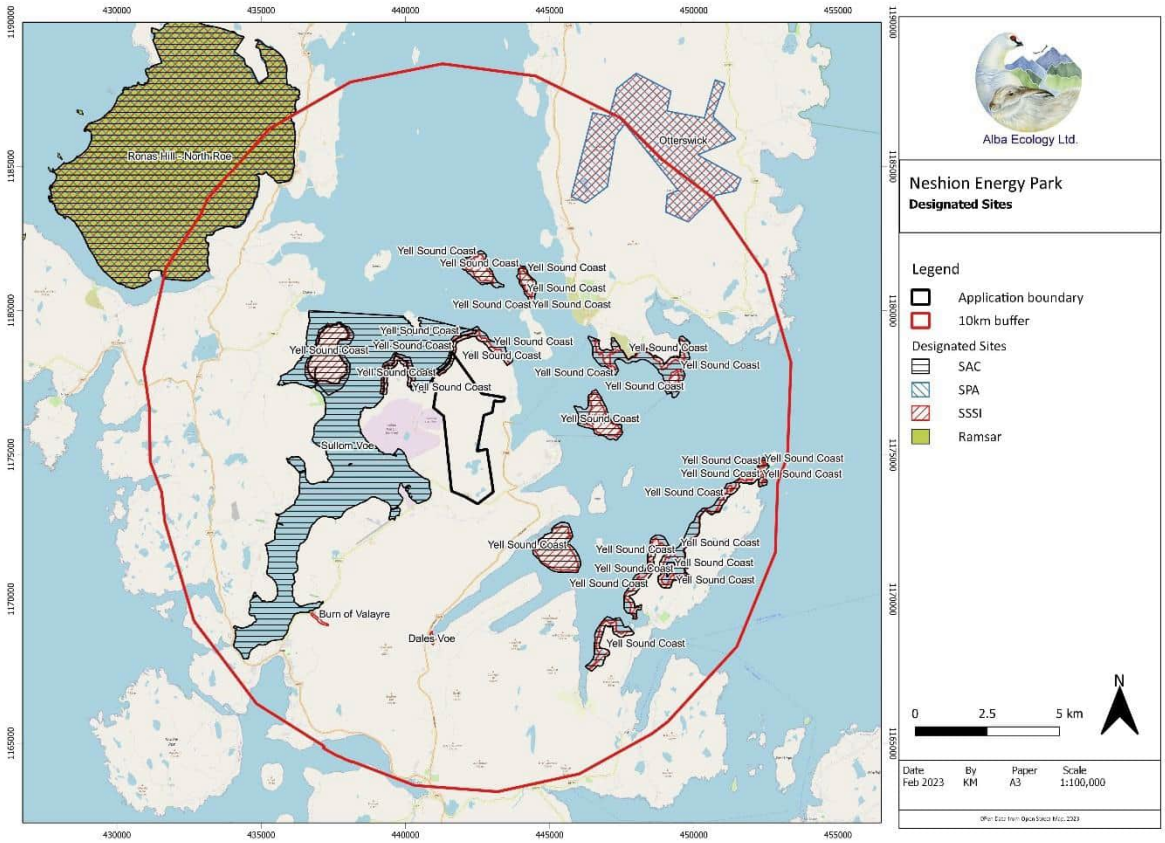

Figure 2: Statutory designated sites within 10km of the Application Boundary.

Local Nature Conservation Sites (LNCS)

There is a single LNCS within the Search Area, Bordigarth LNCS, which is primarily designated for breeding Schedule 1 bird species (SIC, 2015). The boundary of the LNCS, according to the Shetlands Local Development Plan Supplementary Guidance (SIC, 2015) is in the south of the Search Area, but the boundary supplied by SBRC is larger and extends over much of the Application Boundary (Figure 3). SBRC also stated active blanket bog as a feature of Bordigarth LNCS.

According to Shetlands Local Development Plan Supplementary Guidance (SIC, 2015) "*The purpose of LNCS is to highlight sites with important natural heritage to developers and the Council. In identifying LNCS the Council does not seek to prohibit development; they provide more information to ensure that development takes into account the important and sensitive features of these sites. However, there may be occasions where development would be considered inappropriate and would not be permitted*."

We cannot find a published explanation for the apparent discrepancy between the description and boundary of the Bordigarth LNCS provided by SIC and NatureScot and that provided by SBRC, although SBRC state "*the original boundaries were provisional, and when we undertook a review of them for the council a few years ago, some of them were increased or reduced to*

reflect the key site interests" (SBRC, *pers comm*.). It is recommended that clarification on this is sought from the planning authority, SIC in this instance (and potentially a planning lawyer).

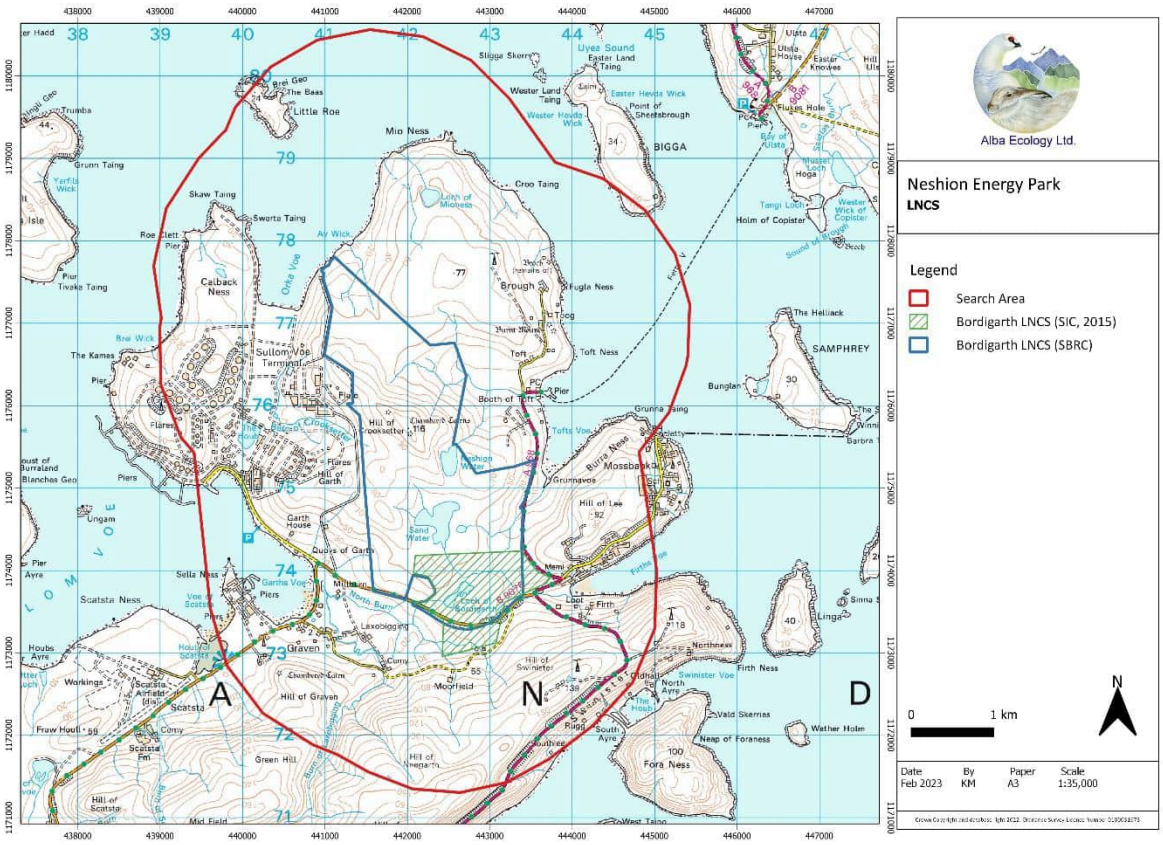

Figure 3: LNCS within the Search Area: note apparent discrepancy in boundary.

Existing species records for the Search Area

SBRG data

The SBRG search (conducted on 17/02/2023) for all biological records for the Search Area provided a total of 2,550 records of 421 species. The full list of species is provided in Appendix 1.

Several species recorded were noted as scarce or rare in Shetland. These are presented in Table 2. It should be noted that some of these species are non-native in Shetland such as hedgehog and mountain hare.

Species name	Common name	Status/Listing
Lepidozia cupressina	*Rock fingerwort*	*Scarce (Shetland)*
Nowellia curvifolia	*Wood-rust*	*Scarce (Shetland)*
Spergularia marina	*Lesser sea-spurrey*	*Scarce (Shetland)*
Atriplex prostrata agg.	*Atriplex prostrata agg.*	*Rare (Shetland)*
Veronica beccabunga	*Brooklime*	*Scarce (Shetland)*
Eleocharis uniglumis	*Slender spike-rush*	*Scarce (Shetland)*
Carex curta	*White sedge*	*Scarce (Shetland)*
Schistidium strictum	*Upright brown grimmia*	*Rare (Shetland)*
Barbula convoluta var. convoluta	*Lesser bird's-claw beard-moss*	*Rare (Shetland)*
Mnium hornum	*Swan's-neck thyme-moss*	*Scarce (Shetland)*
Diphasiastrum alpinum	*Alpine clubmoss*	*Scarce (Shetland)*
Chamerion angustifolium	*Rosebay willowherb*	*Rare (Shetland)*
Ruppia cirrhosa	*Spiral tasselweed*	*SBL*
Cochlearia officinalis subsp. scotica	*Scottish scurvygrass*	*SBL*
Cercyon (Cercyon) quisquilius	*Cercyon (Cercyon) quisquilius*	*SBL*
Timandra comae	*Blood-Vein*	*SBL*
Dasypolia templi	*Brindled ochre*	*SBL*
Apamea remissa	*Dusky brocade*	*SBL*
Celaena haworthii	*Haworth's minor*	*SBL*
Celaena leucostigma	*Crescent*	*SBL*
Erinaceus europaeus	*Hedgehog*	*SBL*
Pipistrellus nathusii	*Nathusius's pipistrelle*	*SBL*
Lepus timidus	*Mountain hare*	*SBL*

Table 2: Non-avian species listed in the SBRG dataset from the Search Area which are on the Scottish Biodiversity List (SBL) or noted as scarce or rare by SBRG.

SOTEAG data

The data from SOTEAG is being sought and will be provided in a separate, Confidential Appendix.

NBN Atlas data

The NBN Atlas provided a total of 6,345 occurrences of 1,362 species from a variety of taxa (NBN Atlas occurrence download, 2023). Using only the data with an Open Data licence (coded CCO, CC-BY and OGL) the total number of occurrences was reduced to 3,586 with a total of 1,041 species. Table 3 provides a summary of data by taxonomic groups. Only the data with an Open Data licence were considered in this report.

Kingdom	Phylum/Class/Order	Note	No. of species recorded
Animals	Annelida	Worms	195
	Arthropoda	Insects, spiders, crustaceans	149
	Bryozoa	Aquatic invertebrates	44
	Actinopterygii	Bony fish	9
	Ascidiacea	Sea squirt	4
	Aves	Birds	64
	Mammalia	Mammals	5
	Cnidaria	Aquatic invertebrate	20
	Crustacea	Aquatic arthropods	1
	Echinodermata	Marine invertebrates	29
	Mollusca	Mollusc	97
	Nematoda, Nemertea, Platyhelminthes, Porifera, Sipuncula, Priapulida	Ribbon worms, simple invertebrates, nematodes etc.	15
Chromista		single-celled and multicellular eukaryotic	23
Fungi		Fungi	150
Plantae	Bryophyta	Mosses	88
	Chlorophyta	Green algae	7
	Marchantiophyta	Liverworts	34
	Pteridophyta	Ferns etc.	1
	Rhodophyta	Algae	33
	Tracheophyta	Vascular plants	72
		Unknown	1
Total			1041

Table 3: Summary of biological records provided by the NBN Atlas, search conducted February 2023 (NBN Atlas occurrence download at https://nbnatlas.org accessed on Tue Feb 07 10:47:54 UTC 2023).

The full list of species and the data providers are provided in the accompanying Appendix 1: Desk Study NBN Data Sheet. A total of 25 of the listed species were on the SBL. Otter are also listed as European Protected Species. The non-avian species which were on the SBL are listed in Table 4.

Species name	Common name	Taxa	Listing
Anguilla anguilla	European eel	Fish	SBL
Lutra lutra	Otter	Mammal	SBL, EPS
Lepus timidus	Mountain hare	Mammal	SBL
Pannaria rubiginosa	A fungi	Fungi	SBL
Salmo trutta	Brown/sea trout	Fish	SBL
Salmo salar	Atlantic salmon	Fish	SBL
Cylindroporella tubulosa	A bryozoan	Bryozoa	SBL
Phoca vitulina	Common seal	Mammal	SBL

Table 4: Non-avian species listed in the NBN Atlas dataset from the Search Area which are European Protected Species or on the Scottish Biodiversity List (SBL).

Existing habitat records for the Search Area

There were no records of ancient woodland within the Search Area. The open access NatureScot shapefiles for the National Vegetation Classification (NVC) did not hold any records within the Search Area. The open access NatureScot shapefiles for the Phase 1 Habitats included a very small section of the Search Area at the 2km boundary. The habitats recorded were acid grassland and dry heath.

Sullom Voe SAC is adjacent to the Application Boundary as is designated for marine habitats. These are described in the Conservation Management Advice as:

"Sullom Voe protects a very diverse assemblage of marine habitats and many of the associated species-rich communities are poorly represented elsewhere in Europe. The complex voe system has a highly irregular coastline and contains reefs including horse mussels beds that provide habitats for other marine species such as brittle stars and sea squirts. The Sullom Voe SAC gives protection to an extensive and diverse system of saline lagoons, supporting a range of diverse communities. Muddy sediments present at a variety of depths in Sullom Voe support slightly different yet abundant communities, consisting predominantly of polychaetes, bivalves and amphipods" (NatureScot, 2021).

The Yell Sound Coast SSSI Citation describes the habitat within the designated as:

"Yell Sound Coast SSSI consists of low rocky coastlines backed by areas of peaty moorland with numerous sources of fresh water. This habitat provides suitable conditions for otters and sustains a nationally and internationally important breeding population. It is estimated that the site supports at least a fifth of Shetland's population and 2.5 % of the British population" (NatureScot, no date).

Soil and Geology for the Search Area

The predicted Carbon and Peatland Map (2016) for the Search Area is shown in Figure 4. It predicts that much of the Search Area is Class 1 peatlands, with other areas mostly predicted

to be Class 4 or Class 5. Class 1 peatland is defined as "*nationally important carbon-rich soils, deep peat and priority peatland habitat and areas likely to be of high conservation value*". Class 4 is defined as "*area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils*". Class 5 is defined as "*soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat*." It should be noted that the Carbon and Peatland Map is a high-level predictive planning tool which provides an indication of the likely presence of peat on each individually mapped area, at a coarse scale. The map is not a definitive account of where important carbon rich soils, deep peat and priority peatland habitat exist.

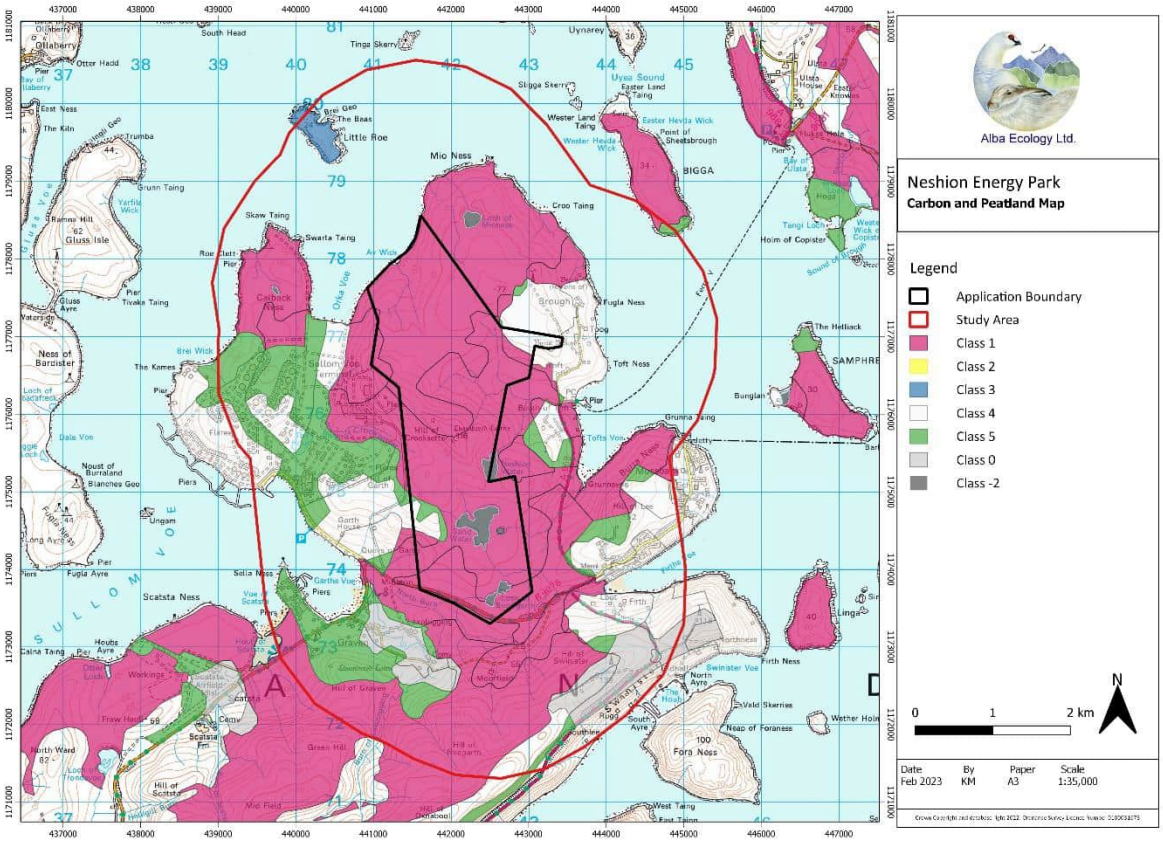

Figure 4: Extract of the predicted Carbon and Peatland Map for the Search Area (Scotland's Soil, 2016).

Table 5 provides an overview of the geological information recorded for the Search Area.

Source	Details
Carbon and Peatland map	Predicted mixture of: • Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value. • Class 3 - Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat. • Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils. • Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.

Source	Details
	• Class 0 - Mineral soil - Peatland habitats are not typically found on such soils. • Class -2 - Non-soil (e.g. loch, built up area, rock and scree).
BGS – superficial deposits	The majority of the superficial deposits in the Search Area were described as: • Peat. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period. • Glacial Deposits - diamicton. Sedimentary superficial deposit formed between 2.588 million and 11.8 thousand years ago during the Quaternary period. • Marine Beach Deposits - gravel, sand and silt. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period.
BGS – bedrock	The bedrock found in the Search Area are described as: North and west of the Search Area: • Yell Sound Psammite Formation - psammite and pelite. Metamorphic bedrock formed between 1000 and 541 million years ago between the Tonian and Ediacaran periods. West of Search Area: • Yell Sound Psammite Formation - psammite, gneissose. Metamorphic bedrock formed between 1000 and 541 million years ago between the Tonian and Ediacaran periods. South of Search Area: • Graven Complex - granodiorite. Igneous bedrock formed between 419.2 and 393.3 million years ago during the Devonian period.
BGS - hydrogeological maps	Low productivity aquifer with small amounts of groundwater in near surface weathered zone and secondary fractures.

Table 5: Summary descriptions of the soils, bedrock, and hydrogeology for the Search Area (BGS, 2023a; BGS, 2023b; Scotland's Soils, 2016).

Discussion

This desk study has identified several potentially important ecological sensitivities within the Search Area, as far as existing and freely available data allows. Desk-based studies of this nature have limitations, such as the reliability of third-party records, the coverage of reported studies and the age of data (former occurrence does not necessarily equate present occurrence).

A total of 11 statutory designated sites with biological features were recorded. The closest designated sites to the Application Boundary are Yell Sound Coast SAC and SSSI and Sullom Voe SAC. Additionally, Bordigarth LNCS is located in the Application Boundary, although the extent of this site is unclear and further expert advice is recommended.

There was a relatively high number of records for the Search Area for both the NBN data search and the SBRG data.

The SBRG search recorded some species as scarce or rare in Shetland. It should be noted that some of these species are very common in mainland Scotland, such as rosebay willowherb. A small number of the species records from the SBRG search are on the SBL although some of these species are non-native in Shetland such as hedgehog and mountain hare. The former having caused ecological problems elsewhere when they have been introduced e.g. Western Isles.

All terrestrial mammal species in Shetland are non-native having been introduced by humans over time (Johnston, 1999). Neither NatureScot nor CIEEM provide guidance on determining the value of non-native species (with the exception of otter, which is a European Protected Species), so professional judgement and general guidance from the Invasive Non-native Species Framework Strategy for Great Britain has been used (DEFRA *et al.,* 2015). This suggests that non-native species should not be considered as valuable or important ecological receptors. This approach was also used and accepted at the Viking Wind Farm, Beaw Field Wind Farm, Mossy Hill Wind Farm and the Shetland (SaxaVord) Space Centre planning determinations.

The data from the NBN data search had particularly numerous records for some taxonomic groups e.g. there was 195 species of Annelida (worms), 150 species of fungi and many aquatic and marine invertebrates recorded in the Search Area. This indicates a good base level of knowledge for these groups. However, there was a relatively paucity of biological records available for other taxonomic groups, such as some invertebrate groups e.g. spiders, indicating either that there was a low level of biodiversity within the Search Area and/or a low level of biological recording for some taxonomic groups. It is worth noting that the historic data supplied by data providers is just that, historic.

Otter is a notable species within the Search Area and is listed as a European Protected Species and features in adjacent designated sites. The Yell Sound Coast SSSI Citation notes that this

designated site supports at least a fifth of Shetland's otter population and 2.5% of the British otter population. The Yell Sound Coast SAC management statement states:

"*The otter Lutra lutra population in Shetland is one of the most intensively-studied in Europe. Not only are the Shetland animals morphologically distinct from their mainland counterparts, they are also believed to be genetically distinct. In addition, specialists consider that the populations are possibly the densest in Europe. Therefore, the Shetland population is in many ways unique, and is considered of special importance in a UK context. Within Shetland, the Yell Sound area has the highest density of otter. Indeed the site is believed to support more than 2% of the entire GB otter population. The site consists of a complex of islands and coastline, selected to include the areas of highest otter density. The areas are characterised by low-lying peaty coastlines with large numbers of otter holts and easy access to fresh water. The adjacent marine areas have extensive algal beds which are used for foraging*" (NatureScot, 2021).

There were a limited number of publicly accessible records of the habitats in and around the Search Area, with most information relating to the marine environment.

It is important to understand that a lack of information for a species (or indeed Class/Order) does not necessarily mean absence, and previous historical occurrence does not necessarily mean current presence.

References

British Geology Survey (BGS). 2023a. Geology of Britain Viewer. http://mapapps.bgs.ac.uk/geologyofbritain/home.html. Site accessed February 2023.

BGS. 2023b. *GeoIndex Onshore*. http://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap. Accessed February 2023.

Botanæco. 2021. *GWDTE Go with the flow*. www.botanaeco.co.uk/blog.

Chartered Institute of Ecology and Environmental Management (CIEEM). 2020. *UK Guidelines for Accessing and Using Biodiversity Data.* CIEEM.

Chartered Institute of Ecology and Environmental Management (CIEEM). 2018. *Guidelines for ecological impact Assessment in the United Kingdom and Ireland*. Version 1.1. Updated September 2019.

CIEEM. 2017. *Guidelines for Preliminary Ecological Appraisal,* 2nd edition. CIEEM.

DEFRA, The Scottish Government and The Welsh Government. 2015. The Great Britain Invasive Non-native Species Strategy.

Johnston, J.L. 1999. A Naturalists' Shetland. T and A.D. Poyser.

NatureScot, 2021. *Sullom Voe Conservation Management Advice*. SiteLink (nature.scot).

NatureScot. No date. Citation - Yell Sound Coast Site of Special Scientific Interest Shetland Islands. SiteLink (nature.scot).

NatureScot Site Link. 2023. SiteLink (nature.scot)

National Biodiversity Network (NBN) Atlas, 2023. https://nbnatlas.org/.

NBN Atlas occurrence download at https://nbnatlas.org accessed on Tue Feb 07 10:47:54 UTC 2023.

Scotland's Soils. 2016. *Carbon and Peatland Maps*. https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/.

Shetland Island Council (SIC). 2015. Shetlands Local Development Plan Supplementary Guidance. local-nature-conservation-site-supplementary-guidance (shetland.gov.uk).

Appendix 1: Desk Study SBRG Data Sheet

Scientific name	Common name	Status (if applicable)
Pogonatum aloides	Aloe Haircap	
Diphasiastrum alpinum	Alpine Clubmoss	Scarce (Shetland)
Polytrichum alpinum	Alpine Haircap	
Buellia punctata	Amandinea punctata	
Phlogophora meticulosa	Angle Shades	
Orthotrichum anomalum	Anomalous Bristle-moss	
Mylia anomala	Anomalous Flapwort	
Cerapteryx graminis	Antler Moth	
Aphrosylus ferox	Aphrosylus ferox	
Stercorarius parasiticus	Arctic Skua	
Sterna paradisaea	Arctic Tern	
Arrhenia rickenii	Arrhenia rickenii	
Aspicilia grisea	Aspicilia grisea	
Aspicilia leprosescens	Aspicilia leprosescens	
Lagenorhynchus acutus	Atlantic White-sided Dolphin	
Atriplex prostrata agg.	Atriplex prostrata agg.	Rare (Shetland)
Gentianella amarella subsp. septentrionalis	Autumn Gentian	
Paradiarsia glareosa subsp. glareosa	Autumnal Rustic	
Cetorhinus maximus	Basking Shark	
Chiroptera	Bats	
Autographa pulchrina	Beautiful Golden Y	
Belonia nidarosiensis	Belonia nidarosiensis	
Lophocolea bidentata	Bifid Crestwort	
Cepphus grylle	Black Guillemot	
Tephromela atra	Black Shields	
Turdus merula	Blackbird	
Larus ridibundus	Black-headed Gull	
Montia fontana	Blinks	
Timandra comae	Blood-Vein	
Timandra griseata	Blood-Vein	
Sphagnum palustre	Blunt-leaved Bog-moss	
Narthecium ossifragum	Bog Asphodel	
Riccardia latifrons	Bog Germanderwort	
Aulacomnium palustre	Bog Groove-moss	
Potamogeton polygonifolius	Bog Pondweed	
Odontoschisma sphagni	Bog-moss Flapwort	
Bolyphantes luteolus	Bolyphantes luteolus	
Agrochola circellaris	Brick	
Dasypolia templi	Brindled Ochre	
Polytrichum piliferum	Bristly Haircap	
Veronica beccabunga	Brooklime	Scarce (Shetland)
Dicranum scoparium	Broom Fork-moss	
Rattus norvegicus	Brown Rat	
Bryum bicolor	Bryum bicolor	
Plantago coronopus	Buck's-horn Plantain	
Buellia aethalea	Buellia aethalea	
Juncus bulbosus	Bulbous Rush	
Callicorixa wollastoni	Callicorixa wollastoni	
Calliphora uralensis	Calliphora uralensis	
Caloplaca crenularia	Caloplaca crenularia	
Caloplaca holocarpa	Caloplaca holocarpa	
Caloplaca saxicola	Caloplaca saxicola	
Campylium stellatum var. stellatum	Campylium stellatum var. stellatum	
Candelariella vitellina	Candelariella vitellina	
Bryum capillare	Capillary Thread-moss	
Catillaria chalybeia	Catillaria chalybeia	
Cercyon (Cercyon) quisquilius	Cercyon (Cercyon) quisquilius	
Cetema elongatum	Cetema elongatum	
Myosotis discolor	Changing Forget-me-not	
Eulithis testata	Chevron	
Chiloscyphus polyanthos var. polyanthos	Chiloscyphus polyanthos var. polyanthos	

Cladonia bellidiflora	Cladonia bellidiflora	
Cladonia furcata	Cladonia furcata	
Cladonia merochlorophaea	Cladonia merochlorophaea	
Galium aparine	Cleavers	
Apamea crenata	Clouded-bordered Brindle	
Mycena swartzii	Collared Mosscap	
Tussilago farfara	Colt's-foot	
Lotus corniculatus	Common Bird's-foot-trefoil	
Enallagma cyathigerum	Common Blue Damselfly	
Stellaria media	Common Chickweed	
Funaria hygrometrica	Common Cord-moss	
Eriophorum angustifolium	Common Cottongrass	
Delphinus delphis	Common Dolphin	
Eurhynchium praelongum	Common Feather-moss	
Rana temporaria	Common Frog	
Scoparia ambigualis	Common Grey	
Larus canus	Common Gull	
Polytrichum commune	Common Haircap	
Blasia pusilla	Common Kettlewort	
Galium palustre subsp. palustre	Common Marsh-bedstraw	
Cerastium fontanum	Common Mouse-ear	
Xanthoria parietina	Common Orange Lichen	
Barbilophozia floerkei	Common Pawwort	
Phocoena phocoena	Common Porpoise	
Porcellio scaber	Common Rough Woodlouse	
Puccinellia maritima	Common Saltmarsh-grass	
Actitis hypoleucos	Common Sandpiper	
Cochlearia officinalis	Common Scurvygrass	
Phoca vitulina	Common Seal	
Atrichum undulatum	Common Smoothcap	
Eleocharis palustris	Common Spike-rush	
Thuidium tamariscinum	Common Tamarisk-moss	
Sterna hirundo	Common Tern	
Campylopus brevipilus	Compact Swan-neck Moss	
Apamea furva subsp. britannica	Confused	
Phalacrocorax carbo	Cormorant	
Crex crex	Corncrake	
Agrostis stolonifera	Creeping Bent	
Ranunculus repens	Creeping Buttercup	
Jungermannia gracillima	Crenulated Flapwort	
Celaena leucostigma	Crescent	
Erica tetralix	Cross-leaved Heath	
Empetrum nigrum	Crowberry agg.	
Cardamine pratensis	Cuckooflower	
Philaenus spumarius	Cuckoo-Spit Insect	
Rumex crispus	Curled Dock	
Numenius arquata	Curlew	
Barbula cylindrica	Cylindric Beard-moss	
Apamea monoglypha	Dark Arches	
Chloroclysta citrata	Dark Marbled Carpet	
Agrotis ipsilon	Dark Sword-grass	
Trichophorum cespitosum	Deergrass	
Dichodontium pellucidum	Dichodontium pellucidum	
Rhizomnium punctatum	Dotted Thyme-moss	
Calidris alpina	Dunlin	
Apamea remissa	Dusky Brocade	
Aira praecox	Early Hair-grass	
Somateria mollissima	Eider	
Empis trigramma	Empis trigramma	
Erigone atra	Erigone atra	
Eupeodes corollae	Eupeodes corollae	
Lutra lutra	European Otter	

Oryctolagus cuniculus	European Rabbit	
Barbula fallax	Fallacious Beard-moss	
Sphagnum cuspidatum	Feathery Bog-moss	
Eleocharis quinqueflora	Few-flowered Spike-rush	
Equisetum arvense	Field Horsetail	
Sparganium angustifolium	Floating Bur-reed	
Philonotis fontana	Fountain Apple-moss	
Libellula quadrimaculata	Four-spotted Chaser	
Sphagnum fimbriatum	Fringed Bog-moss	
Ulota phyllantha	Frizzled Pincushion	
Fuscidea cyathoides	Fuscidea cyathoides	
Fuscidea lygaea	Fuscidea lygaea	
Gammarus duebeni	Gammarus duebeni	
Sula bassana	Gannet	
Xanthorhoe fluctuata	Garden Carpet	
Hylocomium splendens	Glittering Wood-moss	
Plusia festucae	Gold Spot	
Pluvialis apricaria	Golden Plover	
Aneura pinguis	Greasewort	
Larus marinus	Great Black-backed Gull	
Eurois occulta	Great Brocade	
Gavia immer	Great Northern Diver	
Stercorarius skua	Great Skua	
Dicranum majus	Greater Fork-moss	
Urocerus gigas	Greater Horntail Wasp	
Fontinalis antipyretica	Greater Water-moss	
Racomitrium fasciculare	Green Mountain Fringe-moss	
Carex binervis	Green-ribbed Sedge	
Ardea cinerea	Grey Heron	
Halichoerus grypus	Grey Seal	
Grimmia pulvinata	Grey-cushioned Grimmia	
Anser anser	Greylag Goose	
Blechnum spicant	Hard-fern	
Eriophorum vaginatum	Hare's-tail Cottongrass	
Plagiomnium undulatum	Hart's-tongue Thyme-moss	
Celaena haworthii	Haworth's Minor	
Calliergon cordifolium	Heart-leaved Spear-moss	
Galium saxatile	Heath Bedstraw	
Bombus jonellus	Heath Bumble Bee	
Hypnum jutlandicum	Heath Plait-moss	
Juncus squarrosus	Heath Rush	
Dactylorhiza maculata	Heath Spotted-orchid	
Campylopus introflexus	Heath Star Moss	
Calluna vulgaris	Heather	
Scoliopteryx libatrix	Herald	
Larus argentatus	Herring Gull	
Larus argentatus subsp. argentatus	Herring Gull	
Orthotrichum cupulatum	Hooded Bristle-moss	
Corvus cornix	Hooded Crow	
Corvus corone subsp. cornix	Hooded Crow	
Passer domesticus	House Sparrow	
Megaptera novaeangliae	Humpback Whale	
Hypnum cupressiforme	Hypnum cupressiforme	
Hypogymnia tubulosa	Hypogymnia tubulosa	
Amphipoea	Indet. Ear Moth	
Gymnocolea inflata	Inflated Notchwort	
Diarsia mendica subsp. thulei	Ingrailed Clay	
Callitriche hamulata	Intermediate Water-Starwort	
Isothecium myosuroides var. brachythecioides	Isothecium myosuroides var. brachythecioides	
Riccardia chamedryfolia	Jagged Germanderwort	
Lophozia incisa	Jagged Notchwort	
Juncus articulatus	Jointed Rush	

Hydriomena furcata	July Highflyer	
Polytrichum juniperinum	Juniper Haircap	
Orcinus orca	Killer Whale	
Calidris canutus	Knot	
Nardia scalaris	Ladder Flapwort	
Vanellus vanellus	Lapwing	
Pyrrhosoma nymphula	Large Red Damselfly	
Pieris brassicae	Large White	
Noctua pronuba	Large Yellow Underwing	
Lecanora albescens	Lecanora albescens	
Lecanora dispersa	Lecanora dispersa	
Lecanora expallens	Lecanora expallens	
Lecanora poliophaea	Lecanora poliophaea	
Lecanora polytropa	Lecanora polytropa	
Lecanora sulphurea	Lecanora sulphurea	
Lecidea diducens	Lecidea diducens	
Lecidella asema	Lecidella asema	
Lecidella scabra	Lecidella scabra	
Lecidella stigmatea	Lecidella stigmatea	
Lejogaster metallina	Lejogaster metallina	
Cotula squalida	Leptinella	
Barbula convoluta var. convoluta	Lesser Bird's-claw Beard-moss	Rare (Shetland)
Plagiochila porelloides	Lesser Featherwort	
Spergularia marina	Lesser Sea-spurrey	Scarce (Shetland)
Ranunculus flammula subsp. flammula	Lesser Spearwort	
Limnephilidae	Limnephilidae	
Rhytidiadelphus loreus	Little Shaggy-moss	
Globicephala melaena	Long-finned Pilot Whale	
Sphagnum subnitens	Lustrous Bog-moss	
Sphagnum magellanicum	Magellanic Bog-moss	
Anas platyrhynchos	Mallard	
Hepialus fusconebulosa	Map-winged Swift	
Triglochin palustre	Marsh Arrowgrass	
Dicranella palustris	Marsh Forklet-moss	
Alopecurus geniculatus	Marsh Foxtail	
Cirsium palustre	Marsh Thistle	
Viola palustris subsp. palustris	Marsh Violet	
Acrocephalus palustris	Marsh Warbler	
Caltha palustris	Marsh-marigold	
Marsupella emarginata var. emarginata	Marsupella emarginata var. emarginata	
Ranunculus acris	Meadow Buttercup	
Anthus pratensis	Meadow Pipit	
Parmelia glabratula subsp. fuliginosa	Melanelixia fuliginosa	
Melanostoma mellinum	Melanostoma mellinum	
Falco columbarius	Merlin	Schedule 1
Balaenoptera acutorostrata	Minke Whale	
Gallinula chloropus	Moorhen	
Bombus muscorum	Moss Carder-bee	
Lepus timidus	Mountain Hare	
Calypogeia muelleriana	Mueller's Pouchwort	
Acarospora smaragdula	Myriospora smaragdula	
Myrmica ruginodis	Myrmica ruginodis	
Pipistrellus nathusii	Nathusius's Pipistrelle	
Pseudoscleropodium purum	Neat Feather-moss	
Pellia neesiana	Nees' Pellia	
Neomysis integer	Neomysis integer	
Parmelia sulcata	Netted Shield Lichen	
Pohlia nutans	Nodding Thread-moss	
Chironomidae	Non-biting midges	
Standfussiana lucernea	Northern Rustic	
Puccinellia distans subsp. borealis	Northern Saltmarsh-grass	
Eulithis populata	Northern Spinach	

Bombus magnus	Northern White-tailed Bumblebee	
Discestra trifolii	Nutmeg	
Oedothorax fuscus	Oedothorax fuscus	
Daphnis nerii	Oleander Hawk-moth	
Oligochaeta	Oligochaeta	
Omphalina hepatica	Omphalina subhepatica	
Opegrapha atra	Opegrapha atra	
Opegrapha multipuncta	Opegrapha multipuncta	
Orthocladius species A.	Orthocladius species A.	
Pellia epiphylla	Overleaf Pellia	
Haematopus ostralegus	Oystercatcher	
Cynthia cardui	Painted Lady	
Vanessa cardui	Painted Lady	
Pohlia wahlenbergii	Pale Glaucous Thread-moss	
Cephalozia leucantha	Pale Pincerwort	
Udea lutealis	Pale Straw Pearl	
Bryum pallens	Pale Thread-moss	
Riccardia palmata	Palmate Germanderwort	
Sphagnum papillosum	Papillose Bog-moss	
Ochrolechia parella	Parelle	
Parmelia saxatilis	Parmelia saxatilis	
Peltigera hymenina	Peltigera hymenina	
Peltigera membranacea	Peltigera membranacea	
Peponocranium ludicrum	Peponocranium ludicrum	
Potamogeton perfoliatus	Perfoliate Pondweed	
Pertusaria pseudocorallina	Pertusaria pseudocorallina	
Phaeophyscia orbicularis	Phaeophyscia orbicularis	
Pholcomma gibbum	Pholcomma gibbum	
Physcia caesia	Physcia caesia	
Motacilla alba subsp. yarrellii	Pied Wagtail	
Conopodium majus	Pignut	
Hygrocybe calyptraeformis	Pink Waxcap	
Platycheirus albimanus	Platycheirus albimanus	
Platycheirus manicatus	Platycheirus manicatus	
Calliergon cuspidatum	Pointed Spear-moss	
Polypodium vulgare agg.	Polypody	
Polytrichum commune var. commune	Polytrichum commune var. commune	
Fucus vesiculosus	Popweed	
Porpidia macrocarpa	Porpidia macrocarpa	
Porpidia tuberculosa	Porpidia tuberculosa	
Procladius	Procladius	
Sagina procumbens	Procumbent Pearlwort	
Calidris maritima	Purple Sandpiper	
Coturnix coturnix	Quail	
Lychnis flos-cuculi	Ragged-Robin	
Ramalina cuspidata	Ramalina cuspidata	
Ramalina subfarinacea	Ramalina subfarinacea	
Corvus corax	Raven	
Vanessa atalanta	Red Admiral	
Sphagnum capillifolium	Red Bog-moss	
Silene dioica	Red Campion	
Xanthorhoe munitata	Red Carpet	
Trifolium pratense	Red Clover	
Festuca rubra agg.	Red Fescue	
Lagopus lagopus subsp. scotica	Red Grouse	
Xylena vetusta	Red Sword-grass	
Mergus serrator	Red-breasted Merganser	
Ceratodon purpureus	Redshank	
Tringa totanus	Redshank	
Pleurozium schreberi	Red-stemmed Feather-moss	
Gavia stellata	Red-throated Diver	Schedule 1
Cladonia portentosa	Reindeer Moss	

Rhizocarpon geographicum	Rhizocarpon geographicum	
Rhizocarpon obscuratum	Rhizocarpon lavatum	
Rhizocarpon richardii	Rhizocarpon richardii	
Barbula rigidula	Rigid Beard-moss	
Charadrius hiaticula	Ringed Plover	
Drepanocladus exannulatus	Ringless Hook-moss	
Rinodina atrocinerea	Rinodina atrocinerea	
Grampus griseus	Risso's Dolphin	
Brachythecium rivulare	River Feather-moss	
Pseudobryum cinclidioides	River Thyme-moss	
Lepidozia cupressina	Rock Fingerwort	Scarce (Shetland)
Anthus petrosus	Rock Pipit	
Rhigognostis senilella	Rock-cress Smudge	
Chamerion angustifolium	Rosebay Willowherb	Rare (Shetland)
Brachythecium rutabulum	Rough-stalked Feather-moss	
Drosera rotundifolia	Round-leaved Sundew	
Bactra lancealana	Rush Marble	
Brachythecium plumosum	Rusty Feather-moss	
Drepanocladus revolvens	Rusty Hook-moss	
Campylopus paradoxus	Rusty Swan-neck Moss	
Juncus gerardii	Saltmarsh Rush	
Savignia frontata	Savignia frontata	
Syngrapha interrogationis	Scarce Silver Y	
Scathophaga stercoraria	Scathophaga stercoraria	
Schaereria fuscocinerea	Schaereria fuscocinerea	
Scoliciosporium umbrinum	Scoliciosporum umbrinum	
Cochlearia officinalis subsp. scotica	Scottish Scurvygrass	
Triglochin maritimum	Sea Arrowgrass	
Ramalina siliquosa	Sea ivory	
Sagina maritima	Sea Pearlwort	
Plantago maritima	Sea Plantain	
Ligia oceanica	Sea Slater	
Glaux maritima	Sea-milkwort	
Balaenoptera borealis	Sei Whale	
Phalacrocorax aristotelis	Shag	
Rumex acetosella	Sheep's Sorrel	
Jasione montana	Sheep's-bit	
Homalothecium sericeum	Silky Wall Feather-moss	
Silometopus ambiguus	Silometopus ambiguus	
Autographa gamma	Silver Y	
Alauda arvensis	Skylark	
Eleocharis uniglumis	Slender Spike-rush	Scarce (Shetland)
Lecanora rupicola	Slow-growing Lichen	
Ophioglossum azoricum	Small Adder's-tongue	
Bombus hortorum	Small Garden Bumble Bee	
Photedes pygmina	Small Wainscot	
Gallinago gallinago	Snipe	
Sphagnum tenellum	Soft Bog-moss	
Juncus effusus	Soft-rush	
Cirsium vulgare	Spear Thistle	
Sphagnum auriculatum	Sphagnum denticulatum	
Sphagnum recurvum	Sphagnum recurvum	
Sphagnum squarrosum	Spiky Bog-moss	
Ruppia cirrhosa	Spiral Tasselweed	
Poa humilis	Spreading Meadow-grass	
Scilla verna	Spring Squill	
Rhytidiadelphus squarrosus	Springy Turf-moss	
Xestia xanthographa	Square-spot Rustic	
Chiloscyphus polyanthus var. pallescens	St Winifrid's Other Moss	
Sturnus vulgaris	Starling	
Mustela erminea	Stoat	
Bartramia ithyphylla	Straight-leaved Apple-moss	

Agriphila straminella	Straw Grass-veneer	
Calliergon stramineum	Straw Spear-moss	
Polytrichum alpestre	Strict Haircap	
Mnium hornum	Swan's-neck Thyme-moss	Scarce (Shetland)
Anthoxanthum odoratum	Sweet Vernal-grass	
Frullania tamarisci	Tamarisk Scalewort	
Hydropunctaria maura	Tar Lichen	
Mylia taylori	Taylor's Flapwort	
Anas crecca	Teal	
Lepthyphantes tenuis	Tenuiphantes tenuis	
Lepthyphantes zimmermanni	Tenuiphantes zimmermanni	
Tetragnatha extensa	Tetragnatha extensa	
Aethes cnicana	Thistle Conch	
Armeria maritima subsp. maritima	Thrift	
Juncus bufonius agg.	Toad Rush agg.	
Potentilla erecta subsp. erecta	Tormentil	
Lycophotia porphyrea	True Lover's Knot	
Tubificidae	Tubificid Worm Sp.	
Lophozia ventricosa	Tumid Notchwort	
Arenaria interpres	Turnstone	
Perizoma didymata	Twin-spot Carpet	
Cephalozia bicuspidata	Two-horned Pincerwort	
Schistidium strictum	Upright Brown Grimmia	Rare (Shetland)
Verrucaria fusconigrescens	Verrucaria fusconigrescens	
Verrucaria striatula	Verrucaria striatula	
Tortula muralis	Wall Screw-moss	
Scapania undulata	Water Earwort	
Equisetum fluviatile	Water Horsetail	
Rallus aquaticus	Water Rail	
Plagiothecium undulatum	Waved Silk-moss	
Deschampsia flexuosa	Wavy Hair-grass	
Erinaceus europaeus	West European Hedgehog	
Scapania gracilis	Western Earwort	
Oenanthe oenanthe	Wheatear	
Numenius phaeopus	Whimbrel	Schedule 1
Trifolium repens	White Clover	
Diplophyllum albicans	White Earwort	
Carex curta	White Sedge	Scarce (Shetland)
Motacilla alba subsp. alba	White Wagtail	
Lagenorhynchus albirostris	White-beaked Dolphin	
Cygnus cygnus	Whooper Swan	
Anas penelope	Wigeon	
Lagopus lagopus	Willow Ptarmigan	
Kurzia sylvatica	Wood Fingerwort	
Nowellia curvifolia	Wood-rust	Scarce (Shetland)
Racomitrium lanuginosum	Woolly Fringe-moss	
Troglodytes troglodytes	Wren	
Racomitrium aciculare	Yellow Fringe-moss	
Iris pseudacorus	Yellow Iris	
Holcus lanatus	Yorkshire-fog	

Appendix 1: Desk Study NBN Data Sheet

Scientific name	Common name (where applicable)	Kingdom	Phylum	Class	Order	Family	Genus
Lumbrineris		Animalia	Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris
Capitella capitata	Gallery Worm	Animalia	Annelida	Polychaeta		Capitellidae	Capitella
Dorvillea		Animalia	Annelida	Polychaeta	Eunicida	Dorvilleidae	Dorvillea
Cirratulus cirratus		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Cirratulus
Paradoneis lyra		Animalia	Annelida	Polychaeta		Paraonidae	Paradoneis
Eteone		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteone
Oligochaeta	Earthworm	Animalia	Annelida	Oligochaeta			
Brada		Animalia	Annelida	Polychaeta	Terebellida	Flabelligeridae	Brada
Prionospio fallax		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Prionospio
Glycera alba		Animalia	Annelida	Polychaeta	Phyllodocida	Glyceridae	Glycera
Nereis		Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereis
Pherusa plumosa		Animalia	Annelida	Polychaeta	Terebellida	Flabelligeridae	Pherusa
Apistobranchus tullbergi		Animalia	Annelida	Polychaeta	Spionida	Apistobranchidae	Apistobranchus
Scoloplos (Scoloplos) armiger		Animalia	Annelida	Polychaeta		Orbiniidae	Scoloplos
Terebellidae		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	
Myrianida		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Myrianida
Dipolydora caulleryi		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Dipolydora
Spirorbis		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Spirorbis
Exogone (Exogone) verugera		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Exogone
Asclerocheilus intermedius		Animalia	Annelida	Polychaeta		Scalibregmatidae	Asclerocheilus
Nephtys		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Nereimyra punctata		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Nereimyra
Scalibregma inflatum		Animalia	Annelida	Polychaeta		Scalibregmatidae	Scalibregma
Owenia fusiformis		Animalia	Annelida	Polychaeta	Sabellida	Oweniidae	Owenia
Sphaerodorum gracilis		Animalia	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae	Sphaerodorum
Paradialychone filicaudata		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Paradialychone
Syllis		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Syllis
Chone duneri		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Chone
Pista cristata		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Pista
Notomastus latericeus		Animalia	Annelida	Polychaeta		Capitellidae	Notomastus
Aricidea (Acmira) catherinae		Animalia	Annelida	Polychaeta		Paraonidae	Aricidea
Ophelina acuminata		Animalia	Annelida	Polychaeta		Opheliidae	Ophelina
Chone infundibuliformis		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Chone
Sphaerosyllis hystrix		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Sphaerosyllis
Pareurythoe borealis		Animalia	Annelida	Polychaeta	Amphinomida	Amphinomidae	Pareurythoe
Spio symphyta		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spio
Maldanidae		Animalia	Annelida	Polychaeta		Maldanidae	
Hilbigneris gracilis		Animalia	Annelida	Polychaeta	Eunicida	Lumbrineridae	Hilbigneris
Caulleriella alata		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Caulleriella
Mediomastus fragilis		Animalia	Annelida	Polychaeta		Capitellidae	Mediomastus
Eusyllis blomstrandi		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Eusyllis
Syllidae		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	
Glycinde nordmanni		Animalia	Annelida	Polychaeta	Phyllodocida	Goniadidae	Glycinde
Terebellides stroemii		Animalia	Annelida	Polychaeta	Terebellida	Trichobranchidae	Terebellides
Nephtys cirrosa	White Catworm	Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Syllides longocirratus		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Syllides
Jasmineira caudata		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Jasmineira
Pseudopolydora antennata		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Pseudopolydora
Notophyllum foliosum		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Notophyllum

Oxydromus pallidus		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Oxydromus
Apistobranchus tenuis		Animalia	Annelida	Polychaeta	Spionida	Apistobranchidae	Apistobranchus
Kefersteinia cirrata		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Kefersteinia
Websterinereis glauca		Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae	Websterinereis
Spiophanes bombyx		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spiophanes
Eumida		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eumida
Pholoe inornata		Animalia	Annelida	Polychaeta	Phyllodocida	Pholoidae	Pholoe
Exogone (Exogone) naidina		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Exogone
Polydora		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Polydora
Prionospio		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Prionospio
Eunereis longissima		Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae	Eunereis
Syllis cornuta		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Syllis
Nephtys pente		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Pseudopolydora pulchra		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Pseudopolydora
Trichobranchus glacialis		Animalia	Annelida	Polychaeta	Terebellida	Trichobranchidae	Trichobranchus
Sphaerosyllis		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Sphaerosyllis
Chaetozone setosa		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Chaetozone
Nereididae		Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae	
Hydroides norvegicus		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Hydroides
Spirobranchus triqueter		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Spirobranchus
Odontosyllis gibba		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Odontosyllis
Aricidea		Animalia	Annelida	Polychaeta		Paraonidae	Aricidea
Nephtys caeca		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Parexogone hebes		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Parexogone
Nephtys hombergii		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Aonides paucibranchiata		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Aonides
Spio		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spio
Laonome kroyeri		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Laonome
Streblosoma bairdi		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Streblosoma
Eteone flava		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteone
Harmothoe	Scaleworm	Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Harmothoe
Spio armata		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spio
Praxillella praetermissa		Animalia	Annelida	Polychaeta		Maldanidae	Praxillella
Glycera		Animalia	Annelida	Polychaeta	Phyllodocida	Glyceridae	Glycera
Neoamphitrite figulus		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Neoamphitrite
Dipolydora coeca		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Dipolydora
Rhodine gracilior		Animalia	Annelida	Polychaeta		Maldanidae	Rhodine
Dodecaceria concharum		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Dodecaceria
Aricidea (Acmira) cerrutii		Animalia	Annelida	Polychaeta		Paraonidae	Aricidea
Prosphaerosyllis tetralix		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Prosphaerosyllis
Phyllodoce mucosa		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodoce
Cirratulidae		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	
Glycera lapidum		Animalia	Annelida	Polychaeta	Phyllodocida	Glyceridae	Glycera
Axionice maculata		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Axionice
Hypereteone lactea		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Hypereteone
Microphthalmus listensis		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Microphthalmus
Aphelochaeta marioni		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Aphelochaeta
Peresiella clymenoides		Animalia	Annelida	Polychaeta		Capitellidae	Peresiella
Poecilochaetus serpens		Animalia	Annelida	Polychaeta	Spionida	Poecilochaetidae	Poecilochaetus
Sosane sulcata		Animalia	Annelida	Polychaeta	Terebellida	Ampharetidae	Sosane

Syllis hyalina		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Syllis
Odontosyllis fulgurans		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Odontosyllis
Phyllodoce		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodoce
Pisione remota		Animalia	Annelida	Polychaeta	Phyllodocida	Sigalionidae	Pisione
Myriochele		Animalia	Annelida	Polychaeta	Sabellida	Oweniidae	Myriochele
Sphaerosyllis bulbosa		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Sphaerosyllis
Lanice conchilega	Sand Mason	Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Lanice
Clymenura borealis		Animalia	Annelida	Polychaeta		Maldanidae	Clymenura
Prionospio cirrifera		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Prionospio
Myriochele heeri		Animalia	Annelida	Polychaeta	Sabellida	Oweniidae	Myriochele
Pseudomystides limbata		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Pseudomystides
Goniada maculata		Animalia	Annelida	Polychaeta	Phyllodocida	Goniadidae	Goniada
Eumida sanguinea		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eumida
Dipolydora quadrilobata		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Dipolydora
Polycirrus		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Polycirrus
Eunoe nodosa		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Eunoe
Diplocirrus glaucus		Animalia	Annelida	Polychaeta	Terebellida	Flabelligeridae	Diplocirrus
Pseudosyllis brevipennis		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Pseudosyllis
Dipolydora giardi		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Dipolydora
Eteone longa		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteone
Circeis spirillum		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Circeis
Serpulidae		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	
Grania		Animalia	Annelida	Clitellata	Enchytraeida	Enchytraeidae	Grania
Gattyana cirrhosa		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Gattyana
Dipolydora flava		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Dipolydora
Ephesiella abyssorum		Animalia	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae	Ephesiella
Harmothoe imbricata		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Harmothoe
Phyllodoce groenlandica		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodoce
Oxydromus flexuosus		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Oxydromus
Malmgrenia lunulata		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Malmgrenia
Euclymene		Animalia	Annelida	Polychaeta		Maldanidae	Euclymene
Parasabella saxicola		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Parasabella
Exogone		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Exogone
Scolelepis (Parascolelepis) tridentata		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Scolelepis
Gyptis rosea		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Gyptis
Phisidia aurea		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Phisidia
Caulleriella killariensis		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Caulleriella
Nicolea venustula		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Nicolea
Jasmineira		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Jasmineira
Spiophanes kroyeri		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spiophanes
Serpula vermicularis		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Serpula
Streblosoma intestinale		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Streblosoma
Nicolea		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Nicolea
Lagis koreni		Animalia	Annelida	Polychaeta	Terebellida	Pectinariidae	Lagis
Streptosyllis websteri		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Streptosyllis
Cirriformia tentaculata		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Cirriformia
Protodorvillea kefersteini		Animalia	Annelida	Polychaeta	Eunicida	Dorvilleidae	Protodorvillea
Aglaophamus agilis		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus
Macrochaeta clavicornis		Animalia	Annelida	Polychaeta	Terebellida	Acrocirridae	Macrochaeta
Euchone rubrocincta		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Euchone

Schistomeringos neglecta		Animalia	Annelida	Polychaeta	Eunicida	Dorvilleidae	Schistomeringos
Petta pusilla		Animalia	Annelida	Polychaeta	Terebellida	Pectinariidae	Petta
Nephtys ciliata		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Sabellidae		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	
Eteoninae		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	
Amaeana trilobata		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Amaeana
Caulleriella		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Caulleriella
Polynoidae	Scale worm	Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	
Spio martinensis		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Spio
Tubificoides benedii		Animalia	Annelida	Clitellata	Haplotaxida	Tubificidae	Tubificoides
Eurysyllis tuberculata		Animalia	Annelida	Polychaeta	Phyllodocida	Syllidae	Eurysyllis
Chone		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Chone
Nephtys incisa		Animalia	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys
Paramphinome jeffreysii		Animalia	Annelida	Polychaeta	Amphinomida	Amphinomidae	Paramphinome
Sphaerodoropsis baltica		Animalia	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae	Sphaerodoropsis
Lysilla loveni		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Lysilla
Lepidonotus squamatus		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Lepidonotus
Polygordius appendiculatus		Animalia	Annelida	Polychaeta		Polygordiidae	Polygordius
Harmothoe impar		Animalia	Annelida	Polychaeta	Phyllodocida	Polynoidae	Harmothoe
Goniadella ? gracilis		Animalia	Annelida	Polychaeta	Phyllodocida	Goniadidae	Goniadella
Orbinia sertulata		Animalia	Annelida	Polychaeta		Orbiniidae	Orbinia
Laonice bahusiensis		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Laonice
Anobothrus gracilis		Animalia	Annelida	Polychaeta	Terebellida	Ampharetidae	Anobothrus
Myxicola infundibulum		Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	Myxicola
Syllidia armata		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Syllidia
Arenicola marina	Blow Lugworm	Animalia	Annelida	Polychaeta		Arenicolidae	Arenicola
Malacoceros tetracerus		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Malacoceros
Eulalia mustela		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eulalia
Phyllodocinae		Animalia	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	
Spirorbidae		Animalia	Annelida			Spirorbidae	
Chaetopterus variopedatus	Parchment Worm	Animalia	Annelida	Polychaeta		Chaetopteridae	Chaetopterus
Ampharete finmarchica		Animalia	Annelida	Polychaeta	Terebellida	Ampharetidae	Ampharete
Amphictene auricoma		Animalia	Annelida	Polychaeta	Terebellida	Pectinariidae	Amphictene
Caulleriella zetlandica		Animalia	Annelida	Polychaeta	Terebellida	Cirratulidae	Caulleriella
Capitella minima		Animalia	Annelida	Polychaeta		Capitellidae	Capitella
Chrysopetalum debile		Animalia	Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	Chrysopetalum
Aonides oxycephala		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Aonides
Spirobranchus		Animalia	Annelida	Polychaeta	Sabellida	Serpulidae	Spirobranchus
Sphaerodoridium minutum		Animalia	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae	Sphaerodoridium
Lumbrineris tetraura		Animalia	Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris
Nothria conchylega		Animalia	Annelida	Polychaeta	Eunicida	Onuphidae	Nothria
Malacoceros vulgaris		Animalia	Annelida	Polychaeta	Spionida	Spionidae	Malacoceros
Microphthalmus aberrans		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Microphthalmus
Podarkeopsis capensis		Animalia	Annelida	Polychaeta	Phyllodocida	Hesionidae	Podarkeopsis
Streblosoma		Animalia	Annelida	Polychaeta	Terebellida	Terebellidae	Streblosoma
Hediste diversicolor	Estuary Ragworm	Animalia	Annelida	Polychaeta	Phyllodocida	Nereididae	Hediste
Paradoxostoma tenuissimum		Animalia	Arthropoda	Ostracoda	Podocopida	Paradoxostomatidae	Paradoxostoma
Ixodes (Ceratixodes) uriae	Seabird Tick	Animalia	Arthropoda	Arachnida	Ixodida	Ixodidae	Ixodes
Enallagma cyathigerum	Common Blue Damselfly	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Enallagma
Callicorixa wollastoni		Animalia	Arthropoda	Insecta	Hemiptera	Corixidae	Callicorixa

Paranchus albipes		Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Paranchus
Myrmica ruginodis		Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Myrmica
Scathophaga stercoraria		Animalia	Arthropoda	Insecta	Diptera	Scathophagidae	Scathophaga
Calathus fuscipes		Animalia	Arthropoda	Insecta	Coleoptera	Carabidae	Calathus
Pyrrhosoma nymphula	Large Red Damselfly	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Pyrrhosoma
Calliphora uralensis	Seabird Bluebottle	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae	Calliphora
Libellula quadrimaculata	Four-spotted Chaser	Animalia	Arthropoda	Insecta	Odonata	Libellulidae	Libellula
Empis trigramma		Animalia	Arthropoda	Insecta	Diptera	Empididae	Empis
Anatis ocellata	Eyed Ladybird	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Anatis
Empididae		Animalia	Arthropoda	Insecta	Diptera	Empididae	
Chloroperlidae		Animalia	Arthropoda	Insecta	Plecoptera	Chloroperlidae	
Polycentropodidae		Animalia	Arthropoda	Insecta	Trichoptera	Polycentropodidae	
Chironomidae	Non-biting midges	Animalia	Arthropoda	Insecta	Diptera	Chironomidae	
Tipulidae	Cranefly	Animalia	Arthropoda	Insecta	Diptera	Tipulidae	
Hydracarina		Animalia	Arthropoda	Hydracarina			
Megamphopus cornutus		Animalia	Arthropoda	Malacostraca	Amphipoda	Photidae	Megamphopus
Pariambus typicus		Animalia	Arthropoda	Malacostraca	Amphipoda	Caprellidae	Pariambus
Ampelisca tenuicornis		Animalia	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	Ampelisca
Semibalanus balanoides	Acorn Barnacle	Animalia	Arthropoda	Maxillopoda	Sessilia	Archaeobalanidae	Semibalanus
Leptocheirus hirsutimanus		Animalia	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Leptocheirus
Leucothoe incisa		Animalia	Arthropoda	Malacostraca	Amphipoda	Leucothoidae	Leucothoe
Ampelisca spinipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	Ampelisca
Stenothoe marina		Animalia	Arthropoda	Malacostraca	Amphipoda	Stenothoidae	Stenothoe
Natatolana borealis		Animalia	Arthropoda	Malacostraca	Isopoda	Cirolanidae	Natatolana
Araphura brevimanus		Animalia	Arthropoda	Malacostraca	Tanaidacea	Tanaellidae	Araphura
Verruca stroemia		Animalia	Arthropoda	Maxillopoda	Sessilia	Verrucidae	Verruca
Urothoe elegans		Animalia	Arthropoda	Malacostraca	Amphipoda	Urothoidae	Urothoe
Scirtidae		Animalia	Arthropoda	Insecta	Coleoptera	Scirtidae	
Janira maculosa		Animalia	Arthropoda	Malacostraca	Isopoda	Janiridae	Janira
Cheirocratus sundevallii		Animalia	Arthropoda	Malacostraca	Amphipoda	Cheirocratidae	Cheirocratus
Lembos websteri		Animalia	Arthropoda	Malacostraca	Amphipoda	Aoridae	Lembos
Dexamine thea		Animalia	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Dexamine
Argissa hamatipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Argissidae	Argissa
Cheirocratus		Animalia	Arthropoda	Malacostraca	Amphipoda	Cheirocratidae	Cheirocratus
Dexamine spinosa		Animalia	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Dexamine
Phoxocephalus holbolli		Animalia	Arthropoda	Malacostraca	Amphipoda	Phoxocephalidae	Phoxocephalus
Phtisica marina		Animalia	Arthropoda	Malacostraca	Amphipoda	Caprellidae	Phtisica
Leptocheirus pectinatus		Animalia	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Leptocheirus
Gammaridea		Animalia	Arthropoda	Malacostraca	Amphipoda		
Monocorophium acherusicum		Animalia	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Monocorophium
Philomedes (Philomedes) lilljeborgi		Animalia	Arthropoda	Ostracoda	Myodocopida	Philomedidae	Philomedes
Microjassa cumbrensis		Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Microjassa
Crassicorophium bonellii		Animalia	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Crassicorophium
Harpinia antennaria		Animalia	Arthropoda	Malacostraca	Amphipoda	Phoxocephalidae	Harpinia
Socarnes erythrophthalmus		Animalia	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Socarnes
Nototropis vedlomensis		Animalia	Arthropoda	Malacostraca	Amphipoda	Atylidae	Nototropis
Gammaropsis maculata		Animalia	Arthropoda	Malacostraca	Amphipoda	Photidae	Gammaropsis
Pseudoprotella phasma		Animalia	Arthropoda	Malacostraca	Amphipoda	Caprellidae	Pseudoprotella
Apherusa bispinosa		Animalia	Arthropoda	Malacostraca	Amphipoda	Calliopiidae	Apherusa
Simuliidae	Black flies	Animalia	Arthropoda	Insecta	Diptera	Simuliidae	

Gnathia		Animalia	Arthropoda	Malacostraca	Isopoda	Gnathiidae	Gnathia
Anthura gracilis		Animalia	Arthropoda	Malacostraca	Isopoda	Anthuridae	Anthura
Liocarcinus depurator	Cleanser crab	Animalia	Arthropoda	Malacostraca	Decapoda	Polybiidae	Liocarcinus
Tanaopsis graciloides		Animalia	Arthropoda	Malacostraca	Tanaidacea	Tanaopsidae	Tanaopsis
Lysianassa plumosa		Animalia	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Lysianassa
Synchelidium haplocheles		Animalia	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae	Synchelidium
Amphilochoides serratipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Amphilochidae	Amphilochoides
Othomaera othonis		Animalia	Arthropoda	Malacostraca	Amphipoda	Maeridae	Othomaera
Aora		Animalia	Arthropoda	Malacostraca	Amphipoda	Aoridae	Aora
Metopa propinqua		Animalia	Arthropoda	Malacostraca	Amphipoda	Stenothoidae	Metopa
Campylaspis glabra		Animalia	Arthropoda	Malacostraca	Cumacea	Nannastacidae	Campylaspis
Nebalia bipes		Animalia	Arthropoda	Malacostraca	Nebaliacea	Nebaliidae	Nebalia
Apolochus neapolitanus		Animalia	Arthropoda	Malacostraca	Amphipoda	Amphilochidae	Apolochus
Gnathia oxyuraea		Animalia	Arthropoda	Malacostraca	Isopoda	Gnathiidae	Gnathia
Anoplodactylus petiolatus		Animalia	Arthropoda	Pycnogonida	Pantopoda	Phoxichilidiidae	Anoplodactylus
Liocarcinus pusillus		Animalia	Arthropoda	Malacostraca	Decapoda	Polybiidae	Liocarcinus
Tmetonyx similis		Animalia	Arthropoda	Malacostraca	Amphipoda	Uristidae	Tmetonyx
Akanthophoreus gracilis		Animalia	Arthropoda	Malacostraca	Tanaidacea	Akanthophoreidae	Akanthophoreus
Eusirus longipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Eusiridae	Eusirus
Tanaidacea		Animalia	Arthropoda	Malacostraca	Tanaidacea		
Aoridae		Animalia	Arthropoda	Malacostraca	Amphipoda	Aoridae	
Autonoe longipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Aoridae	Autonoe
Hippomedon denticulatus		Animalia	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Hippomedon
Eudorella truncatula		Animalia	Arthropoda	Malacostraca	Cumacea	Leuconidae	Eudorella
Parvipalpus capillaceus		Animalia	Arthropoda	Malacostraca	Amphipoda	Caprellidae	Parvipalpus
Isaea		Animalia	Arthropoda	Malacostraca	Amphipoda	Isaeidae	Isaea
Caprellidae		Animalia	Arthropoda	Malacostraca	Amphipoda	Caprellidae	
Cylindroleberis mariae		Animalia	Arthropoda	Ostracoda	Myodocopida	Cylindroleberididae	Cylindroleberis
Gitana sarsi		Animalia	Arthropoda	Malacostraca	Amphipoda	Amphilochidae	Gitana
Ampelisca typica		Animalia	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	Ampelisca
Cypridinoidea		Animalia	Arthropoda	Ostracoda	Myodocopida		
Gammaropsis palmata		Animalia	Arthropoda	Malacostraca	Amphipoda	Photidae	Gammaropsis
Amphilochoides boecki		Animalia	Arthropoda	Malacostraca	Amphipoda	Amphilochidae	Amphilochoides
Photis longicaudata		Animalia	Arthropoda	Malacostraca	Amphipoda	Photidae	Photis
Ampelisca brevicornis		Animalia	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	Ampelisca
Urothoe marina		Animalia	Arthropoda	Malacostraca	Amphipoda	Urothoidae	Urothoe
Halacaridae		Animalia	Arthropoda	Arachnida	Trombidiformes	Halacaridae	
Decapoda		Animalia	Arthropoda	Decapoda			
Balanus		Animalia	Arthropoda	Maxillopoda	Sessilia	Balanidae	Balanus
Callipallene brevirostris		Animalia	Arthropoda	Pycnogonida	Pantopoda	Callipallenidae	Callipallene
Metopa		Animalia	Arthropoda	Malacostraca	Amphipoda	Stenothoidae	Metopa
Synchelidium maculatum		Animalia	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae	Synchelidium
Perioculodes longimanus		Animalia	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae	Perioculodes
Pontocrates arenarius		Animalia	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae	Pontocrates
Ostracoda		Animalia	Arthropoda	Ostracoda			
Crassicorophium crassicorne		Animalia	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Crassicorophium
Leucothoe lilljeborgi		Animalia	Arthropoda	Malacostraca	Amphipoda	Leucothoidae	Leucothoe
Atelecyclus rotundatus	Circular Crab	Animalia	Arthropoda	Malacostraca	Decapoda	Atelecyclidae	Atelecyclus
Astacilla dilatata		Animalia	Arthropoda	Malacostraca	Isopoda	Arcturidae	Astacilla
Guernea (Guernea) coalita		Animalia	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Guernea

Prionotoleberis norvegica		Animalia	Arthropoda	Ostracoda	Myodocopida	Cylindroleberididae	Prionotoleberis
Cheirocratus intermedius		Animalia	Arthropoda	Malacostraca	Amphipoda	Cheirocratidae	Cheirocratus
Copepoda		Animalia	Arthropoda	Copepoda			
Animoceradocus semiserratus		Animalia	Arthropoda	Malacostraca	Amphipoda	Maeridae	Animoceradocus
Metaphoxus fultoni		Animalia	Arthropoda	Malacostraca	Amphipoda	Phoxocephalidae	Metaphoxus
Cheirocratus assimilis		Animalia	Arthropoda	Malacostraca	Amphipoda	Cheirocratidae	Cheirocratus
Megaluropus agilis		Animalia	Arthropoda	Malacostraca	Amphipoda	Megaluropidae	Megaluropus
Galathea intermedia		Animalia	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea
Bathyporeia		Animalia	Arthropoda	Malacostraca	Amphipoda	Bathyporeiidae	Bathyporeia
Cirripedia	Barnacle	Animalia	Arthropoda	Cirripedia			
Eurydice pulchra	Speckled Sea Louse	Animalia	Arthropoda	Malacostraca	Isopoda	Cirolanidae	Eurydice
Pandalus montagui	Pink Shrimp	Animalia	Arthropoda	Malacostraca	Decapoda	Pandalidae	Pandalus
Cumella (Cumella) pygmaea		Animalia	Arthropoda	Malacostraca	Cumacea	Nannastacidae	Cumella
Tryphosella sarsi		Animalia	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Tryphosella
Amphipoda		Animalia	Arthropoda	Amphipoda			
Socarnes filicornis		Animalia	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Socarnes
Eualus pusiolus		Animalia	Arthropoda	Malacostraca	Decapoda	Hippolytidae	Eualus
Gnathia dentata		Animalia	Arthropoda	Malacostraca	Isopoda	Gnathiidae	Gnathia
Ischyrocerus anguipes		Animalia	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	Ischyrocerus
Pagurus		Animalia	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus
Pagurus bernhardus	Hermit Crab	Animalia	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus
Hyperiidae		Animalia	Arthropoda	Malacostraca	Amphipoda	Hyperiidae	
Iphimedia obesa		Animalia	Arthropoda	Malacostraca	Amphipoda	Iphimediidae	Iphimedia
Anurida maritima		Animalia	Arthropoda	Collembola		Neanuridae	Anurida
Carcinus maenas	Green Shore Crab	Animalia	Arthropoda	Malacostraca	Decapoda	Portunidae	Carcinus
Leuctridae	Needle or willow stoneflies	Animalia	Arthropoda	Insecta	Plecoptera	Leuctridae	
Bathyporeia elegans		Animalia	Arthropoda	Malacostraca	Amphipoda	Bathyporeiidae	Bathyporeia
Austrosyrrhoe fimbriatus		Animalia	Arthropoda	Malacostraca	Amphipoda	Synopiidae	Austrosyrrhoe
Limnephilidae		Animalia	Arthropoda	Insecta	Trichoptera	Limnephilidae	
Muscidae		Animalia	Arthropoda	Insecta	Diptera	Muscidae	
Diastylis rugosa		Animalia	Arthropoda	Malacostraca	Cumacea	Diastylidae	Diastylis
Cancer pagurus	Edible crab	Animalia	Arthropoda	Malacostraca	Decapoda	Cancridae	Cancer
Idotea		Animalia	Arthropoda	Malacostraca	Isopoda	Idoteidae	Idotea
Galathea nexa		Animalia	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea
Hyas araneus	Great Spider Crab	Animalia	Arthropoda	Malacostraca	Decapoda	Oregoniidae	Hyas
Pagurus pubescens		Animalia	Arthropoda	Malacostraca	Decapoda	Paguridae	Pagurus
Oniscus asellus	Common Shiny Woodlouse	Animalia	Arthropoda	Malacostraca	Isopoda	Oniscidae	Oniscus
Inachus		Animalia	Arthropoda	Malacostraca	Decapoda	Inachidae	Inachus
Cumacea		Animalia	Arthropoda	Malacostraca	Cumacea		
Peltocoxa brevirostris		Animalia	Arthropoda	Malacostraca	Amphipoda	Cyproideidae	Peltocoxa
Ampelisca		Animalia	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	Ampelisca
Podoceridae		Animalia	Arthropoda	Malacostraca	Amphipoda	Podoceridae	
Ligia oceanica	Common Sea Slater	Animalia	Arthropoda	Malacostraca	Isopoda	Ligiidae	Ligia
Munida rugosa	Rugose Squat Lobster	Animalia	Arthropoda	Malacostraca	Decapoda	Munididae	Munida
Galathea squamifera		Animalia	Arthropoda	Malacostraca	Decapoda	Galatheidae	Galathea
Schizomavella (Schizomavella) linearis		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Bitectiporidae	Schizomavella
Alcyonidium gelatinosum		Animalia	Bryozoa	Gymnolaemata	Ctenostomatida	Alcyonidiidae	Alcyonidium
Fenestrulina malusii		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Microporellidae	Fenestrulina
Amphiblestrum solidum		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Amphiblestrum
Crassimarginatella solidula		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Crassimarginatella

Cribrilina annulata		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Cribrilinidae	Cribrilina
Oncousoecia dilatans		Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Oncousoeciidae	Oncousoecia
Escharella ventricosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Romancheinidae	Escharella
Haplopoma graniferum		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Haplopomidae	Haplopoma
Hippoporina pertusa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Bitectiporidae	Hippoporina
Phylactella labrosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Smittinidae	Phylactella
Crisia denticulata		Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Crisiidae	Crisia
Oncousoecia diastoporides		Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Oncousoeciidae	Oncousoecia
Amphiblestrum flemingii		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Amphiblestrum
Parasmittina trispinosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Smittinidae	Parasmittina
Escharoides coccinea		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Exochellidae	Escharoides
Callopora craticula		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Callopora
Porella compressa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Bryocryptellidae	Porella
Notoplites jeffreysii		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Candidae	Notoplites
Cribrilina punctata		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Cribrilinidae	Cribrilina
Microporella ciliata		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Microporellidae	Microporella
Aetea sica		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Aeteidae	Aetea
Smittoidea reticulata		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Smittinidae	Smittoidea
Callopora lineata		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Callopora
Amphiblestrum auritum		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Amphiblestrum
Bryozoa	Bryozoan	Animalia	Bryozoa				
Callopora dumerilii		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Callopora
Chorizopora brongniartii		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Chorizoporidae	Chorizopora
Porella concinna		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Bryocryptellidae	Porella
Pyripora catenularia		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Electridae	Pyripora
Neolagenipora collaris		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Romancheinidae	Neolagenipora
Ramphonotus minax		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Ramphonotus
Tegella unicornis		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae	Tegella
Omalosecosa ramulosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Celleporidae	Omalosecosa
Escharella immersa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Romancheinidae	Escharella
Electra pilosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Electridae	Electra
Membranipora membranacea	Sea Mat	Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Membraniporidae	Membranipora
Celleporina caliciformis		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Celleporidae	Celleporina
Cylindroporella tubulosa		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Lacernidae	Cylindroporella
Tubulipora phalangea		Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Tubuliporidae	Tubulipora
Flustrellidra hispida		Animalia	Bryozoa	Gymnolaemata	Ctenostomatida	Flustrellidridae	Flustrellidra
Puellina venusta		Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Cribrilinidae	Puellina
Crisiidae		Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Crisiidae	
Bryozoa indet crusts		Animalia	Bryozoa crusts				
Gavia stellata	Red-throated Diver	Animalia	Chordata	Aves	Gaviiformes	Gaviidae	Gavia
Numenius arquata	Curlew	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Numenius
Tringa totanus	Redshank	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Tringa
Gallinago gallinago	Snipe	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Gallinago
Anguilla anguilla	European Eel	Animalia	Chordata	Actinopterygii	Anguilliformes	Anguillidae	Anguilla
Vanellus vanellus	Lapwing	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Vanellus
Salmo trutta	Brown/Sea Trout	Animalia	Chordata	Actinopterygii	Salmoniformes	Salmonidae	Salmo
Oryctolagus cuniculus	European Rabbit	Animalia	Chordata	Mammalia	Lagomorpha	Leporidae	Oryctolagus
Phoca vitulina	Harbour Seal	Animalia	Chordata	Mammalia	Carnivora	Phocidae	Phoca
Linaria flavirostris	Twite	Animalia	Chordata	Aves	Passeriformes	Fringillidae	Linaria
Salmo salar	Atlantic Salmon	Animalia	Chordata	Actinopterygii	Salmoniformes	Salmonidae	Salmo

Lutra lutra	Eurasian Otter	Animalia	Chordata	Mammalia	Carnivora	Mustelidae	Lutra
Lepus timidus	Mountain Hare	Animalia	Chordata	Mammalia	Lagomorpha	Leporidae	Lepus
Mustela erminea	Stoat	Animalia	Chordata	Mammalia	Carnivora	Mustelidae	Mustela
Gasterosteus aculeatus	Three-spined Stickleback	Animalia	Chordata	Actinopterygii	Gasterosteiformes	Gasterosteidae	Gasterosteus
Arenaria interpres	Turnstone	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Arenaria
Anas crecca	Teal	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas
Gulosus aristotelis	Shag	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax
Mergus serrator	Red-breasted Merganser	Animalia	Chordata	Aves	Anseriformes	Anatidae	Mergus
Limosa lapponica	Bar-tailed Godwit	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Limosa
Phalacrocorax carbo	Cormorant	Animalia	Chordata	Aves	Pelecaniformes	Phalacrocoracidae	Phalacrocorax
Corvus cornix	Hooded Crow	Animalia	Chordata	Aves	Passeriformes	Corvidae	Corvus
Sturnus vulgaris	Starling	Animalia	Chordata	Aves	Passeriformes	Sturnidae	Sturnus
Haematopus ostralegus	Oystercatcher	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Haematopus
Anser anser	Greylag Goose	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anser
Anas platyrhynchos	Mallard	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas
Larus marinus	Great Black-backed Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Larus
Chroicocephalus ridibundus	Black-headed Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Chroicocephalus
Turdus merula	Blackbird	Animalia	Chordata	Aves	Passeriformes	Turdidae	Turdus
Ardea cinerea	Grey Heron	Animalia	Chordata	Aves	Ciconiiformes	Ardeidae	Ardea
Charadrius hiaticula	Ringed Plover	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Charadrius
Larus canus	Common Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Larus
Uria aalge	Common Guillemot	Animalia	Chordata	Aves	Charadriiformes	Alcidae	Uria
Cygnus cygnus	Whooper Swan	Animalia	Chordata	Aves	Anseriformes	Anatidae	Cygnus
Lymnocryptes minimus	Jack Snipe	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Lymnocryptes
Larus argentatus	Herring Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Larus
Pluvialis apricaria	Golden Plover	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Pluvialis
Calidris canutus	Knot	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Calidris
Falco peregrinus	Peregrine	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco
Corvus corax	Raven	Animalia	Chordata	Aves	Passeriformes	Corvidae	Corvus
Numenius phaeopus	Whimbrel	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Numenius
Sterna paradisaea	Arctic Tern	Animalia	Chordata	Aves	Charadriiformes	Laridae	Sterna
Calidris alpina	Dunlin	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Calidris
Larus fuscus	Lesser Black-backed Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Larus
Rissa tridactyla	Kittiwake	Animalia	Chordata	Aves	Charadriiformes	Laridae	Rissa
Clangula hyemalis	Long-tailed Duck	Animalia	Chordata	Aves	Anseriformes	Anatidae	Clangula
Pluvialis squatarola	Grey Plover	Animalia	Chordata	Aves	Charadriiformes	Charadriidae	Pluvialis
Phylloscopus trochilus	Willow Warbler	Animalia	Chordata	Aves	Passeriformes	Phylloscopidae	Phylloscopus
Lagopus lagopus	Red Grouse	Animalia	Chordata	Aves	Galliformes	Phasianidae	Lagopus
Fratercula arctica	Puffin	Animalia	Chordata	Aves	Charadriiformes	Alcidae	Fratercula
Mareca penelope	Wigeon	Animalia	Chordata	Aves	Anseriformes	Anatidae	Mareca
Alauda arvensis	Skylark	Animalia	Chordata	Aves	Passeriformes	Alaudidae	Alauda
Troglodytes troglodytes	Wren	Animalia	Chordata	Aves	Passeriformes	Troglodytidae	Troglodytes
Calidris alba	Sanderling	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Calidris
Somateria mollissima	Eider	Animalia	Chordata	Aves	Anseriformes	Anatidae	Somateria
Anthus pratensis	Meadow Pipit	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus
Dendrodoa grossularia	Baked Bean Ascidian	Animalia	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Dendrodoa
Gavia immer	Great Northern Diver	Animalia	Chordata	Aves	Gaviiformes	Gaviidae	Gavia
Tringa erythropus	Spotted Redshank	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Tringa
Botryllus schlosseri	Star Ascidian	Animalia	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Botryllus
Hydrobates pelagicus	Storm Petrel	Animalia	Chordata	Aves	Procellariiformes	Hydrobatidae	Hydrobates

Sterna hirundo	Common Tern	Animalia	Chordata	Aves	Charadriiformes	Laridae	Sterna
Falco columbarius	Merlin	Animalia	Chordata	Aves	Falconiformes	Falconidae	Falco
Oenanthe oenanthe	Wheatear	Animalia	Chordata	Aves	Passeriformes	Muscicapidae	Oenanthe
Pomatoschistus		Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	Pomatoschistus
Cepphus grylle	Black Guillemot	Animalia	Chordata	Aves	Charadriiformes	Alcidae	Cepphus
Corella parallelogramma	Gas Mantle Ascidian	Animalia	Chordata	Ascidiacea	Phlebobranchia	Corellidae	Corella
Molgula complanata		Animalia	Chordata	Ascidiacea	Stolidobranchia	Molgulidae	Molgula
Stercorarius skua	Great Skua	Animalia	Chordata	Aves	Charadriiformes	Stercorariidae	Stercorarius
Columba livia	Rock Dove	Animalia	Chordata	Aves	Columbiformes	Columbidae	Columba
Bucephala clangula	Goldeneye	Animalia	Chordata	Aves	Anseriformes	Anatidae	Bucephala
Hydrocoloeus minutus	Little Gull	Animalia	Chordata	Aves	Charadriiformes	Laridae	Hydrocoloeus
Fulmarus glacialis	Fulmar	Animalia	Chordata	Aves	Procellariiformes	Procellariidae	Fulmarus
Branta canadensis	Canada Goose	Animalia	Chordata	Aves	Anseriformes	Anatidae	Branta
Stercorarius parasiticus	Arctic Skua	Animalia	Chordata	Aves	Charadriiformes	Stercorariidae	Stercorarius
Ficedula hypoleuca	Pied Flycatcher	Animalia	Chordata	Aves	Passeriformes	Muscicapidae	Ficedula
Callionymus lyra	Common Dragonet	Animalia	Chordata	Actinopterygii	Perciformes	Callionymidae	Callionymus
Tringa nebularia	Greenshank	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Tringa
Actitis hypoleucos	Common Sandpiper	Animalia	Chordata	Aves	Charadriiformes	Scolopacidae	Actitis
Pomatoschistus pictus	Painted Goby	Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	Pomatoschistus
Pholis gunnellus	Butterfish	Animalia	Chordata	Actinopterygii	Perciformes	Pholidae	Pholis
Gobiusculus flavescens	Two-spotted Goby	Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	Gobiusculus
Anthozoa	Invertebrates (Sea Anemones)	Animalia	Cnidaria				
Sertularia argentea		Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Sertularia
Hydrallmania falcata	Sickle hydroid	Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Hydrallmania
Thuiaria thuja	Bottlebrush Hydroid	Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Thuiaria
Clytia hemisphaerica		Animalia	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae	Clytia
Edwardsia		Animalia	Cnidaria	Anthozoa	Actiniaria	Edwardsiidae	Edwardsia
Obelia geniculata		Animalia	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae	Obelia
Virgularia mirabilis	Slender Sea Pen	Animalia	Cnidaria	Anthozoa	Pennatulacea	Virgulariidae	Virgularia
Thuiaria articulata		Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Thuiaria
Abietinaria abietina		Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Abietinaria
Hydractinia echinata		Animalia	Cnidaria	Hydrozoa	Anthoathecata	Hydractiniidae	Hydractinia
Clava multicornis	Club-headed Hydroid	Animalia	Cnidaria	Hydrozoa	Anthoathecata	Hydractiniidae	Clava
Alcyonium digitatum	Dead men's fingers	Animalia	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Alcyonium
Dynamena pumila		Animalia	Cnidaria	Hydrozoa	Leptothecata	Sertulariidae	Dynamena
Laomedea flexuosa		Animalia	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae	Laomedea
Actinia equina	Beadlet anemone	Animalia	Cnidaria	Anthozoa	Actiniaria	Actiniidae	Actinia
Kirchenpaueria pinnata		Animalia	Cnidaria	Hydrozoa	Leptothecata	Kirchenpaueriidae	Kirchenpaueria
Urticina felina	Dahlia anemone	Animalia	Cnidaria	Anthozoa	Actiniaria	Actiniidae	Urticina
Coryne muscoides		Animalia	Cnidaria	Hydrozoa	Anthoathecata	Corynidae	Coryne
Cereus pedunculatus	Daisy anemone	Animalia	Cnidaria	Anthozoa	Actiniaria	Sagartiidae	Cereus
Crustacea		Animalia	Crustacea				
Ophiura		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiura
Ophiura albida	Serpent's Table Brittlestar	Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiura
Ophiothrix fragilis	Common Brittlestar	Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiotrichidae	Ophiothrix
Amphipholis squamata		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Amphiuridae	Amphipholis
Paraleptopentacta elongata		Animalia	Echinodermata	Holothuroidea	Dendrochirotida	Cucumariidae	Paraleptopentacta
Ophiocten affinis		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiocten
Leptosynapta inhaerens		Animalia	Echinodermata	Holothuroidea	Apodida	Synaptidae	Leptosynapta
Leptasterias (Leptasterias) muelleri		Animalia	Echinodermata	Asteroidea	Forcipulatida	Asteriidae	Leptasterias

Asterias rubens	Common starfish	Animalia	Echinodermata	Asteroidea	Forcipulatida	Asteriidae	Asterias
Antedon bifida	Rosy Feather-star	Animalia	Echinodermata	Crinoidea	Comatulida	Antedonidae	Antedon
Echinocyamus pusillus	Pea Urchin	Animalia	Echinodermata	Echinoidea	Clypeasteroida	Echinocyamidae	Echinocyamus
Amphiura		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Amphiuridae	Amphiura
Astropecten irregularis	Sand Star	Animalia	Echinodermata	Asteroidea	Paxillosida	Astropectinidae	Astropecten
Asteroidea	Starfish	Animalia	Echinodermata	Asteroidea			
Psammechinus miliaris	Green Sea Urchin	Animalia	Echinodermata	Echinoidea	Camarodonta	Parechinidae	Psammechinus
Echinocardium pennatifidum		Animalia	Echinodermata	Echinoidea	Spatangoida	Loveniidae	Echinocardium
Amphiura (Ophiopeltis) securigera		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Amphiuridae	Amphiura
Crossaster papposus	Common Sun Star	Animalia	Echinodermata	Asteroidea	Valvatida	Solasteridae	Crossaster
Echinocardium flavescens		Animalia	Echinodermata	Echinoidea	Spatangoida	Loveniidae	Echinocardium
Holothuria		Animalia	Echinodermata	Holothuroidea	Aspidochirotida	Holothuriidae	Holothuria
Echinoidea	Sea Urchin	Animalia	Echinodermata	Echinoidea			
Amphiura filiformis		Animalia	Echinodermata	Ophiuroidea	Ophiurida	Amphiuridae	Amphiura
Echinus esculentus	Edible Sea Urchin	Animalia	Echinodermata	Echinoidea	Camarodonta	Echinidae	Echinus
Solaster endeca	Purple Sun Star	Animalia	Echinodermata	Asteroidea	Valvatida	Solasteridae	Solaster
Porania (Porania) pulvillus	Red Cushion Star	Animalia	Echinodermata	Asteroidea	Valvatida	Poraniidae	Porania
Ophiopholis aculeata	Crevice Brittlestar	Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiactidae	Ophiopholis
Henricia		Animalia	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia
Ophiocomina nigra	Black brittlestar	Animalia	Echinodermata	Ophiuroidea	Ophiurida	Ophiocomidae	Ophiocomina
Henricia sanguinolenta		Animalia	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia
Anatoma crispata		Animalia	Mollusca	Gastropoda		Anatomidae	Anatoma
Abra alba		Animalia	Mollusca	Bivalvia	Veneroida	Semelidae	Abra
Thyasira flexuosa		Animalia	Mollusca	Bivalvia	Lucinoida	Thyasiridae	Thyasira
Kurtiella bidentata		Animalia	Mollusca	Bivalvia	Veneroida	Montacutidae	Kurtiella
Patella vulgata	Common Limpet	Animalia	Mollusca	Gastropoda		Patellidae	Patella
Timoclea ovata	Oval Venus	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Timoclea
Parvicardium pinnulatum		Animalia	Mollusca	Bivalvia	Veneroida	Cardiidae	Parvicardium
Lucinoma borealis		Animalia	Mollusca	Bivalvia	Lucinoida	Lucinidae	Lucinoma
Melarhaphe neritoides	Small Periwinkle	Animalia	Mollusca	Gastropoda	Littorinimorpha	Littorinidae	Melarhaphe
Mytilus edulis	Blue Mussel	Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Mytilus
Tellina fabula	Bean-Like Tellin	Animalia	Mollusca	Bivalvia	Veneroida	Tellinidae	Tellina
Thracia convexa		Animalia	Mollusca	Bivalvia	Anomalodesmata	Thraciidae	Thracia
Chamelea striatula	Striped Venus	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Chamelea
Parvicardium scabrum		Animalia	Mollusca	Bivalvia	Veneroida	Cardiidae	Parvicardium
Abra nitida		Animalia	Mollusca	Bivalvia	Veneroida	Semelidae	Abra
Mya truncata	Blunt gaper	Animalia	Mollusca	Bivalvia	Myoida	Myidae	Mya
Littorina saxatilis/arcana	Rough Periwinkle	Animalia	Mollusca	Gastropoda	Littorinimorpha	Littorinidae	Littorina
Littorina obtusata/fabalis		Animalia	Mollusca	Gastropoda	Littorinimorpha	Littorinidae	Littorina
Mya arenaria	Sand Gaper	Animalia	Mollusca	Bivalvia	Myoida	Myidae	Mya
Crenella decussata		Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Crenella
Diaphana minuta		Animalia	Mollusca	Gastropoda	Cephalaspidea	Diaphanidae	Diaphana
Leptochiton asellus		Animalia	Mollusca	Polyplacophora	Lepidopleurida	Leptochitonidae	Leptochiton
Arctica islandica	Icelandic Cyprine	Animalia	Mollusca	Bivalvia	Veneroida	Arcticidae	Arctica
Pyramidellidae		Animalia	Mollusca	Gastropoda		Pyramidellidae	
Modiolus		Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Modiolus
Laona		Animalia	Mollusca	Gastropoda	Cephalaspidea	Philinidae	Laona
Polyplacophora	Chitons	Animalia	Mollusca	Polyplacophora			
Doridacea		Animalia	Mollusca	Gastropoda	Nudibranchia		
Lasaeidae		Animalia	Mollusca	Bivalvia	Veneroida	Lasaeidae	

Tectura virginea	White Tortoiseshell Limpet	Animalia	Mollusca	Gastropoda		Lottiidae	Tectura
Corbula gibba	Common basket-shell	Animalia	Mollusca	Bivalvia	Myoida	Corbulidae	Corbula
Modiolus modiolus	Horse-mussel	Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Modiolus
Asbjornsenia pygmaea		Animalia	Mollusca	Bivalvia	Veneroida	Tellinidae	Asbjornsenia
Dosinia lupinus	Smooth Artemis	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Dosinia
Aeolidioidea		Animalia	Mollusca	Gastropoda	Nudibranchia		
Clausinella fasciata	Banded Venus	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Clausinella
Polititapes rhomboides	Banded Carpet Shell	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Polititapes
Ensis magnus		Animalia	Mollusca	Bivalvia	[unassigned] Euheterodonta	Pharidae	Ensis
Nucella lapillus	Dog Whelk	Animalia	Mollusca	Gastropoda	Neogastropoda	Muricidae	Nucella
Hiatella arctica	Wrinkled Rock Borer	Animalia	Mollusca	Bivalvia	[unassigned] Euheterodonta	Hiatellidae	Hiatella
Cochlodesma praetenue		Animalia	Mollusca	Bivalvia	Anomalodesmata	Periplomatidae	Cochlodesma
Steromphala cineraria	Grey Top Shell	Animalia	Mollusca	Gastropoda		Trochidae	Steromphala
Anomiidae		Animalia	Mollusca	Bivalvia	Pectinoida	Anomiidae	
Gastropoda	Snails	Animalia	Mollusca	Gastropoda			
Gari tellinella		Animalia	Mollusca	Bivalvia	Veneroida	Psammobiidae	Gari
Moerella donacina		Animalia	Mollusca	Bivalvia	Veneroida	Tellinidae	Moerella
Nucula nucleus		Animalia	Mollusca	Bivalvia	Nuculida	Nuculidae	Nucula
Gibbula		Animalia	Mollusca	Gastropoda		Trochidae	Gibbula
Abra prismatica		Animalia	Mollusca	Bivalvia	Veneroida	Semelidae	Abra
Mya		Animalia	Mollusca	Bivalvia	Myoida	Myidae	Mya
Aequipecten opercularis	Queen scallop	Animalia	Mollusca	Bivalvia	Pectinoida	Pectinidae	Aequipecten
Odostomia		Animalia	Mollusca	Gastropoda		Pyramidellidae	Odostomia
Spisula elliptica		Animalia	Mollusca	Bivalvia	Veneroida	Mactridae	Spisula
Montacuta substriata		Animalia	Mollusca	Bivalvia	Veneroida	Montacutidae	Montacuta
Thyasira gouldi	Northern hatchet shell	Animalia	Mollusca	Bivalvia	Lucinoida	Thyasiridae	Thyasira
Gari fervensis	Faroe Sunset Shell	Animalia	Mollusca	Bivalvia	Veneroida	Psammobiidae	Gari
Raphitoma linearis		Animalia	Mollusca	Gastropoda	Neogastropoda	Raphitomidae	Raphitoma
Astarte elliptica		Animalia	Mollusca	Bivalvia	Carditoida	Astartidae	Astarte
Abra		Animalia	Mollusca	Bivalvia	Veneroida	Semelidae	Abra
Thracia phaseolina		Animalia	Mollusca	Bivalvia	Anomalodesmata	Thraciidae	Thracia
Nucula nitidosa		Animalia	Mollusca	Bivalvia	Nuculida	Nuculidae	Nucula
Glycymeris glycymeris	Dog-cockle	Animalia	Mollusca	Bivalvia	Arcoida	Glycymeridae	Glycymeris
Limatula subauriculata		Animalia	Mollusca	Bivalvia	Limoida	Limidae	Limatula
Musculus discors	Green Crenella	Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Musculus
Euspira montagui		Animalia	Mollusca	Gastropoda	Littorinimorpha	Naticidae	Euspira
Euspira nitida	Alder's Necklace Shell	Animalia	Mollusca	Gastropoda	Littorinimorpha	Naticidae	Euspira
Myrtea spinifera		Animalia	Mollusca	Bivalvia	Lucinoida	Lucinidae	Myrtea
Mytilacea		Animalia	Mollusca				
Patella pellucida	Blue rayed limpet	Animalia	Mollusca	Gastropoda		Patellidae	Patella
Cylichna cylindracea		Animalia	Mollusca	Gastropoda	Cephalaspidea	Cylichnidae	Cylichna
Chlamys		Animalia	Mollusca	Bivalvia	Pectinoida	Pectinidae	Chlamys
Jorunna tomentosa/artsdatabankia		Animalia	Mollusca	Gastropoda	Nudibranchia	Discodorididae	Jorunna
Chaetoderma nitidulum		Animalia	Mollusca	Caudofoveata	Chaetodermatida	Chaetodermatidae	Chaetoderma
Turritellinella tricarinata	Auger Shell	Animalia	Mollusca	Gastropoda	[unassigned] Caenogastropoda	Turritellidae	Turritellinella
Eulima bilineata		Animalia	Mollusca	Gastropoda	[unassigned] Caenogastropoda	Eulimidae	Eulima
Littorina obtusata	Flat Periwinkle	Animalia	Mollusca	Gastropoda	Littorinimorpha	Littorinidae	Littorina
Calliostoma zizyphinum	Painted top shell	Animalia	Mollusca	Gastropoda		Calliostomatidae	Calliostoma
Patella		Animalia	Mollusca	Gastropoda		Patellidae	Patella
Goodallia triangularis		Animalia	Mollusca	Bivalvia	Carditoida	Astartidae	Goodallia

Musculus subpictus	Marbled Crenella	Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae	Musculus
Skeneopsis planorbis		Animalia	Mollusca	Gastropoda	Littorinimorpha	Skeneopsidae	Skeneopsis
Phaxas pellucidus		Animalia	Mollusca	Bivalvia	[unassigned] Euheterodonta	Pharidae	Phaxas
Testudinalia testudinalis	Common Tortoiseshell Limpet	Animalia	Mollusca	Gastropoda		Lottiidae	Testudinalia
Ruditapes decussatus	Chequered Carpet Shell	Animalia	Mollusca	Bivalvia	Veneroida	Veneridae	Ruditapes
Similipecten similis		Animalia	Mollusca	Bivalvia	Pectinoida	Propeamussiidae	Similipecten
Onchidoris		Animalia	Mollusca	Gastropoda	Nudibranchia	Onchidorididae	Onchidoris
Rissoa		Animalia	Mollusca	Gastropoda	Littorinimorpha	Rissoidae	Rissoa
Patella (Patella)		Animalia	Mollusca	Gastropoda		Patellidae	Patella
Edmundsella pedata		Animalia	Mollusca	Gastropoda	Nudibranchia	Flabellinidae	Edmundsella
Dendronotus frondosus/europaeus/lacteus		Animalia	Mollusca	Gastropoda	Nudibranchia	Dendronotidae	Dendronotus
Littorina littorea	Common Periwinkle	Animalia	Mollusca	Gastropoda	Littorinimorpha	Littorinidae	Littorina
Tritia incrassata	Thick-lipped Dog Whelk	Animalia	Mollusca	Gastropoda	Neogastropoda	Nassariidae	Tritia
Buccinum undatum	Common whelk	Animalia	Mollusca	Gastropoda	Neogastropoda	Buccinidae	Buccinum
Pelecypoda		Animalia	Mollusca	Pelecypoda			
Margarites helicinus	Pearly Top Shell	Animalia	Mollusca	Gastropoda		Margaritidae	Margarites
Ensis		Animalia	Mollusca	Bivalvia	[unassigned] Euheterodonta	Pharidae	Ensis
Polycera quadrilineata/capitata		Animalia	Mollusca	Gastropoda	Nudibranchia	Polyceridae	Polycera
Nematoda	Nematode	Animalia	Nematoda				
Nemertea		Animalia	Nemertea				
Cerebratulus		Animalia	Nemertea	Anopla		Lineidae	Cerebratulus
Phoronis		Animalia	Phoronida				Phoronis
Phoronis muelleri		Animalia	Phoronida				Phoronis
Turbellaria	Flatworm	Animalia	Platyhelminthes	Turbellaria			
Cliona celata		Animalia	Porifera	Demospongiae	Hadromerida	Clionaidae	Cliona
Halichondria (Halichondria) panicea	Breadcrumb Sponge	Animalia	Porifera	Demospongiae	Halichondrida	Halichondriidae	Halichondria
Grantia compressa	Purse Sponge	Animalia	Porifera	Calcarea	Leucosolenida	Grantiidae	Grantia
Leucosolenia botryoides		Animalia	Porifera	Calcarea	Leucosolenida	Leucosoleniidae	Leucosolenia
Myxilla (Myxilla) incrustans		Animalia	Porifera	Demospongiae	Poecilosclerida	Myxillidae	Myxilla
Priapulus caudatus		Animalia	Priapulida			Priapulidae	Priapulus
Phascolion (Phascolion) strombus		Animalia	Sipuncula	Sipunculidea	Golfingiida	Phascolionidae	Phascolion
Golfingia (Golfingia) vulgaris		Animalia	Sipuncula	Sipunculidea	Golfingiida	Golfingiidae	Golfingia
Golfingia		Animalia	Sipuncula	Sipunculidea	Golfingiida	Golfingiidae	Golfingia
Chromophyta		Chromista	Chromophyta				
Fucus serratus	Toothed Wrack	Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Fucus
Ascophyllum nodosum	Egg wrack	Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Ascophyllum
Himanthalia elongata	Thongweed	Chromista	Ochrophyta	Phaeophyceae	Fucales	Himanthaliaceae	Himanthalia
Fucus vesiculosus	Bladder Wrack	Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Fucus
Fucus spiralis	Spiral Wrack	Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Fucus
Pelvetia canaliculata	Channelled Wrack	Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Pelvetia
Leathesia marina		Chromista	Ochrophyta	Phaeophyceae	Ectocarpales	Chordariaceae	Leathesia
Laminaria digitata	Oarweed	Chromista	Ochrophyta	Phaeophyceae	Laminariales	Laminariaceae	Laminaria
Saccharina latissima	Sugar Kelp	Chromista	Ochrophyta	Phaeophyceae	Laminariales	Laminariaceae	Saccharina
Asperococcus		Chromista	Ochrophyta	Phaeophyceae	Ectocarpales	Chordariaceae	Asperococcus
Fucus		Chromista	Ochrophyta	Phaeophyceae	Fucales	Fucaceae	Fucus
Laminaria hyperborea	Cuvie	Chromista	Ochrophyta	Phaeophyceae	Laminariales	Laminariaceae	Laminaria
Desmarestia aculeata		Chromista	Ochrophyta	Phaeophyceae	Desmarestiales	Desmarestiaceae	Desmarestia
Ectocarpaceae		Chromista	Ochrophyta	Phaeophyceae	Ectocarpales	Ectocarpaceae	
Dictyosiphon		Chromista	Ochrophyta	Phaeophyceae	Ectocarpales	Chordariaceae	Dictyosiphon
Alaria esculenta	Dabberlocks	Chromista	Ochrophyta	Phaeophyceae	Laminariales	Alariaceae	Alaria

Elachista fucicola		Chromista	Ochrophyta	Phaeophyceae	Ectocarpales	Chordariaceae	Elachista
Saccorhiza polyschides	Furbelows	Chromista	Ochrophyta	Phaeophyceae	Tilopteridales	Phyllariaceae	Saccorhiza
Laminaria	Kelp	Chromista	Ochrophyta	Phaeophyceae	Laminariales	Laminariaceae	Laminaria
Desmarestia viridis		Chromista	Ochrophyta	Phaeophyceae	Desmarestiales	Desmarestiaceae	Desmarestia
Scytosiphon lomentaria		Chromista	Ochrophyta	Phaeophyceae	Scytosiphonales	Scytosiphonaceae	Scytosiphon
Sphacelaria		Chromista	Ochrophyta	Phaeophyceae	Sphacelariales	Sphacelariaceae	Sphacelaria
Cladonia coccifera s. lat.	Scarlet-Cup Lichen	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Lecidea lithophila		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Lecidea
Parmelia omphalodes		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Parmelia
Cladonia strepsilis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Caloplaca thallincola		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Pertusaria pseudocorallina		Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Pertusariaceae	Pertusaria
Lecidea diducens		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Lecidea
Candelariella vitellina f. vitellina		Fungi	Ascomycota	Lecanoromycetes	Candelariales	Candelariaceae	Candelariella
Toninia aromatica		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Toninia
Cetraria aculeata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Cetraria
Lecanora pulicaris		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Cladonia portentosa	crotail rÃ¨in-fhÃ¨idh	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Sphaerophorus globosus		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Sphaerophoraceae	Sphaerophorus
Lecanora symmicta		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Lecanora carpinea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Bryoria fuscescens		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Bryoria
Placynthiella uliginosa		Fungi	Ascomycota	Lecanoromycetes	Baeomycetales	Trapeliaceae	Placynthiella
Herteliana gagei		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Herteliana
Cladonia uncialis subsp. biuncialis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Myriolecis dispersa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Myriolecis
Lecanora varia		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Ochrolechia frigida f. frigida		Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Ochrolechiaceae	Ochrolechia
Myriospora smaragdula		Fungi	Ascomycota	Lecanoromycetes	Acarosporales	Acarosporaceae	Myriospora
Cetraria muricata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Cetraria
Cladonia bellidiflora		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Parmelia sulcata	Netted Shield Lichen	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Parmelia
Pseudevernia furfuracea s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Pseudevernia
Cladonia arbuscula subsp. squarrosa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Caloplaca crenularia		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Caloplaca marina	Orange Sea Lichen	Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Platismatia glauca		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Platismatia
Lecanora rupicola var. rupicola	Slow-Growing Lichen	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Ionaspis lacustris		Fungi	Ascomycota	Lecanoromycetes	Hymeneliales	Hymeneliaceae	Ionaspis
Placynthium nigrum		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Placynthiaceae	Placynthium
Scoliciosporum umbrinum		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Scoliciosporaceae	Scoliciosporum
Lecidea lactea s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Lecidea
Anaptychia runcinata		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae	Anaptychia
Myriolecis albescens		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Myriolecis
Cladonia ciliata var. tenuis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Rinodina sophodes		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae	Rinodina
Verrucaria internigrescens		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Acarospora fuscata		Fungi	Ascomycota	Lecanoromycetes	Acarosporales	Acarosporaceae	Acarospora
Caloplaca holocarpa s. str.		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Cladonia gracilis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia

Melanelixia subaurifera		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Melanelixia
Cetraria islandica subsp. islandica	Iceland Moss	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Cetraria
Icmadophila ericetorum		Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Icmadophilaceae	Icmadophila
Ophioparma ventosa	Blood-Spot	Fungi	Ascomycota	Lecanoromycetes		Ophioparmaceae	Ophioparma
Lecanora poliophaea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Cladonia macilenta		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Xanthoria ucrainica		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Xanthoria
Phaeophyscia orbicularis		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae	Phaeophyscia
Porina chlorotica f. chlorotica		Fungi	Ascomycota	Lecanoromycetes	Ostropales	Porinaceae	Porina
Baeomyces rufus		Fungi	Ascomycota	Lecanoromycetes	Baeomycetales	Baeomycetaceae	Baeomyces
Aspicilia leprosescens		Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Megasporaceae	Aspicilia
Cladonia fimbriata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Ramalina cuspidata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Ramalina
Ramalina siliquosa	Sea Ivory	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Ramalina
Catillaria chalybeia var. chalybeia		Fungi	Ascomycota	Lecanoromycetes	Rhizocarpales	Catillariaceae	Catillaria
Porpidia tuberculosa		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Porpidia
Lepraria incana s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Stereocaulaceae	Lepraria
Usnea subfloridana		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Usnea
Ramalina farinacea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Ramalina
Tephromela atra var. atra	Black Shields	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Mycoblastaceae	Tephromela
Buellia disciformis		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Caliciaceae	Buellia
Lecanora polytropa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Evernia prunastri	Oak Moss	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Evernia
Fuscidea cyathoides var. cyathoides		Fungi	Ascomycota	Lecanoromycetes		Fuscideaceae	Fuscidea
Lichina confinis		Fungi	Ascomycota	Lecanoromycetes	Lichinales	Lichinaceae	Lichina
Cladonia squamosa s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Micarea lignaria		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Pilocarpaceae	Micarea
Cladonia furcata subsp. furcata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Peltigera membranacea		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Peltigeraceae	Peltigera
Xanthoria parietina	Common Orange Lichen	Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Xanthoria
Collema cristatum var. cristatum		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Collemataceae	Collema
Lecidella elaeochroma f. soralifera		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecidella
Verrucaria hochstetteri		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Tuckermannopsis chlorophylla		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Tuckermannopsis
Lecidella scabra		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecidella
Verrucaria nigrescens		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Ramalina subfarinacea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Ramalina
Cladonia floerkeana		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Physcia caesia		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae	Physcia
Opegrapha calcarea		Fungi	Ascomycota	Arthoniomycetes	Arthoniales	Roccellaceae	Opegrapha
Porina multipuncta		Fungi	Ascomycota	Lecanoromycetes	Ostropales	Porinaceae	Porina
Ochrolechia parella	Crab's Eye Lichen	Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Ochrolechiaceae	Ochrolechia
Amandinea punctata		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Caliciaceae	Amandinea
Ochrolechia androgyna		Fungi	Ascomycota	Lecanoromycetes	Pertusariales	Ochrolechiaceae	Ochrolechia
Lecanora chlarotera		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Collema crispum var. crispum		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Collemataceae	Collema
Lecidella stigmatea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecidella
Lecanora helicopis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Rhizocarpon geographicum		Fungi	Ascomycota	Lecanoromycetes	Rhizocarpales	Rhizocarpaceae	Rhizocarpon
Parmelia saxatilis s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Parmelia

Porpidia macrocarpa f. macrocarpa		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Porpidia
Arthonia phaeobaea		Fungi	Ascomycota	Arthoniomycetes	Arthoniales	Arthoniaceae	Arthonia
Placopyrenium fuscellum		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Placopyrenium
Pannaria rubiginosa		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Pannariaceae	Pannaria
Physcia tenella		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Physciaceae	Physcia
Hypogymnia physodes	Dark Crottle	Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Hypogymnia
Hydropunctaria maura	Tar Lichen	Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Hydropunctaria
Opegrapha atra		Fungi	Ascomycota	Arthoniomycetes	Arthoniales	Roccellaceae	Opegrapha
Fuscidea lygaea		Fungi	Ascomycota	Lecanoromycetes		Fuscideaceae	Fuscidea
Lecidella elaeochroma f. elaeochroma		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecidella
Cladonia cervicornis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Melanelixia fuliginosa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Melanelixia
Cladonia subcervicornis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Verrucaria muralis		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Verrucaria fusconigrescens		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Lecanora expallens		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Schaereria fuscocinerea var. fuscocinerea		Fungi	Ascomycota	Lecanoromycetes		Schaereriaceae	Schaereria
Hypogymnia tubulosa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Hypogymnia
Rhizocarpon reductum		Fungi	Ascomycota	Lecanoromycetes	Rhizocarpales	Rhizocarpaceae	Rhizocarpon
Bilimbia sabuletorum		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Bilimbia
Collema auriforme		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Collemataceae	Collema
Gyalecta jenensis var. jenensis		Fungi	Ascomycota	Lecanoromycetes	Ostropales	Gyalectaceae	Gyalecta
Cladonia verticillata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Lecanora intricata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Cladonia crispata var. cetrariiformis		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Buellia stellulata		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Caliciaceae	Buellia
Cladonia polydactyla var. polydactyla		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Cladonia pyxidata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Cladonia chlorophaea s. lat.		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Bacidia scopulicola		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	Bacidia
Usnea hirta		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Parmeliaceae	Usnea
Verrucaria striatula		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Lecanora confusa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Arthonia radiata		Fungi	Ascomycota	Arthoniomycetes	Arthoniales	Arthoniaceae	Arthonia
Caloplaca limonia		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Trapeliopsis granulosa		Fungi	Ascomycota	Lecanoromycetes	Baeomycetales	Trapeliaceae	Trapeliopsis
Lecanora campestris subsp. campestris		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Caloplaca saxicola		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Lecanora sulphurea		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Buellia aethalea		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Caliciaceae	Buellia
Lecidella asema		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecidella
Peltigera hymenina		Fungi	Ascomycota	Lecanoromycetes	Peltigerales	Peltigeraceae	Peltigera
Porpidia cinereoatra		Fungi	Ascomycota	Lecanoromycetes	Lecideales	Lecideaceae	Porpidia
Micarea lignaria var. lignaria		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Pilocarpaceae	Micarea
Caloplaca flavocitrina		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca
Lecanora conizaeoides f. conizaeoides		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
Placynthiella icmalea		Fungi	Ascomycota	Lecanoromycetes	Baeomycetales	Trapeliaceae	Placynthiella
Cladonia furcata		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Cladonia squamosa var. squamosa		Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
Caloplaca oasis		Fungi	Ascomycota	Lecanoromycetes	Teloschistales	Teloschistaceae	Caloplaca

Verrucaria		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Verrucaria mucosa		Fungi	Ascomycota	Eurotiomycetes	Verrucariales	Verrucariaceae	Verrucaria
Rhizocarpon		Fungi	Ascomycota	Lecanoromycetes	Rhizocarpales	Rhizocarpaceae	Rhizocarpon
Lichenomphalia hudsoniana		Fungi	Basidiomycota	Agaricomycetes	Agaricales	Hygrophoraceae	Lichenomphalia
Lichenomphalia umbellifera	Heath Navel	Fungi	Basidiomycota	Agaricomycetes	Agaricales	Hygrophoraceae	Lichenomphalia
Lichens		Fungi					
Pseudobryum cinclidioides	River Thyme-moss	Plantae	Bryophyta	Bryopsida	Bryales	Plagiomniaceae	Pseudobryum
Platyhypnidium riparioides	Long-beaked Water Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Platyhypnidium
Sarmentypnum exannulatum	Ringless Hook-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Calliergonaceae	Sarmentypnum
Brachythecium rutabulum	Rough-stalked Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Brachythecium
Fontinalis antipyretica	Greater Water-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Fontinalaceae	Fontinalis
Campylopus flexuosus	Rusty Swan-neck Moss	Plantae	Bryophyta	Bryopsida	Dicranales	Leucobryaceae	Campylopus
Hypnum jutlandicum	Heath Plait-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hypnaceae	Hypnum
Rhytidiadelphus squarrosus	Springy Turf-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hylocomiaceae	Rhytidiadelphus
Didymodon insulanus	Cylindric Beard-moss	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Didymodon
Entosthodon obtusus	Blunt Cord-moss	Plantae	Bryophyta	Bryopsida	Funariales	Funariaceae	Entosthodon
Drepanocladus revolvens		Plantae	Bryophyta	Bryopsida	Hypnales	Amblystegiaceae	Drepanocladus
Thuidium tamariscinum	Common Tamarisk-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Thuidiaceae	Thuidium
Racomitrium lanuginosum	Woolly Fringe-moss	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Racomitrium
Sphagnum denticulatum	Cow-horn Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Polytrichum commune	Common Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
Calliergonella cuspidata	Pointed Spear-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hypnaceae	Calliergonella
Sphagnum subnitens	Lustrous Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Isothecium myosuroides	Slender Mouse-tail Moss	Plantae	Bryophyta	Bryopsida	Hypnales	Lembophyllaceae	Isothecium
Bryum capillare	Capillary Thread-moss	Plantae	Bryophyta	Bryopsida	Bryales	Bryaceae	Bryum
Grimmia pulvinata	Grey-cushioned Grimmia	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Grimmia
Dichodontium palustre	Marsh Forklet-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Rhabdoweisiaceae	Dichodontium
Rhytidiadelphus loreus	Little Shaggy-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hylocomiaceae	Rhytidiadelphus
Pohlia wahlenbergii	Pale Glaucous Thread-moss	Plantae	Bryophyta	Bryopsida	Bryales	Mielichhoferiaceae	Pohlia
Sphagnum tenellum	Soft Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Campylopus introflexus	Heath Star Moss	Plantae	Bryophyta	Bryopsida	Dicranales	Leucobryaceae	Campylopus
Dicranella varia	Variable Forklet-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Dicranaceae	Dicranella
Plagiomnium undulatum	Hart's-tongue Thyme-moss	Plantae	Bryophyta	Bryopsida	Bryales	Plagiomniaceae	Plagiomnium
Dicranella heteromalla	Silky Forklet-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Dicranaceae	Dicranella
Funaria hygrometrica	Common Cord-moss	Plantae	Bryophyta	Bryopsida	Funariales	Funariaceae	Funaria
Pohlia nutans	Nodding Thread-moss	Plantae	Bryophyta	Bryopsida	Bryales	Mielichhoferiaceae	Pohlia
Campylopus brevipilus	Compact Swan-neck Moss	Plantae	Bryophyta	Bryopsida	Dicranales	Leucobryaceae	Campylopus
Sphagnum fimbriatum	Fringed Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Racomitrium canescens		Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Racomitrium
Homalothecium sericeum	Silky Wall Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Homalothecium
Calliergon cordifolium	Heart-leaved Spear-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Calliergonaceae	Calliergon
Bryum pallens	Pale Thread-moss	Plantae	Bryophyta	Bryopsida	Bryales	Bryaceae	Bryum
Philonotis fontana	Fountain Apple-moss	Plantae	Bryophyta	Bryopsida	Bryales	Bartramiaceae	Philonotis
Bartramia ithyphylla	Straight-leaved Apple-moss	Plantae	Bryophyta	Bryopsida	Bryales	Bartramiaceae	Bartramia
Hypnum cupressiforme	Cypress-leaved Plait-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hypnaceae	Hypnum
Didymodon fallax	Fallacious Beard-moss	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Didymodon
Polytrichastrum alpinum	Alpine Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichastrum
Pogonatum urnigerum	Urn Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Pogonatum
Schistidium strictum	Upright Brown Grimmia	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Schistidium
Tortula muralis	Wall Screw-moss	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Tortula

Sphagnum magellanicum	Magellanic Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Dicranum majus	Greater Fork-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Dicranaceae	Dicranum
Blindia acuta	Sharp-leaved Blindia	Plantae	Bryophyta	Bryopsida	Grimmiales	Seligeriaceae	Blindia
Sphagnum cuspidatum	Feathery Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Plagiothecium undulatum	Waved Silk-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Plagiotheciaceae	Plagiothecium
Hylocomium splendens	Glittering Wood-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hylocomiaceae	Hylocomium
Racomitrium aciculare	Yellow Fringe-moss	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Racomitrium
Polytrichum piliferum	Bristly Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
Pleurozium schreberi	Red-stemmed Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Hylocomiaceae	Pleurozium
Entosthodon attenuatus	Thin Cord-moss	Plantae	Bryophyta	Bryopsida	Funariales	Funariaceae	Entosthodon
Sphagnum palustre	Blunt-leaved Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Mnium hornum	Swan's-neck Thyme-moss	Plantae	Bryophyta	Bryopsida	Bryales	Mniaceae	Mnium
Aulacomnium palustre	Bog Groove-moss	Plantae	Bryophyta	Bryopsida	Bryales	Aulacomniaceae	Aulacomnium
Racomitrium fasciculare	Green Mountain Fringe-moss	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Racomitrium
Pogonatum aloides	Aloe Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Pogonatum
Dicranum scoparium	Broom Fork-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Dicranaceae	Dicranum
Rhizomnium punctatum	Dotted Thyme-moss	Plantae	Bryophyta	Bryopsida	Bryales	Cinclidiaceae	Rhizomnium
Polytrichum juniperinum	Juniper Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
Straminergon stramineum	Straw Spear-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Calliergonaceae	Straminergon
Kindbergia praelonga	Common Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Kindbergia
Sphagnum capillifolium	Red Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Sphagnum papillosum	Papillose Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Dichodontium pellucidum		Plantae	Bryophyta	Bryopsida	Dicranales	Rhabdoweisiaceae	Dichodontium
Atrichum undulatum	Common Smoothcap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Atrichum
Isothecium myosuroides var. brachythecioides		Plantae	Bryophyta	Bryopsida	Hypnales	Lembophyllaceae	Isothecium
Campylium stellatum		Plantae	Bryophyta	Bryopsida	Hypnales	Amblystegiaceae	Campylium
Schistidium maritimum	Seaside Grimmia	Plantae	Bryophyta	Bryopsida	Grimmiales	Grimmiaceae	Schistidium
Polytrichum strictum	Strict Haircap	Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
Sphagnum squarrosum	Spiky Bog-moss	Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Ulota phyllantha	Frizzled Pincushion	Plantae	Bryophyta	Bryopsida	Orthotrichales	Orthotrichaceae	Ulota
Didymodon rigidulus	Rigid Beard-moss	Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Didymodon
Bryum dichotomum		Plantae	Bryophyta	Bryopsida	Bryales	Bryaceae	Bryum
Dicranella rufescens	Rufous Forklet-moss	Plantae	Bryophyta	Bryopsida	Dicranales	Dicranaceae	Dicranella
Plagiothecium succulentum	Juicy Silk-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Plagiotheciaceae	Plagiothecium
Sphagnum recurvum		Plantae	Bryophyta	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
Brachythecium rivulare	River Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Brachythecium
Ceratodon purpureus	Redshank	Plantae	Bryophyta	Bryopsida	Dicranales	Ditrichaceae	Ceratodon
Ditrichum heteromallum	Curve-leaved Ditrichum	Plantae	Bryophyta	Bryopsida	Dicranales	Ditrichaceae	Ditrichum
Orthotrichum cupulatum	Hooded Bristle-moss	Plantae	Bryophyta	Bryopsida	Orthotrichales	Orthotrichaceae	Orthotrichum
Sciuro-hypnum plumosum	Rusty Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Sciuro-hypnum
Barbula convoluta		Plantae	Bryophyta	Bryopsida	Pottiales	Pottiaceae	Barbula
Orthotrichum anomalum	Anomalous Bristle-moss	Plantae	Bryophyta	Bryopsida	Orthotrichales	Orthotrichaceae	Orthotrichum
Pseudoscleropodium purum	Neat Feather-moss	Plantae	Bryophyta	Bryopsida	Hypnales	Brachytheciaceae	Pseudoscleropodium
Polytrichum commune var. commune		Plantae	Bryophyta	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
Cladophora		Plantae	Chlorophyta	Ulvophyceae	Cladophorales	Cladophoraceae	Cladophora
Enteromorpha		Plantae	Chlorophyta	Ulvophyceae	Ulvales	Ulvaceae	Enteromorpha
Ulva fenestrata	Sea Lettuce	Plantae	Chlorophyta	Ulvophyceae	Ulvales	Ulvaceae	Ulva
Ulva intestinalis	Gutweed	Plantae	Chlorophyta	Ulvophyceae	Ulvales	Ulvaceae	Ulva
Ulva	Green Laver	Plantae	Chlorophyta	Ulvophyceae	Ulvales	Ulvaceae	Ulva
Chaetomorpha		Plantae	Chlorophyta	Ulvophyceae	Cladophorales	Cladophoraceae	Chaetomorpha

Bryopsis plumosa	Hen Pen	Plantae	Chlorophyta	Ulvophyceae	Bryopsidales	Bryopsidaceae	Bryopsis
Mylia anomala	Anomalous Flapwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Myliaceae	Mylia
Pellia neesiana	Nees' Pellia	Plantae	Marchantiophyta	Jungermanniopsida	Pelliales	Pelliaceae	Pellia
Mylia taylorii	Taylor's Flapwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Myliaceae	Mylia
Chiloscyphus pallescens	St Winifrid's Other Moss	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Lophocoleaceae	Chiloscyphus
Blasia pusilla	Common Kettlewort	Plantae	Marchantiophyta	Marchantiopsida	Blasiales	Blasiaceae	Blasia
Lophozia incisa	Jagged Notchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Lophozia
Gymnocolea inflata	Inflated Notchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Gymnocolea
Aneura pinguis	Greasewort	Plantae	Marchantiophyta	Jungermanniopsida	Metzgeriales	Aneuraceae	Aneura
Odontoschisma sphagni	Bog-moss Flapwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Cephaloziaceae	Odontoschisma
Lophocolea bidentata	Bifid Crestwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Lophocoleaceae	Lophocolea
Calypogeia muelleriana	Mueller's Pouchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Calypogeiaceae	Calypogeia
Tritomaria exsectiformis	Larger Cut Notchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Tritomaria
Riccardia palmata	Palmate Germanderwort	Plantae	Marchantiophyta	Jungermanniopsida	Metzgeriales	Aneuraceae	Riccardia
Lophozia ventricosa	Tumid Notchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Lophozia
Scapania undulata	Water Earwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Scapania
Frullania tamarisci	Tamarisk Scalewort	Plantae	Marchantiophyta	Jungermanniopsida	Porellales	Frullaniaceae	Frullania
Lepidozia cupressina	Rock Fingerwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Lepidoziaceae	Lepidozia
Solenostoma gracillimum	Crenulated Flapwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Jungermanniaceae	Solenostoma
Kurzia sylvatica	Wood Fingerwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Lepidoziaceae	Kurzia
Cephalozia bicuspidata	Two-horned Pincerwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Cephaloziaceae	Cephalozia
Nardia scalaris	Ladder Flapwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Jungermanniaceae	Nardia
Pellia epiphylla	Overleaf Pellia	Plantae	Marchantiophyta	Jungermanniopsida	Pelliales	Pelliaceae	Pellia
Plagiochila porelloides	Lesser Featherwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Plagiochilaceae	Plagiochila
Riccardia latifrons	Bog Germanderwort	Plantae	Marchantiophyta	Jungermanniopsida	Metzgeriales	Aneuraceae	Riccardia
Diplophyllum albicans	White Earwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Diplophyllum
Calypogeia arguta	Notched Pouchwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Calypogeiaceae	Calypogeia
Nowellia curvifolia	Wood-rust	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Cephaloziaceae	Nowellia
Cephalozia leucantha	Pale Pincerwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Cephaloziaceae	Cephalozia
Scapania gracilis	Western Earwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Scapania
Chiloscyphus polyanthos		Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Lophocoleaceae	Chiloscyphus
Riccardia chamedryfolia	Jagged Germanderwort	Plantae	Marchantiophyta	Jungermanniopsida	Metzgeriales	Aneuraceae	Riccardia
Marsupella emarginata var. emarginata		Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Gymnomitriaceae	Marsupella
Barbilophozia floerkei	Common Pawwort	Plantae	Marchantiophyta	Jungermanniopsida	Jungermanniales	Scapaniaceae	Barbilophozia
Pleurozia purpurea	Purple Spoonwort	Plantae	Marchantiophyta	Jungermanniopsida	Pleuroziales	Pleuroziaceae	Pleurozia
Dryopteris dilatata	Broad Buckler-fern	Plantae	Pteridophyta	Polypodiopsida	Polypodiales	Dryopteridaceae	Dryopteris
Porphyra		Plantae	Rhodophyta	Bangiophyceae	Bangiales	Bangiaceae	Porphyra
Dumontia contorta		Plantae	Rhodophyta	Florideophyceae	Gigartinales	Dumontiaceae	Dumontia
Lithothamnion		Plantae	Rhodophyta	Florideophyceae	Corallinales	Hapalidiaceae	Lithothamnion
Corallina officinalis	Coral Weed	Plantae	Rhodophyta	Florideophyceae	Corallinales	Corallinaceae	Corallina
Osmundea pinnatifida	Pepper Dulse	Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Osmundea
Chondrus crispus	Carrageen	Plantae	Rhodophyta	Florideophyceae	Gigartinales	Gigartinaceae	Chondrus
Mastocarpus stellatus	False Irish Moss	Plantae	Rhodophyta	Florideophyceae	Gigartinales	Phyllophoraceae	Mastocarpus
Polysiphonia		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Polysiphonia
Gelidium		Plantae	Rhodophyta	Florideophyceae	Gelidiales	Gelidiaceae	Gelidium
Nitophyllum punctatum		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Delesseriaceae	Nitophyllum
Lomentaria articulata		Plantae	Rhodophyta	Florideophyceae	Rhodymeniales	Lomentariaceae	Lomentaria
Corallinaceae	Coralline crusts	Plantae	Rhodophyta	Florideophyceae	Corallinales	Corallinaceae	
Hildenbrandia		Plantae	Rhodophyta	Florideophyceae	Hildenbrandiales	Hildenbrandiaceae	Hildenbrandia
Rhodophyta	Dark red crusts	Plantae	Rhodophyta				

Callithamnion	Callithamnion spp (spongy)	Plantae	Rhodophyta	Florideophyceae	Ceramiales	Callithamniaceae	Callithamnion
Phycodrys rubens		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Delesseriaceae	Phycodrys
Membranoptera alata		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Delesseriaceae	Membranoptera
Audouinella		Plantae	Rhodophyta	Florideophyceae		Acrochaetiaceae	Audouinella
Vertebrata nigra		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Vertebrata
Osmundea hybrida		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Osmundea
Polysiphonia elongata		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Polysiphonia
Callophyllis laciniata		Plantae	Rhodophyta	Florideophyceae	Gigartinales	Kallymeniaceae	Callophyllis
Ceramium		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Ceramiaceae	Ceramium
Plocamium cartilagineum		Plantae	Rhodophyta	Florideophyceae	Plocamiales	Plocamiaceae	Plocamium
Ptilota gunneri		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Wrangeliaceae	Ptilota
Halarachnion ligulatum		Plantae	Rhodophyta	Florideophyceae	Gigartinales	Furcellariaceae	Halarachnion
Bonnemaisonia hamifera	Bonnemaison's Hook Weed	Plantae	Rhodophyta	Florideophyceae	Bonnemaisoniales	Bonnemaisoniaceae	Bonnemaisonia
Cryptopleura ramosa		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Delesseriaceae	Cryptopleura
Kallymenia reniformis		Plantae	Rhodophyta	Florideophyceae	Gigartinales	Kallymeniaceae	Kallymenia
Polysiphonia stricta		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Polysiphonia
Hypoglossum hypoglossoides		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Delesseriaceae	Hypoglossum
Gelidium spinosum		Plantae	Rhodophyta	Florideophyceae	Gelidiales	Gelidiaceae	Gelidium
Ceramium virgatum		Plantae	Rhodophyta	Florideophyceae	Ceramiales	Ceramiaceae	Ceramium
Luzula multiflora	Heath Wood-rush	Plantae	Tracheophyta	Magnoliopsida	Poales	Juncaceae	Luzula
Agrostis stolonifera	Creeping Bent	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Agrostis
Pinus contorta	Lodgepole Pine	Plantae	Tracheophyta	Pinopsida	Pinales	Pinaceae	Pinus
Rumex acetosa	Common Sorrel	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Polygonaceae	Rumex
Poa annua	Annual Meadow-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Poa
Cerastium fontanum	Common Mouse-ear	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Caryophyllaceae	Cerastium
Crocosmia pottsii x aurea = C. x crocosmiiflora	Montbretia	Plantae	Tracheophyta	Magnoliopsida	Asparagales	Iridaceae	Crocosmia
Plantago coronopus	Buck's-horn Plantain	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Plantaginaceae	Plantago
Trifolium repens	White Clover	Plantae	Tracheophyta	Magnoliopsida	Fabales	Fabaceae	Trifolium
Prunella vulgaris	Selfheal	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Lamiaceae	Prunella
Ribes uva-crispa	Gooseberry	Plantae	Tracheophyta	Magnoliopsida	Saxifragales	Grossulariaceae	Ribes
Potentilla erecta	Tormentil	Plantae	Tracheophyta	Magnoliopsida	Rosales	Rosaceae	Potentilla
Tripleurospermum maritimum	Sea Mayweed	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Tripleurospermum
Heracleum sphondylium	Hogweed	Plantae	Tracheophyta	Magnoliopsida	Apiales	Apiaceae	Heracleum
Ranunculus acris	Meadow Buttercup	Plantae	Tracheophyta	Magnoliopsida	Ranunculales	Ranunculaceae	Ranunculus
Conopodium majus	Pignut	Plantae	Tracheophyta	Magnoliopsida	Apiales	Apiaceae	Conopodium
Epilobium palustre	Marsh Willowherb	Plantae	Tracheophyta	Magnoliopsida	Myrtales	Onagraceae	Epilobium
Lonicera periclymenum	Honeysuckle	Plantae	Tracheophyta	Magnoliopsida	Dipsacales	Caprifoliaceae	Lonicera
Phalaris arundinacea var. picta		Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Phalaris
Jacobaea		Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Jacobaea
Juncus effusus	Soft-rush	Plantae	Tracheophyta	Magnoliopsida	Poales	Juncaceae	Juncus
Poa humilis	Spreading Meadow-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Poa
Stellaria media	Common Chickweed	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Caryophyllaceae	Stellaria
Festuca rubra	Red Fescue	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Festuca
Hyacinthoides non-scripta x hispanica = H. x massartiana	Bluebell	Plantae	Tracheophyta	Magnoliopsida	Asparagales	Asparagaceae	Hyacinthoides
Juncus articulatus	Jointed Rush	Plantae	Tracheophyta	Magnoliopsida	Poales	Juncaceae	Juncus
Ranunculus repens	Creeping Buttercup	Plantae	Tracheophyta	Magnoliopsida	Ranunculales	Ranunculaceae	Ranunculus
Cotula squalida	Leptinella	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Cotula
Lolium perenne	Perennial Rye-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Lolium
Silene dioica	Red Campion	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Caryophyllaceae	Silene
Holcus lanatus	Yorkshire-fog	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Holcus

Aira praecox	Early Hair-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Aira
Poa trivialis	Rough Meadow-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Poa
Myosotis discolor	Changing Forget-me-not	Plantae	Tracheophyta	Magnoliopsida		Boraginaceae	Myosotis
Plantago major	Greater Plantain	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Plantaginaceae	Plantago
Cirsium vulgare	Spear Thistle	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Cirsium
Digitalis purpurea	Foxglove	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Plantaginaceae	Digitalis
Sagina procumbens	Procumbent Pearlwort	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Caryophyllaceae	Sagina
Plantago maritima	Sea Plantain	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Plantaginaceae	Plantago
Cirsium palustre	Marsh Thistle	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Cirsium
Meconopsis cambrica	Welsh Poppy	Plantae	Tracheophyta	Magnoliopsida	Ranunculales	Papaveraceae	Meconopsis
Cochlearia officinalis	Common Scurvygrass	Plantae	Tracheophyta	Magnoliopsida	Brassicales	Brassicaceae	Cochlearia
Arrhenatherum elatius	False Oat-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Arrhenatherum
Fragaria ananassa	Garden Strawberry	Plantae	Tracheophyta	Magnoliopsida	Rosales	Rosaceae	Fragaria
Agrostis capillaris	Common Bent	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Agrostis
Atriplex prostrata	Spear-leaved Orache	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Amaranthaceae	Atriplex
Salix viminalis x cinerea = S. x holosericea	Silky-leaved Osier	Plantae	Tracheophyta	Magnoliopsida	Malpighiales	Salicaceae	Salix
Alnus glutinosa	Alder	Plantae	Tracheophyta	Magnoliopsida	Fagales	Betulaceae	Alnus
Iris pseudacorus	Yellow Iris	Plantae	Tracheophyta	Magnoliopsida	Asparagales	Iridaceae	Iris
Salix euxina x alba = S. x fragilis	Crack-willow	Plantae	Tracheophyta	Magnoliopsida	Malpighiales	Salicaceae	Salix
Sambucus nigra	Elder	Plantae	Tracheophyta	Magnoliopsida	Dipsacales	Adoxaceae	Sambucus
Elytrigia repens	Common Couch	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Elytrigia
Solanum tuberosum	Potato	Plantae	Tracheophyta	Magnoliopsida	Solanales	Solanaceae	Solanum
Angelica sylvestris	Wild Angelica	Plantae	Tracheophyta	Magnoliopsida	Apiales	Apiaceae	Angelica
Hypochaeris radicata	Cat's-ear	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Hypochaeris
Fraxinus excelsior	Ash	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Oleaceae	Fraxinus
Rumex crispus subsp. littoreus		Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Polygonaceae	Rumex
Cynosurus cristatus	Crested Dog's-tail	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Cynosurus
Mentha suaveolens x longifolia = M. x rotundifolia	False Apple-mint	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Lamiaceae	Mentha
Picea sitchensis	Sitka Spruce	Plantae	Tracheophyta	Pinopsida	Pinales	Pinaceae	Picea
Plantago lanceolata	Ribwort Plantain	Plantae	Tracheophyta	Magnoliopsida	Lamiales	Plantaginaceae	Plantago
Anthoxanthum odoratum	Sweet Vernal-grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Anthoxanthum
Montia fontana	Blinks	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Montiaceae	Montia
Cardamine pratensis	Cuckooflower	Plantae	Tracheophyta	Magnoliopsida	Brassicales	Brassicaceae	Cardamine
Juncus squarrosus	Heath Rush	Plantae	Tracheophyta	Magnoliopsida	Poales	Juncaceae	Juncus
Bellis perennis	Daisy	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Bellis
Poaceae	Grass	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	
Galium aparine	Cleavers	Plantae	Tracheophyta	Magnoliopsida	Gentianales	Rubiaceae	Galium
Stellaria alsine	Bog Stitchwort	Plantae	Tracheophyta	Magnoliopsida	Caryophyllales	Caryophyllaceae	Stellaria
Dactylis glomerata	Cock's-foot	Plantae	Tracheophyta	Magnoliopsida	Poales	Poaceae	Dactylis
Galium saxatile	Heath Bedstraw	Plantae	Tracheophyta	Magnoliopsida	Gentianales	Rubiaceae	Galium
Urtica dioica	Common Nettle	Plantae	Tracheophyta	Magnoliopsida	Rosales	Urticaceae	Urtica
Chlorophycota	Chlorophycota indet (crusts)	Plantae					

APPENDIX C2
HABITAT SURVEY REPORT

Habitat Survey Report for Neshion Energy Park

Alba Ecology Ltd.

February 2023

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Summary

Alba Ecology Ltd. was commissioned by Neshion Ltd to conduct a Phase 1 Habitat and National Vegetation Classification (NVC) survey, to report on potential groundwater dependent terrestrial ecosystems (GWDTE) and to consider the condition of the peatland habitat using the Peatland Condition Assessment (PCA) for Neshion, a proposed energy park site in Shetland.

Field survey work was undertaken in July 2022 and included a Phase 1 Habitat Survey, an NVC survey and assessment of potential GWDTE. As much of the habitat was peatland, a Peatland Condition Assessment (PCA) was also undertaken as part of the survey.

The Study Area was characterised by blanket bog and dry modified bog with the most common NVC community mapped across the Study Area being M17b. Less frequently recorded habitats including dry heath, wet heath, acid grassland, coastal grassland and marshy grassland. There were multiple flushes across the Study Area. These habitats and vegetation community types are typical for Shetland.

The condition of the blanket bog was described using standard PCA terminology (which is capitalised within the text). The condition of the peatland habitat was very variable across the Study Area, and was on a continuum from very wet, high quality blanket bog in Near-Natural condition to Modified and Drained bog. There was widepread degraded areas that were Actively Eroding.

Some of the habitats in the Study Area were defined as wetland habitat and potential GWDTE. The NVC communities M6 and M29 are considered to be potentially highly groundwater dependent.

When assessing the potential impact of the Proposed Development, the presence and importance of the habitats present should be considered.

Introduction

Alba Ecology Ltd. was commissioned by Neshion Ltd to conduct a Phase 1 Habitat and National Vegetation Classification (NVC) survey, to report on potential groundwater dependent terrestrial ecosystems (GWDTE) and to consider the condition of the peatland habitat using the Peatland Condition Assessment (PCA) for Neshion, a proposed energy park site in Shetland. The Application Boundary is to the east of Sullom Voe centred on Crooksetter Hill, ca. HU 42 76.

This document reports the findings of the Phase 1 Habitat survey, NVC survey, PCA and potential GWDTE assessment undertaken by Alba Ecology Ltd. in July 2022.

Aims and Objectives

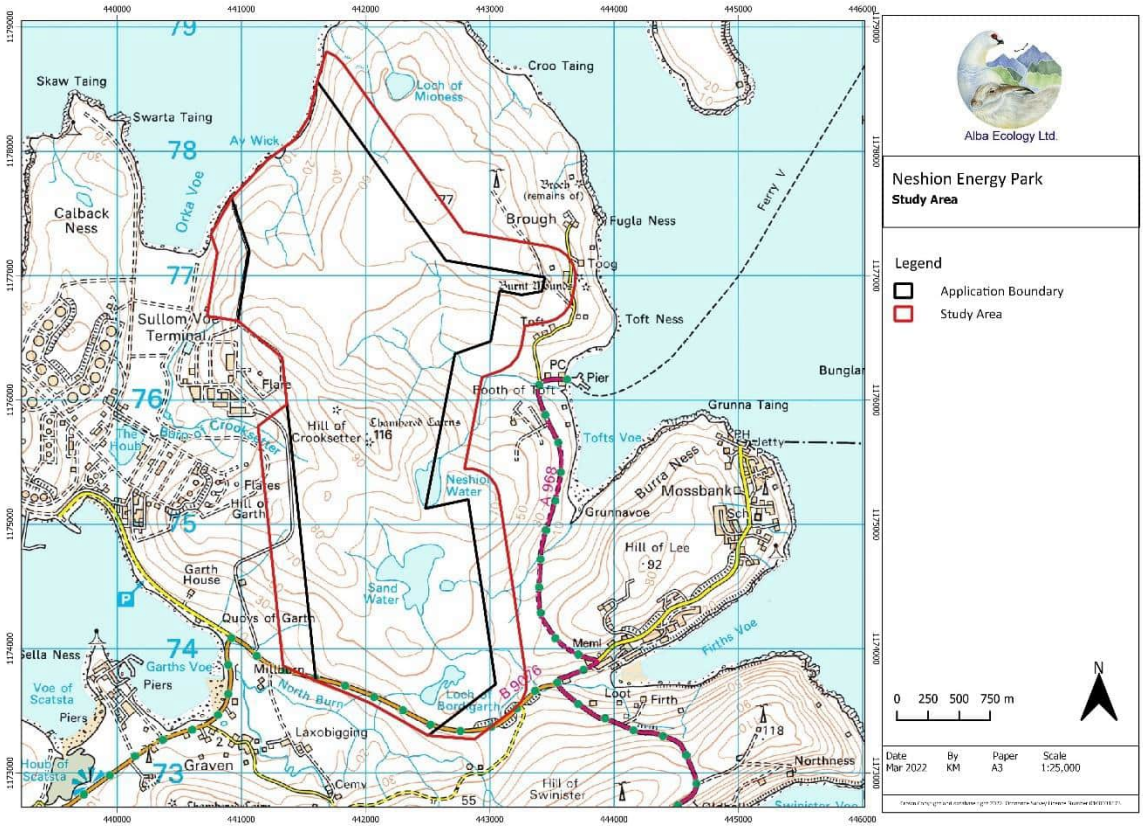
The objectives for this survey report are:

- To identify, map and describe Phase 1 Habitats and NVC communities in the Study Area;
- To consider the condition of the peatland habitats using the PCA; and
- To identify if the wetland habitats are potential GWDTEs.

Study Area

What constitutes the Study Area is an important consideration for habitat and vegetation surveys. A 250m buffer is usually required around all proposed development infrastructure (with >1m evacuation) to comply with SEPA guidance (2017a). Therefore, for the purposes of this Phase 1 Habitat, NVC, PCA and GWDTE survey the Study Area included the Application Boundary plus a 250m buffer except where there were clear areas that could not be surveyed (e.g. Sullom Voe Terminal) or there were clear boundaries (such as roads watercourses and the sea). The total Study Area was ca. 9.2km^2 (Figure 1).

Figure 1: Study Area



Background Information

Soil and geological information can provide insight into the vegetation expected in the Study Area and can inform decisions regarding GWDTE. Therefore, the British Geological Society's (BGS) hydrogeological and geological mapping and the Carbon and Peatland (2016) Map has been consulted to inform this survey report and are presented in Table 1.

The predicted Carbon and Peatland Map (2016) for the Study Area is shown in Figure 2. It predicts that much of the Search Area is Class 1 peatlands, with other areas mostly predicted to be Class 4 or Class 5. Class 1 peatland is defined as "*nationally important carbon-rich soils, deep peat and priority peatland habitat and areas likely to be of high conservation value*". Class 4 is defined as "*area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils*". Class 5 is defined as "*soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat*." It should be noted that the Carbon and Peatland Map is a high-level predictive planning tool which provides an indication of the likely presence of peat on each individually mapped area, at a coarse scale. The map is not a definitive account of where important carbon rich soils, deep peat and priority peatland habitats exist.

Figure 2: Extract of the predicted Carbon and Peatland Map (2016) for the Study Area

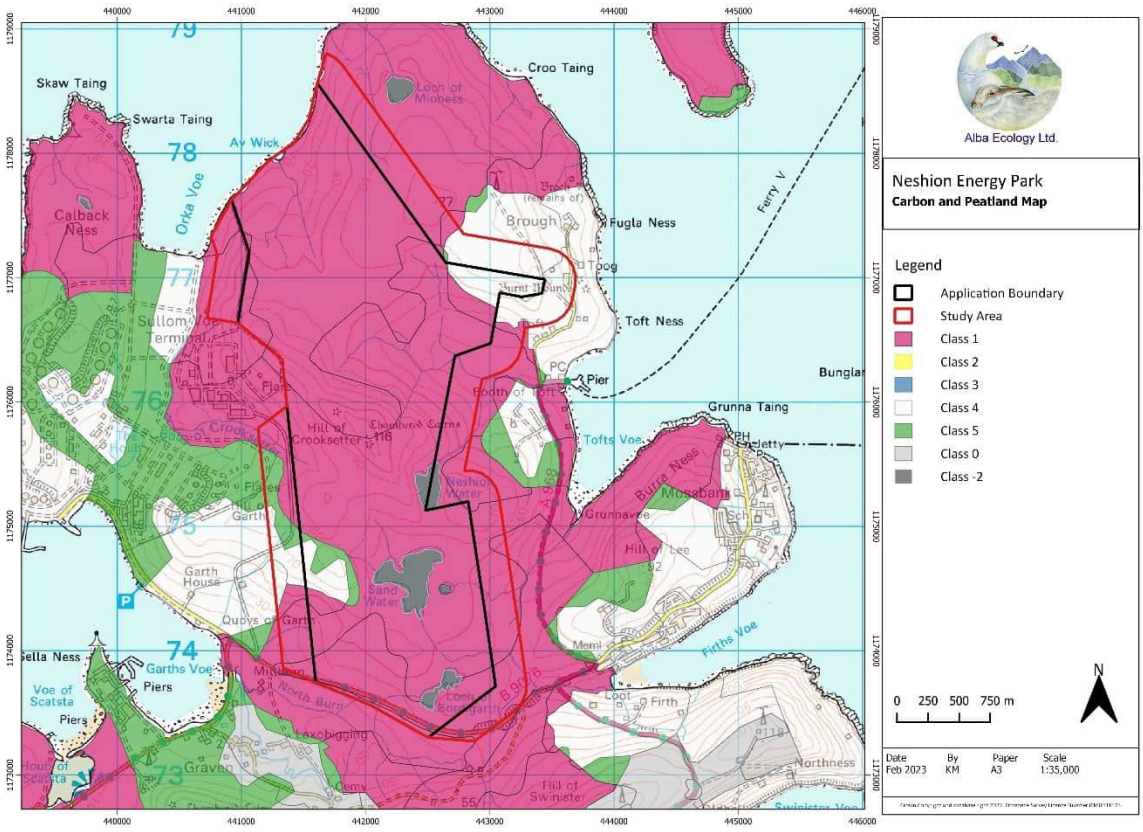


Table 1 provides an overview of the geological information recorded for the Search Area.

Source	Details
Carbon and Peatland map	Predicted mixture of: • Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value. • Class 3 - Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat. • Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils. • Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat. • Class 0 - Mineral soil - Peatland habitats are not typically found on such soils. • Class -2 - Non-soil (e.g. loch, built up area, rock and scree).
BGS – superficial deposits	The majority of the superficial deposits in the Study Area were described as: • Peat. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period. • Glacial Deposits - diamicton. Sedimentary superficial deposit formed between 2.588 million and 11.8 thousand years ago during the Quaternary period.

Source	Details
	• Marine Beach Deposits - gravel, sand and silt. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period.
BGS – bedrock	The bedrock found in the Study Area are described as: North and west of the Search Area: • Yell Sound Psammite Formation - psammite and pelite. Metamorphic bedrock formed between 1000 and 541 million years ago between the Tonian and Ediacaran periods. West of Search Area: • Yell Sound Psammite Formation - psammite, gneissose. Metamorphic bedrock formed between 1000 and 541 million years ago between the Tonian and Ediacaran periods. South of Search Area: • Graven Complex - granodiorite. Igneous bedrock formed between 419.2 and 393.3 million years ago during the Devonian period.
BGS - hydrogeological maps	Low productivity aquifer with small amounts of groundwater in near surface weathered zone and secondary fractures.

Table 1: Summary descriptions of the soils, bedrock, and hydrogeology for the Site (BGS, 2023a; BGS, 2023b; Scotland's Soils, 2016).

Survey Methods

The habitat and vegetation surveys were led by highly experienced habitats surveyor Dr Kate Massey (MCIEEM) of Alba Ecology Ltd., with Dr Fergus Massey of Alba Ecology in July 2022 in good weather conditions, suitable for conducting habitat surveys.

The surveys were conducted using 1:50,000 Ordnance Survey maps and aerial photographs with a resolution of 0.25m purchased from emapsite. The Phase 1 Habitat survey and the NVC survey were conducted at a scale of 1:5,000 using the Ordnance Survey maps and aerial photographs.

Phase 1 Habitat Survey

Phase 1 Habitat surveys are a standard national classification scheme of broad habitat types and are based on plant species presence and some abiotic indicators such as apparent peat depth. The vegetation was described and mapped following the methods described in the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat surveys (JNCC, 2010).

National Vegetation Classification (NVC) Survey

The NVC is a detailed survey of plant communities using plant species presence and abundance. The vegetation was classified and mapped following the methods described in the JNCC National Vegetation Classification User's Handbook (JNCC, 2006). Reference was

made to NVC field guides (e.g. Hall *et al.*, 2004; Elkington *et al.*, 2001; Cooper, 1997) the published NVC communities and the floristic tables (e.g. Rodwell, 1991a; Rodwell, 1991b; Rodwell, 1992; Rodwell, 1995; Rodwell, 2001; Averis *et al.*, 2004).

The minimum size of vegetation mapped was approximately 20m × 20m. Smaller stands were described as target notes, located by GPS. Target notes were also made of any unusual features, rare species, management activities or other points of particular interest.

Groundwater Dependant Terrestrial Ecosystems (GWDTE)

Where wetlands were identified, following the Functional Wetland Typology (SNIFFER, 2009a and 2009b) and Botanæco GWDTE guides (Botanæco, 2021), an assessment was made as to whether they were likely to be potential GWDTEs as defined in SEPA Guidance Notes (SEPA, 2017a; SEPA, 2017b).

Peatland Condition Assessment (PCA)

As much of the site was on peatland the PCA was consulted during the surveys and consideration given to the condition of the peatland based on this guide (Peatland Action, 2016).

PCA bases the condition of blanket bog on indicators such as bog-moss cover, extent of bare peat and evidence of grazing and burning (Peatland Action, 2016). The PCA recognises four categories of peatland condition:

1. Near-Natural - peat forming bog-mosses dominant, with no recent fires, little or no grazing pressure and little or no bare peat, heather is not dominant.
2. Modified – Bare peat is in small patches, fires may be recent, grazing impacts are evident, bog-mosses are absent or rare, extensive cover of heather or purple moor-grass.
3. Drained – within 30m either side of an artificial drain or a revegetated hagg or gully system.
4. Actively Eroding – actively eroding hagg/gully system, extensive continuous bare peat surfaces.

At least one category from the PCA was assigned to each mapped peatland area.

The PCA Support Tool also gives descriptions of peatlands as being ‘good’, ‘intermediate’ or ‘bad’ condition (Glenk *et al*, 2017). The criteria for these are shown in Table 2.

Signs	Good	Intermediate	Bad
Water	Plenty of water, visible on the surface.	Surface water is rarely visible.	Deep gullies have formed from wind and water erosion.
Vegetation	Small grasses, bog-mosses (*Sphagnum spp*.)	Taller plants, such as cottongrasses (*Eriophorum spp*.) and heather.	Rarely any plants grow on the areas that are exposed. Patches of grasses or heather

Signs	Good	Intermediate	Bad
	common and very wet.		are still found on 'islands' in between exposed bare peat.
Bare peat	Little to no bare peat patches.	Bare peat patches are occasional, burning may occur.	Bare peat areas will continue to expand, leaving less plant cover as protection on the surface. Peat will continue to be lost until the solid rock is exposed.
Water quality	Water flowing from good quality peatland is clear.	Water flowing from peatland likely to be slightly brown, especially after heavy rainfall.	Bad water quality, it can be dark brown from the peat content.
Wildlife	Good for wildlife.	Wildlife less abundant than in good condition.	Home to little wildlife.
Resultant activity level	Active.	Stopped growing, inactive.	Inactive.

Table 2: Peatland Condition Assessment Support Tool categories of good, intermediate and bad peatland (Glenk et al*, 2017).*

Nomenclature

Common species names only are given in this report. Nomenclature follows Streeter (2016) for higher plant species, and Atherton *et al*. (2010) for bryophyte species. Plant groups comprising many micro-species (such as dandelions *Taraxacum*) are treated as aggregates. These micro-species are not important for defining habitats or communities.

Limitations

Standard sampling methods were followed, and any biases or limitations associated with these standard methods could potentially affect the results collected. Furthermore, while every effort was made to provide a full assessment and comprehensive description of the Study Area, it is unlikely that one survey can achieve full characterisation due to temporal variations. Typical limitations to Phase 1 Habitat, NVC, PCA and GWDTE surveys include:

- Maps are only indicative of the boundaries as there was often no clear boundary between vegetation types, there being instead a gradual change.
- Some Phase 1 Habitats and NVC communities are made up of a similar assemblage of species, and there can be transitional stages between two community types.
- The fit of NVC communities to the published communities is often imperfect and the closest approximation of the communities are described. Surveying in Scotland has the added limitation that many of the NVC community descriptions were derived in England and so the published descriptions may not match well with those found for example in the Study Area.
- Phase 1 Habitat and NVC surveys are not floristic surveys and not intended to create full species inventories or count all individuals of any plant species but to map and describe the vegetation communities. Species were recorded when they were encountered, but it is likely that additional species, not listed, are present within the

Study Area, particularly as species presence and visibility varies throughout the growing season.

- Plant species occurrence and visibility change both temporally and spatially. This is particularly true for colonising and invasive species. The data provided by habitat surveys is a snapshot in time (July 2022 for this survey) and cannot account for changes that occur outwith this time period. Non-native invasive species can be prolific colonisers. For example, Japanese knotweed spreads from rhizomes, rhizome fragments, as well as stem and crown fragments. Spread is usually a result of human intervention, such as spreading fragments in tyre treads (Fennell *et al.,* 2018). Additionally, at different times of year (e.g. winter) or life-stage (e.g. early colonisation) the identification of non-native invasive species can be challenging. Therefore, although non-native invasive species were considered during field surveys and field surveys were conducted at a suitable time of year, it is possible for non-native invasive species to be present within the Study Area and to have remained undetected.
- Habitat categories and the 'condition' of these categories are human (or artificial) constructs and, therefore, to a degree are subjective and a matter of professional judgement. Furthermore, different conditions can co-exist in an area of habitat (e.g. through drainage, preferential grazing, trampling etc.) and so it is not appropriate to assume an entire area of habitat is in one condition or another. Under these circumstances, it is usually reported that the habitat is approaching a particular condition or provided the most commonly occurring condition. This is fully recognised in Phase 1 Habitat, NVC and PCA assessments and consequently it is not always possible to be unequivocal when making judgements such as whether a particular habitat is classified under one condition or another. Where discrepancies have occurred with vegetation communities, they have been noted and explained.

The limitations were minimised by conducting the field survey within a suitable survey period by a highly experienced upland habitat surveyor.

It is important to note that measuring peat depth was outside the scope of these surveys. Apparent peat depth as discussed in this report is estimated based on visual vegetation assessments, through estimating peat depth from available features such as haggs, and ditches and by using a short peat probe (ca. 1 m in height).

Results

The Phase 1 Habitat and NVC survey map is shown in Figure 3. A list of vegetation communities recorded in the Study Area are displayed in Table 3. These are supported with a list of target notes and photographs (Appendix 1; Figure 6).

The Study Area was characterised by blanket bog habitat (M2, M17b, M19a). There were large areas of dry modified bog (No NVC community), and wet modified bog (M15c, M25). There was also dry heath (H10a), wet heath (M15c), acid grassland (U4, U5, U6), marshy grassland (MG10a, M28) and coastal grassland (MC10a). There were numerous flushes across the Study Area (M6b, M6c, M29).

Phase 1 Habitat	NVC Community	Area (Ha)	% of Study Area
Acid flush		**5.8**	**0.6**
	M29	0.1	0.0
	M6b	0.2	0.0
	M6b:M6c	0.4	0.0
	M6c	4.6	0.5
	M6c:M3	0.2	0.0
	M6c:MG10a	0.1	0.0
	M6c:U6	0.3	0.0
Acid grassland		**49.5**	**5.4**
	U4	8.3	0.9
	U4:MG10a:U6	8.6	0.9
	U4:U6	2.5	0.3
	U5	2.2	0.2
	U5:U6:U4:MG10	6.6	0.7
	U6	10.5	1.1
	U6:MG10:M25a	0.5	0.1
	U6:MG6	1.6	0.2
	U6:U5	7.1	0.8
	U6:U5:U4	1.6	0.2
Bare peat		**0.1**	**0.0**
	M3	0.1	0.0
Blanket bog		**560.6**	**60.8**
	M17b	488.6	53.0
	M17b:M2	24.7	2.7
	M19a	35.2	3.8
	M19a:M2	3.3	0.4
	M19a:M2:H10a:U6	8.3	0.9
	M19a:M2:M6	0.7	0.1
Coastal grassland		**1.2**	**0.1**
	MC10a	1.2	0.1
Dry heath		**49.2**	**5.3**
	H10a	49.2	5.3
Dry heath/acid grassland		**28.1**	**3.0**
	H10a:M19a:U5:U6	7.1	0.8
	H10a:MG10a:U4	1.6	0.2
	H10a:U4	3.7	0.4
	H10a:U6	7.0	0.8
	H10a:U6:M19a	1.3	0.1
	H10a:U6:M6c:M6b	0.5	0.1
	H10a:U6:MG10a	2.6	0.3
	H10a:U6:U5	2.0	0.2
	H10a:U6:U5:MG10a	1.2	0.1
	U6:H10a:U4:MG10a	1.2	0.1

Phase 1 Habitat	NVC Community	Area (Ha)	% of Study Area
Dry modified bog		**157.1**	**17.0**
	M15c:DMB:U6	2.2	0.2
	DMB:H10a	25.1	2.7
	DMB:M15c:M17b:M2:M3	4.2	0.5
	DMB:M15c:U6:H10	8.8	1.0
	DMB:M3:BP	64.1	6.9
	DMB:M3:BP:M17b	50.9	5.5
	DMB:M3:BP:U6:M2	1.8	0.2
Improved grassland		**10.9**	**1.2**
	MG6	10.9	1.2
Marshy grassland		**8.9**	**1.0**
	M28	0.0	0.0
	MG10a	1.0	0.1
	MG10a:M28	2.6	0.3
	MG10a:U5	0.5	0.1
	MG10a:U6	1.4	0.2
	MG10a:U6:H10a	2.4	0.3
	MG10a:U6:U5	1.1	0.1
Open water		**24.7**	**2.7**
Private		**3.2**	**0.3**
Road		**1.5**	**0.2**
Sand		**0.0**	**0.0**
Wet heath		**4.7**	**0.5**
	M15c	0.6	0.1
	M15c:M17b:U6:M2	4.1	0.4
Wet modified bog		**17.3**	**1.9**
	M15c:U6	1.5	0.2
	M17b	3.0	0.3
	M17b:M15c:U6	0.9	0.1
	M17b:M19:H10:U6	6.6	0.7
	M17b:MG10a	1.9	0.2
	M19a	0.9	0.1
	M25:U6	0.4	0.0
	U4 (WMB)	1.6	0.2
	U6 (WMB)	0.6	0.1
Total		**922.7**	**100**

Table 3: The total area of each of the Phase 1 Habitat/ NVC community found in the Study Area (Phase 1 Habitats in bold).

Habitat and Community Descriptions

Bog

A total of 79% of the Study Area was classed as a type of bog habitat. This included over 60% of the Study Area classed as blanket bog, a further 17% classed as dry modified bog and 2% classed as wet modified bog.

In Phase 1 Habitat surveys bog consists of vegetation over areas of deep peat (>0.5m). The areas defined as bog in the Study Area appeared to be on peat which was considered likely deeper than 0.5m.

In Phase 1 Habitat surveys bog is classified as modified if it appears '*significantly damaged'* and there is *'little to no sphagnum'* present (JNCC, 2010; JNCC, 2012). To determine whether bog is unmodified or modified depends primarily on the amount of bog-mosses present. Whether the vegetation is wet modified or dry modified bog is dependent on whether the vegetation resembles wet dwarf shrub heath (or grassland) or dry dwarf shrub heath.

All the bog within the Study Area had clearly been subject to some degree of modification through current and historic management practices, particularly grazing by sheep, peat cutting, and from drainage ditches as well as more global influences such as climate change and nitrogen deposition.

Where there was evidence of extensive modification or the bog appeared highly degraded, resulting in it no longer being bog vegetation with wide areas of bare peat or it was devoid of bog-moss, it has been included in the wet or dry modified bog category. However, much of the bog vegetation included some bog-moss species. Therefore, much of the bog has been classified as blanket bog, rather than modified bog. Although the bog-mosses were not usually a full, complete carpet, but often patchy.

Blanket bog

The blanket bog within the Study Area was characterised by damp to wet vegetation usually with frequent to abundant bog-mosses and occasional bog pools.

There was a total of three blanket bog NVC communities and sub-communities identified within the Study Area, including bog pool communities. The most extensive community across the Study Area was the M17b blanket bog community.

M2 *Sphagnum cuspidatum/fallax* bog pool community

Photo 1: An example of an M2 bog pool in the Study Area.

The M2 bog pool community was recorded occasionally in hollows within the blanket bog. The M2 pools usually had feather bog-moss and/or flat-topped bog-moss present. Common cottongrass was usually found growing sparsely through the bog-mosses.

These M2 bog pools were small, usually less than ca. 2m × 5m in size. These small bog pool communities were too small to map but some examples have been target noted and they were mapped as part of a mosaic with M17b in several locations.

M17b *Trichophorum germanicum – Eriophorum vaginatum* blanket mire community, *Cladonia spp*. sub-community

Photo 2: An example of M17 within the Study Area.

The majority of the Study Area was mapped as the blanket bog community M17b. It formed over much of the landscape on hillslopes and on convex and concave surfaces.

There was usually no true dominance within the M17b vegetation with heather and common cottongrass usually the most common species, but with abundant cross-leaved heath, bog

asphodel and hare's-tail cottongrass. Crowberry could be frequent and deergrass was variable in it abundance.

There was a variety of forbs occasionally present such as round-leaved sundew and bog asphodel. Less frequent but present included tormentil, common butterwort and heath spotted orchid.

The ground layer included bog-moss particularly red bog-moss but also a variety of other species including papillose bog-moss. The bog-mosses were generally patchily distributed but could become abundant especially around pools. Lichens and woolly fringe-moss were common. The M17b in the south of the Study Area seems to have more woolly fringe moss than the north. The lichens formed as an open layer over the vegetation. The liverwort, purple spoonwort was also frequently seen in this community.

There was often evidence of sheep use in the blanket bog with hoof marks and tracks common.

M19a *Calluna vulgaris – Eriophorum vaginatum* blanket mire community, *Erica tetralix* sub-community

Photo 3: An example of M19 within the Study Area.

Much of the M19a blanket bog vegetation was recorded towards the centre of the Study Area, with a notable large area with M2 bog pools in the west. M19a vegetation was also found near watercourses and lochans and as small patches within the wider M17b blanket bog landscape.

The M19a vegetation was dominated by heather and hare's-tail cottongrass which were often in a tussocky growth form. Crowberry was abundant and cross-leaved heath was constant but with a low abundance. There was also common cottongrass, heath woodrush and round-leaved sundew present near some bog pools. The ground flora was dominated by red bog-moss, with abundant glittering wood-moss and occasional lichens.

Dry Modified Bog

The dry modified bog within the Study Area had very little to no bog-mosses present and was characterised by vegetation which showed clear affinity to dry dwarf shrub vegetation, but on deep peat.

The dry modified bog was generally found on the hillslopes with bare peat. There were numerous erosion features. It was considered likely that historically these areas were filled with bog pools and bog-mosses which have been lost through draining of the bog habitat and erosion. Historically these areas were likely to be similar to the areas mapped as blanket bog with bog pools (M17b:M2) but the pools have been lost leaving bare eroding peat. Sometimes these two stages were very close together or a transition was apparent.

There was often evidence of sheep use in the dry modified bog with hoof marks and wool on the erosion features.

There were very rarely any bog-mosses present. Where they were present it was usually a very small, isolated patch of red bog-moss. The bog-mosses, where they did occur, were confined to the hollows and were often drying out.

Dry Modified Bog (DMB) (No- NVC community)

Photo 4: An example of DMB within the Study Area.

The dry modified bog was not given an NVC community, but it was clearly derived from M17b blanket bog vegetation and was transitioning to a dry heath vegetation. It was largely dominated by heather with woolly fringe moss often an important and conspicuous part of the vegetation. There was a mix of dwarf shrubs including bell heather, cross-leaved heath and occasionally crowberry. Common cottongrass was frequently present with deergrass. There was a distinct absence of hare's-tail cottongrass. There was occasional round-leaved sundew in isolated wetter areas. Lichens were abundant over the vegetation.

There were occasional patches of red bog-moss in damp areas.

M3 *Eriophorum angustifolium* bog pool community

Photo 5: An example of a M3 bog pool which was largely bare peat with a little common cottongrass in dry modified bog.

The M3 community formed on redistributed, eroded peat and as part of erosion features within the dry modified bog habitat. It was often as dry bare peat and speckled with common cottongrass. Sometimes these areas had small lawns of red bog-moss around the edge.

Wet Modified Bog

The wet modified bog within the Study Area had very little to no bog-mosses present and was characterised by vegetation which showed affinity to either grassland communities or wet heath.

Most of the communities described as part of the wet modified bog are also described elsewhere but were over what appeared to be deep peat and had clearly experienced modifying influences which separated them form the blanket bog category. This included:

- U6 acid grassland in an area of likely historic peat cuttings.
- U4 grassland in a sheep grazed field.
- M15c wet heath in an area where peat has been drained and there was evidence of historic farm activities.
- A form of M19a which was very dry with little hare's-tail cottongrass and abundant crowberry.
- M17b over a clear line of redistributed peat, perhaps an old road or underground pipe.

There was a single NVC community which was only recorded as part of the wet modified bog.

M25 *Molina caerulea – Potentilla erecta* mire community

There were two small patches of M25 recorded near the top of a watercourse. Common cottongrass and hare's-tail cottongrass were abundant with tussocky purple moor-grass. There was a high abundance of common sedge, mat grass and carnation sedge with more

occasional cross-leaved heath and heather. Forbs included bog asphodel, tormentil autumn hawkbit and marsh willowherb. This area of M25a appeared to be on deep peat.

Wet dwarf shrub heath

The wet dwarf shrub heath was on shallow soils to the very north of the Study Area and in the west between Hill of Garth and Sand Water where it appeared peat had been removed through peat cuttings.

M15c *Trichophorum germanicum – Erica tetralix* wet dwarf shrub heath community *Cladonia* species sub-community

Photo 6: An example of M15c within the Study Area.

The M15c community was on shallow soils to the very north of the Study Area and in the west between Hill of Garth and Sand Water where it appeared peat had been removed through peat cuttings. It was characterised by the typical mix of species including heather, deergrass, common cottongrass, tormentil and cross-leaved heath. The wet heath in the north of the Study Area had a high prominence of heath rush and mat grass with crowberry also present. Lichens and woolly fringe moss typically formed the ground layer with patches of red bog-moss. Rocks were often showing through and there were patches of bare peat.

Dry heath

H10a *Calluna vulgaris – Erica cinerea* heath Typical sub-community

The dry heath was recorded in a large area in the west of the Study Area around Toft, in small patches across the Study Area and as mosaics with grassland and along the steep banks of watercourses. It was dominated by heather, with few other dwarf shrubs present, although crowberry was occasional. Graminoids could be quite abundant including heath rush, purple moor-grass, heath woodrush, sweet vernal grass, Yorkshire fog, mat grass, wavy hairgrass and green ribbed sedge. There was a little tormentil and common mouse-ear. Ragwort was present in the dry heath community when it was close to tracks/roads. The ground layer was usually dominated by glittering wood-moss, with little shaggy-moss frequently present.

Photo 7: An example of dry heath within the Study Area.

Flush

There were many flush habitats within the Study Area, most were thin seepage lines of vegetation. Some were considered likely to be natural, although some were likely infilled historic drainage ditches.

M6b *Carex echinata – Sphagnum fallax* mire, *Carex nigra – Nardus stricta* sub-community

In this soligenous acid flush sub-community common sedge was generally the most abundant sedge species. It was found as small lines of vegetation with water flowing into larger watercourses.

These flushes usually had a thick moss layer of feathery bog-moss and flat-topped bog-moss sometime with common-haircap. There was a mixture of other species present including creeping bent, bulbous rush, heath rush, bog asphodel, common cottongrass and tormentil.

M6c *Carex echinata – Sphagnum fallax* mire, *Juncus effusus* sub-community

Photo 8: An example of M6b and M6c within the Study Area.

The M6c sub-community is a soligenous acid flush which was occasionally recorded as small lines of vegetation where water flowed down the hillside or as part of larger watercourses. It was dominated by soft rush with sedges much less frequent than the M6b sub-community. Flat-topped bog-moss and common haircap typically formed the thick ground flora. There was also creeping bent, tormentil, Yorkshire fog, and papillose bog-moss.

M29 *Hypericum elodes – Potamogeton polygonifolius* soakaway community

The M29 community was mapped in one location towards the northwest of the Study Area. The community was dominated by bog pondweed with lesser spearwort. The M29 community was associated with an area of very sluggish water movement flowing in diffuse channels and may have groundwater association.

Marshy grassland

MG10a *Holcus Lanatus – Juncus effusus* rush-pasture, typical community

There were areas along the watercourse channels, beside watercourses and in wet ground that were dominated by soft rush with Yorkshire fog. The wettest areas were usually overwhelmingly dominated by soft rush, but in slightly drier areas sweet vernal grass and Yorkshire fog became more common. There was also occasional to frequent crested dog's-tail, marsh willowherb, common sorrel, water forget-me-not, bittercress, tormentil and marsh thistle. Common haircap was the main moss species present in these areas.

M28 *Iris pseudacorous – Filipendula almaria* mire, community

Photo 9: An example of M28 within the Study Area.

There were several stands of the yellow iris dominant mire M28 forming the wet channels of marshy grassland around the croft towards the centre of the Study Area. This was within small drainage channels within the grassland communities. Yellow iris dominated often almost entirely, but there was also some Yorkshire fog, common sorrel, marshy thistle, marsh willowherb and sweet vernal grass.

Coastal Grassland

MC10a *Festuca rubra* - *Plantago spp*. maritime grassland, *Armeria maritima* sub-community

Photo 10: An example of MC10a within the Study Area.

Coastal grassland MC10a was mapped as a small line along the coast at the very north of the Study Area. The coastal grassland was dominated by red fescue and thrift. Buck's-horn plantain and sea plantain were abundant and constant in the sward. Other graminoids included creeping bent, sweet vernal grass, heath rush and mat grass. There was commonly autumn hawkbit and eyebright.

Sheep grazing was particularly noticeable and influential in the coastal grassland habitat. It was short cropped (ca. 3-8cm), tightly entwined, with cushions of thrift and mats of plantains. The vegetation was wind swept and had dung and fleece evident from the sheep.

Improved grassland

MG6 *Lolium perenne – Cynosurus cristatus* community

There some MG6 improved grassland in the northeast of the Study Area around Toft. The MG6 was dominated by perennial rye grass with Timothy, Yorkshire fog and common bent grass. There was a mixture of daisy, white clover, creeping buttercup, chickweed, common mouse ear and sheep's sorrel. There were occasional patches of dock. The large field with MG6 improved grassland was likely used for silage or hay.

Acid Grassland

Over 5% of the Study was characterised by acid grassland. This was generally a mix of the following three NVC communities.

U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland community

The U4 grassland was generally recorded in sheep grazed fields around the edge of the Study Area. It was characterised by an uneven sward of Yorkshire fog, sweet vernal grass, common bent, sheep's fescue and mat grass with heath woodrush. There was a mix of forbs including tormentil, selfheal, common mouse ear and lesser stitchwort.

U5 *Nardus stricta – Galium Saxatile* grassland community

The U5 grassland was dominated by mat grass, with a varying but quite high abundant of heath rush. There was a mixture of other grasses including viviparous sheep's fescue, Yorkshire fog, common bent and sweet vernal grass. Heath woodrush was commonly present. Forbs included tormentil, heath bedstraw, dog violet. There were occasionally patches with heather and marsh thistle. The moss layer was dominated by glittering wood-moss and common haircap in wetter places.

Photo 11: An example of U5 acid grassland within the Study Area.

U6 *Juncus squarrosus – Festuca ovina* grassland community

There were small patches of the U6 heath rush dominated grassland across the Study Area. Heath rush was dominant although mat grass could be very abundant in some stands, making it difficult to distinguish between U5 mat grass grassland and U6 heath rush grassland in some locations. However, where heath rush was considered to be dominant, and mat grass subordinate, it was assigned the U6 grassland community.

The U6 grassland community included heath bedstraw, tormentil and a little heather. There were a variety of other graminoids present including wavy hairgrass, sweet vernal grass and heath wood-rush The moss layer was made up of forked-moss, glittering wood-moss and occasional patches of bog-mosses.

Photo 12: An example of U6 acid grassland within the Study Area.

Tall ruderal

OV24a *Urtica dioica – Galium aparine*, typical sub-community

There was a dense stand of nettles which was in an area heavily managed for sheep.

Open water

There were several lochs, lochans and pools within the Study Area, including Neshion Water, Sand Water and Loch of Bordigarth. These lochans usually had little to no emergent vegetation within them. The water was generally a peat-stained brown with a stoney and gravel/coarse sand base.

Photo 13: An example of open water within the Study Area (Sand Water).

Running water

There were several watercourses within the Study Area including the Burn of Crooksetter in the west, and a series of unnamed burns. These watercourses were generally small, less than 1m wide with a rocky or peaty base.

Photo 14: An example of running water within the Study Area.

Sand

There was a small area of sand mapped along the edge of Sand Water (Photo 13).

Peatlands and Peatland Condition

Table 4 provides an overview of the PCA within the Study Area. The PCA is shown in Figure 4, but it should be noted there is some degree of subjectivity in the PCA, and so the map should be considered indicative.

PCA Category	Area (Ha)	% of Study Area
Near-Natural	27.8	3
Modified	598.6	65
Modified to Actively Eroding	1.8	<1
Actively Eroding	175.1	19
Other habitat types	119.3	13
Total	*922.6*	*100*

Table 4: The total area and percentage of each PCA found in the Study Area.

The blanket bog habitat and its condition was notably variable across the Study Area, and was on a continuum from very wet, high quality blanket bog to Modified through grazing pressure, Drained through a series of drainage ditches to areas that were considered degraded and Actively Eroding.

Near-Natural Condition

Photo 15: An example of blanket bog in Near-Natural condition within the Study Area.

The blanket bog which was considered to be in or approaching a 'Near-Natural' condition contained complexes of bog pools, bog-moss hummocks with a relatively intact bog-moss layer. There was limited sign of drainage. Some grazing impacts were evident.

Modified Condition

Photo 16: An example of blanket bog in a Modified condition within the Study Area.

Most of the blanket bog within the Study Area was considered to be Modified through current and historic management practices, particularly grazing, but possibly also historic burning. The modification was generally quite light with bog-mosses present in the vegetation, but not a complete carpet. Heather and cottongrasses were the dominant species. Bog pools were occasionally present. Some areas had been further modified through historic peat cuttings, and farm/building activities.

Drained Condition

Drainage ditches were a feature in some parts of the Study Area. Most of the drainage ditches appeared quite old and had vegetation infilling them, but it is likely that there remains some drainage influence. There was ca. 12.2km of drainage ditches mapped within the Study Area. In Figure 4, a 30m buffer has been shown around all the drains demonstrating the area of vegetation which is likely drained by these features. There were also numerus flushes across the Study Area. Some of these were likely historic drains that had fully infilled with bog-mosses and sedges.

Photo 17: An example of blanket bog in a Drained condition within the Study Area.

Actively Eroding Condition

Photo 18: An example of blanket bog in Actively Eroding condition within the Study Area.

A total of 17% of the Study Area was classified as Actively Eroding according to the PCA. These were the areas of Dry Modified Bog from the Phase 1 Habitat survey, in which there was extensive areas of bare peat, blocks of peat broken off and some bare peat pans. Many of these areas appeared to have once been locations where pools were common, but had dried or drained out resulting in bare peat being exposed. The areas termed Actively Eroding should also be considered to be Drained and Modified.

There was one area of blanket bog which was considered Modified to Actively Eroding. This area had some pools remaining, but was draining with areas where pools had been lost resulting in bare peat patches. This area appeared to be on a trajectory from once Near-Natural condition towards the Actively Eroding condition.

Potential for Peat Forming Activity

Using the 'PCA support tool' the blanket bog in Near-Natural condition in the Study Area, where there were multiple surface water pools, hummocks and a degree of natural surface pattern was considered likely to be actively forming peat.

The blanket bog and wet modified bog in a Modified and/or Drained condition was where taller plants, such as cottongrasses and heather dominated and there was little surface water present were considered likely to have stopped being active.

Areas that were considered to be in an Actively Eroding condition with bare peat extensive with deep gullies was considered likely to be inactive and a carbon source, rather than a carbon sink.

However, this is a broad-brush, subjective tool, and does not take into account subtleties and variation within the blanket bog. Given the location of the Study Area, and the reasonable quality of at least some of the blanket bog which was Modified condition there is a degree of uncertainty to the peat forming activity level. These areas may have patches around pools that were active or partially active in some conditions.

GWDTE Assessment

Potential GWDTE are shown in Figure 5. GWDTE are protected under the Water Framework Directive. BGS hydrogeological mapping identifies that the geology underlying the Study Area was considered to be a low productivity aquifer with groundwater only present in near surface weathered zone and secondary fractures (BGS, 2023). Therefore, there is limited potential for the presence of actual GWDTE within the Study Area.

SEPA's Guidance Note (2017a) recommends that the listed NVC communities should be treated as GWDTE unless information can be provided to demonstrate they are not dependent on groundwater. SEPA (2017a) does recognise that some of these communities are common across Scotland and that these communities may be considered GWDTEs only in certain hydrogeological settings or may have limited dependency on groundwater in certain hydrogeological settings.

NVC communities recorded in the Study Area that are considered in the guidance (SEPA, 2017a; SEPA, 2017b) to be potentially groundwater dependent include:

- M6 *Carex echinata – Sphagnum fallax* mire;
- M15 *Trichophorum germaincum – Erica tetralix* wet dwarf-shrub heath;
- M25 *Molinia caerulea – Potentilla erecta* mire;
- M28 Iris pseudacorous – Filipendula almaria mire, community
- M29 Hypericum elodes – Potamogeton polygonifolius soakaway community;
- MG10 *Holcus lanatus – Juncus effusus* rush-pasture; and
- U6 *Juncus squarrosus – Festuca ovina* grassland.

Of these, M6 and M29 are considered to be potentially highly groundwater dependent, depending on the hydrological setting (SEPA, 2017a). All the other communities are considered potentially moderately groundwater dependent, depending on the hydrological setting (SEPA, 2017a). All mosaics of habitat were allocated their GWDTE category according to the NVC community with the highest potential GWDTE.

The flush communities M6 and M29 are considered to be potentially highly groundwater dependent as they are indicators of groundwater influence, although some of the M6 flushes could have been influenced by historic drainage ditches.

Much of the potential GWDTE communities occurred as part of the ombrotrophic peatland bog system, e.g. the wet heath M15c and wet modified bog M15c and M25. Their presence is considered to generally be related to the presence of waterlogged conditions sustained the surrounding peatland bog system. As such, these communities were considered likely to be reliant on direct rainfall and limited drainage within the peatbog system, rather than groundwater, for their maintenance.

Table 5 displays the relationship between NVC communities, and the likelihood of groundwater dependency, with comments on the hydrological setting in the Study Area (Botanæco, 2019b). Hydrological surveys/analysis by a qualified hydrologist will be required to confirm whether or not these potential GWDTE are actual GWDTE.

Habitat	NVC Community	FWT Category	Guidance potential GWDTE	Setting	Comment on Setting	Comment on GWDTE
Acid grassland	U4, U5	Montane grassland	Not included			Not a GWDTE
Acid grassland	U6	Montane grassland	Potentially Moderately GWDTE	Hillslopes with other acid grasslands	Set on peaty soils with the bedrock classed as a low productive aquifer	Potentially moderately GWDTE, but likely that most influence is from the heavy rainfall in the region.
Bare peat	M3	Peat bog	Not a GWDTE	Peat bog	Ombrotrophic	Not a GWDTE
Blanket bog and bog pools	M2, M17b, M19	Peat bog	Not included	Peat bog	Ombrotrophic.	Not a GWDTE
Coastal grassland	MC10	Not a wetland	Not a GWDTE			Not a GWDTE
Dry dwarf shrub heath	H10	Not a wetland	Not a GWDTE			Not a GWDTE
Dry modified bog	DMB	Peat bog	Not included	Peat bog	Ombrotrophic.	Not a GWDTE.
Flush	M6	Flush	Highly	Streamside and along potentially along drainage ditch lines	The M6 community was in small lines along watercourse channels and potentially historic drainage ditch lines.	Potentially highly GWDTE, but likely also influenced by the ombrotrophic bog and surface water.
Flush	M29	Flush	Highly	Hillslope	There was a single M29 flush at the head of a watercourse.	Potentially highly GWDTE.
Improved grassland	MG6	Not a wetland	Not a GWDTE			Not a GWDTE
Marshy grassland	MG10a, M28	Marshy grassland	Moderate	Streamside	The MG10a and M28 communities were associated with surface water movement.	Potentially moderately GWDTE but likely influenced by the surface water.

Habitat	NVC Community	FWT Category	Guidance potential GWDTE	Setting	Comment on Setting	Comment on GWDTE
Tall ruderal	OV24	Not a wetland	Not a GWDTE			Not a GWDTE
Wet modified bog	M15c, M25a	Wet heath	Moderate	Associated with impacts on the peatland habitat.	The wet modified bog M25 and M15c communities were found as part of the peatland habitat influenced by current and historic management activities and were considered to be ombrotrophic.	Likely most influenced from the ombrotrophic bog.

Table 5: The relationship between NVC communities, FWT categories and potential GWDTE.

Species of Note

The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. None of the plant species recorded in the Study Area are on the SBL.

No non-native invasive species of plant were identified within the extent of the Study Area However, this does not preclude them from being present in the future or their presence in an un-vegetative/unidentifiable state during surveys.

Habitats of Note

Habitats within the Study Area that are considered to be consistent with, or similar to, SBL habitat descriptions and Annex 1 habitats listed in the EU Habitats Directive are shown in Table 6.

NVC community	Annex 1 Habitat (*priority)	SBL Habitat
H10	✓	✓
M15	✓	✓
M17	✓*(when active)	✓
M19	✓*(when active)	✓
M2	✓	✓
M25	✓	✓
M28	✓	✓
M29	✓	✓
M3		✓
M6		✓
U5		✓
U6		✓

Table 6: SBL and Annex 1 habitats recorded in the Study Area.

Discussion

The Study Area was mapped and described according to the Phase 1 Habitats descriptions and the NVC. The Study Area was characterised by blanket bog and dry modified bog with the most common community mapped across the site being M17b. Less frequently recorded habitats including dry heath, wet heath, acid grassland, coastal grassland and marshy grassland. There were many flushes across the Study Area. These habitats and communities are all typical for Shetland.

Peatland habitats, such as the blanket bog that made up much of the Study Area, are important for a number of reasons, including their potential for storing and capturing carbon. Peatlands are recognised as globally important providers of ecosystem services, including for provision of food and fibre, water supply, climate regulation, biodiversity, recreation and cultural heritage. As such, priority peatland habitats are referred to in Scottish Planning Policy (SPP, 2014) and more recently in the Scottish Biodiversity Strategy (2022), the Onshore Wind Policy

Statement (2022) and the National Planning Framework 4, which was adopted by Scottish parliament in February 2023 (NPF4, 2022).

In relation to wind farm development and peatland habitats Policy 5 of NPF4 gives "*significant protection*" to carbon rich soils, deep peat and priority peatland habitats. It states that "*assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice… alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration*".

Therefore, it is important to carefully consider priority peatland habitats within the Study Area with regard to the Proposed Development. All the blanket bog, dry modified bog and wet modified bog within the Study Area would be considered a priority peatland habitat as per NPF4. Best practice guidance e.g. CIEEM (2018; 2019) and NPF4 identifies a hierarchy of mitigation for potential impacts that seeks to:

- avoid adverse ecological impacts, especially those that could be significant to important receptors;
- minimise adverse impacts that could not be avoided; and
- compensate for any remaining significant residual impacts.

CIEEM (2018; 2019) states that "*Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of a project from the earliest stages of scheme design and throughout its development*". This approach, to avoiding potential adverse impacts within a design layout, is sometimes described as embedded mitigation or mitigation by design. "*Mitigation by design is particularly beneficial as there is greater certainty that it will be delivered*" (CIEEM, 2018; 2019).

Avoidance of the habitats identified within with higher ecological value, including blanket bog particularly blanket bog in Near-Natural condition and any potentially high GWDTEs is recommended wherever possible. Minimisation of impacts and compensation of any significant impacts on semi-natural habitat would be required where avoidance is not possible as per the mitigation hierarchy.

There is a great deal of potential for peatland restoration within the Study Area, particularly in the form of drainage ditch blocking and restoration of areas that were in an Actively Eroding condition. Blocking the drainage ditches and blocking and reprofiling erosion features would help to re-wet the peatland habitat and help to establish a more natural drainage pattern. This would benefit not only the vegetation but the numerous species that depend upon it such as invertebrates and wading birds. Peatland restoration should be explored as part of a habitat management plan should the Proposed Development proceed.

When assessing the potential impact of the Proposed Development, the presence and importance of key species and habitats should be considered. Furthermore, this should be informed by the likely design layout, as features of particular importance e.g. blanket bog in

Near-Natural condition fen and other highly GWDTE may be able to be completely avoided at the design stage.

References

Atherton, I., Bosanquet, S. and Lawley, M. 2010. *Moss and liverworts of Britain and Ireland: a field guide*. British Bryological Society, Plymouth.

Averis, B., and Averis, A. 2020. Plant communities found in surveys by Ben and Alison Averis but not described in the UK National Vegetation Classification. non-nvc vegetation types found by ben and alison averis 2020-06 version with image resolution reduced .pdf (benandalisonaveris.co.uk)

Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. 2004. *An illustrated guide to British upland vegetation*. JNCC, Peterborough.

Botanæco. 2020. *GWDTE Go with the flow*. www.botanaeco.co.uk/blog.

British Geology Society (BGS). 2023a. *Geology of Britain Viewer*. http://mapapps.bgs.ac.uk/geologyofbritain/home.html. Accessed October 2021.

BGS. 2023b. *GeoIndex Onshore*. http://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap. Accessed October 2021.

Chartered Institute of Ecology and Environmental Management (CIEEM). 2018. *Guidelines for ecological impact Assessment in the United Kingdom and Ireland*. Version 1.1. Updated September 2019.

Cooper, E.A. 1997. *Summary descriptions of national vegetation classification grassland and montane communities*. JNCC, Peterborough.

Elkington, Dayton, N., Jackson, D.L. and Strachan, I.M. 2001. *National vegetation classification field guide to mires and heaths*. JNCC, Peterborough.

Glenk, K., Martin-Ortega, J., Byg, A. 2017. *Online Condition Assessment Support Tool*. Peatland Action, Scottish Natural Heritage.

Peatland Action, 2016. *Peatland Condition Assessment Guide*. https://www.nature.scot/sites/default/files/2017-10/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf.

Rodwell, J.S. (ed.) 1991a. *British Plant Communities volume 1 Woodlands and Scrub*. Cambridge University Press, Cambridge.

Rodwell, J.S. (ed.) 1991b. *British Plant Communities volume 2 Mires and Heaths*. Cambridge University Press, Cambridge.

Rodwell, J.S. (ed.) 1992. British Plant Communities volume 3 Grassland and Montane Communities. Cambridge University Press, Cambridge.

Rodwell, J.S. (ed.) 1995. *British Plant Communities volume 4 Aquatic Communities, Swamps and Tall-herb Fens*. Cambridge University Press, Cambridge.

Rodwell, J.S. (ed.) 2001. *British Plant Communities volume 5 Maritime communities and vegetation of open habitats*. Cambridge University Press, Cambridge.

Rodwell, J.S. 2006. *National Vegetation Classification Users' Handbook*. JNCC, Peterborough.

Scottish Environment Protection Agency (SEPA), 2017a. *Land-Use Planning System SEPA Guidance Note 4: Planning Guidance on Wind Farm Developments*. LUPG-GU4 Issue No' 9.

SEPA, 2017b. *Land-use planning system SEPA guidance note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. LUPG-GU31 Version 3.

Scotland and Northern Ireland Forum for Environmental Research (SNIFFER), 2009a. WFD95: *A Functional Wetland Typology for Scotland – Project Report.*

SNIFFER, 2009b. WFD95: *A Functional Wetland Typology for Scotland – Field Survey Manual*. Version 1.

Scottish Government. 2022. Biodiversity strategy to 2045: tackling the nature emergency - gov.scot (www.gov.scot). Published in draft, December 2022.

Scottish Government. 2022. Onshore Wind Policy Statement 2022. December, 2022.

Scottish Government. 2023. National Planning Framework 4: revised draft. February 2022.

Streeter, D., Hart-Davis, C., Hardcastle, A., Cole. F. and Harper, L. 2016. *Collins Flower Guide 2nd Edition*: Collins.

Figure 3a Phase 1 Habitats and NVC communities – North

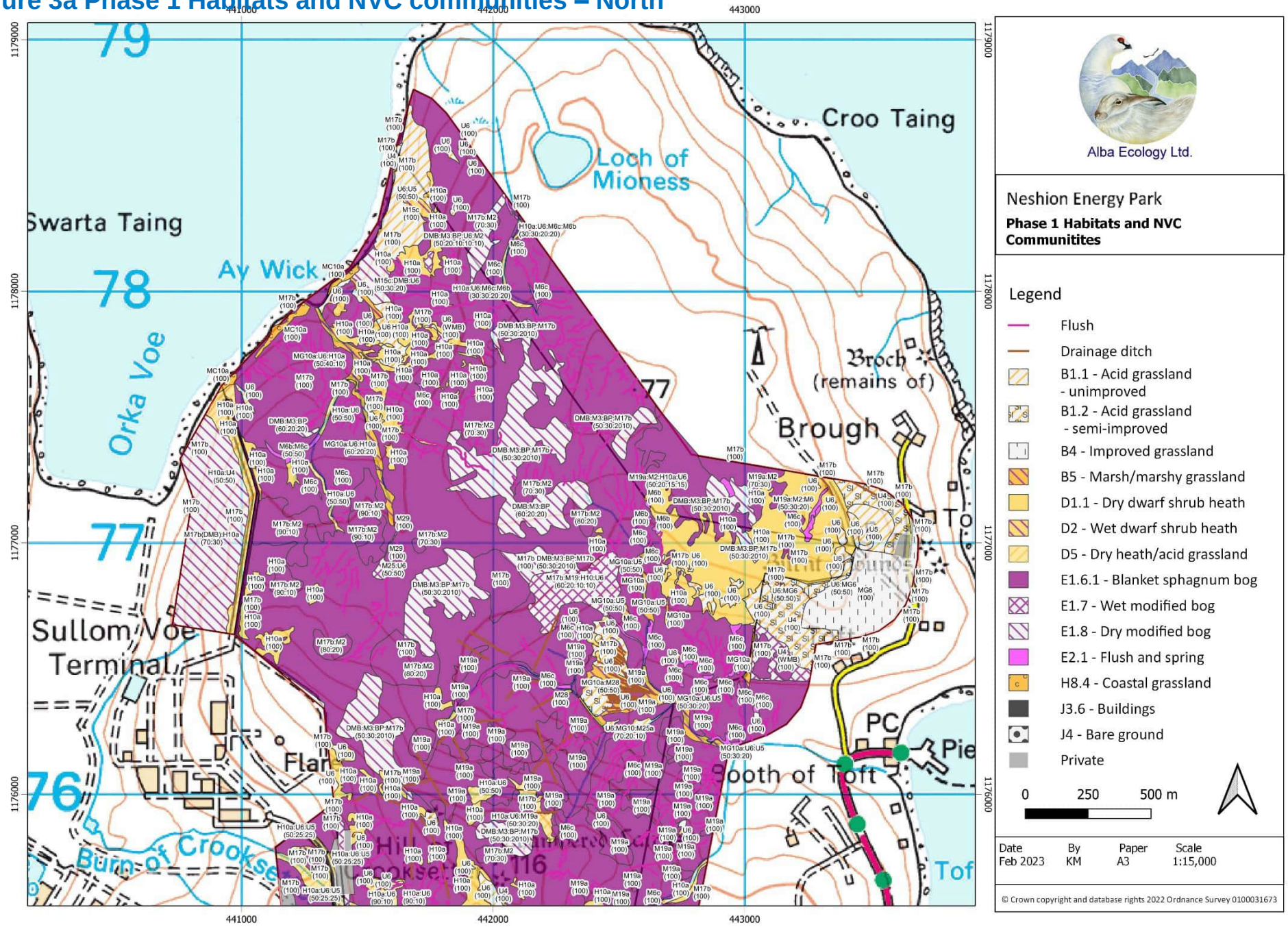


Figure 3b Phase 1 Habitats and NVC communities – South

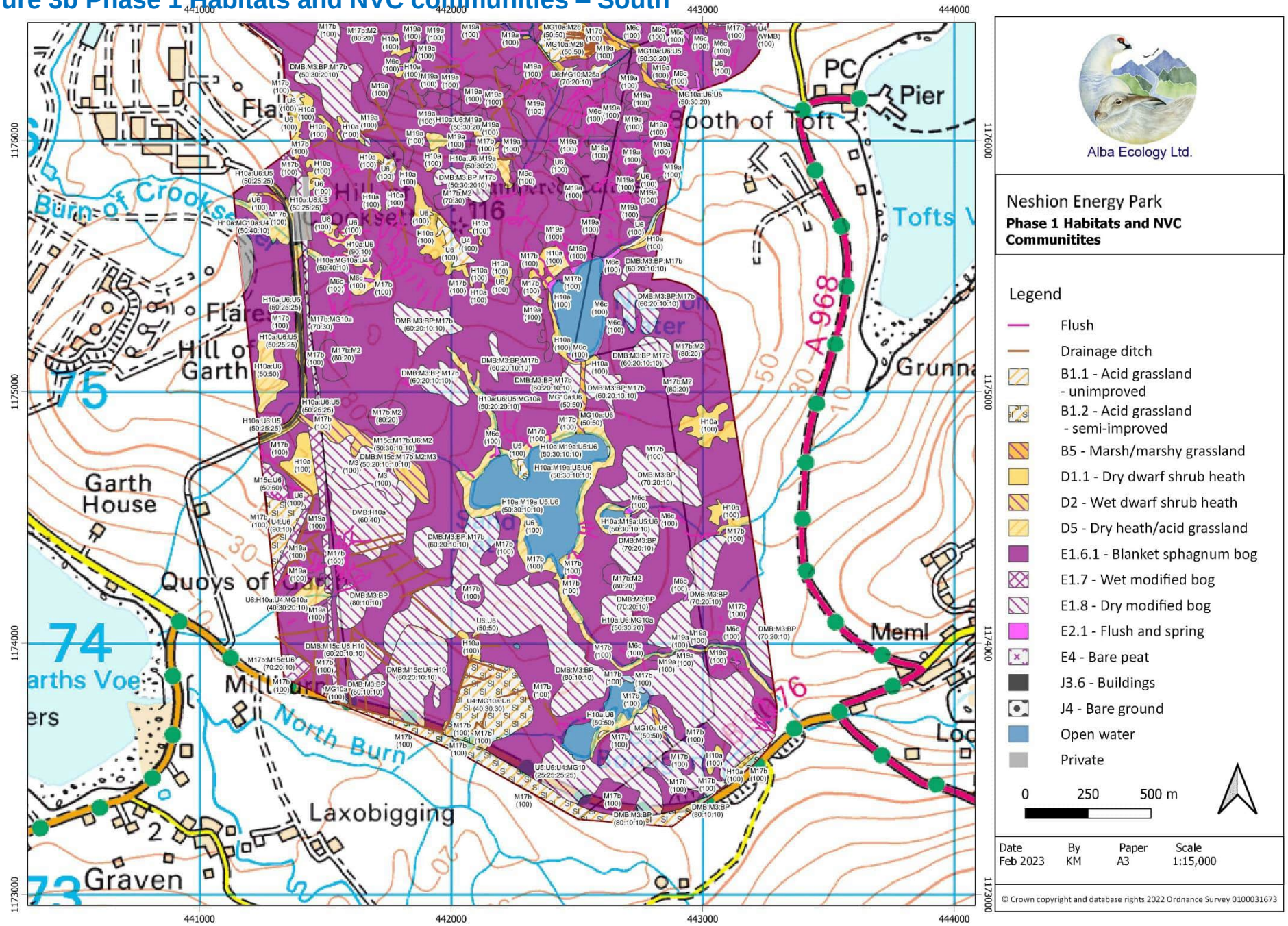
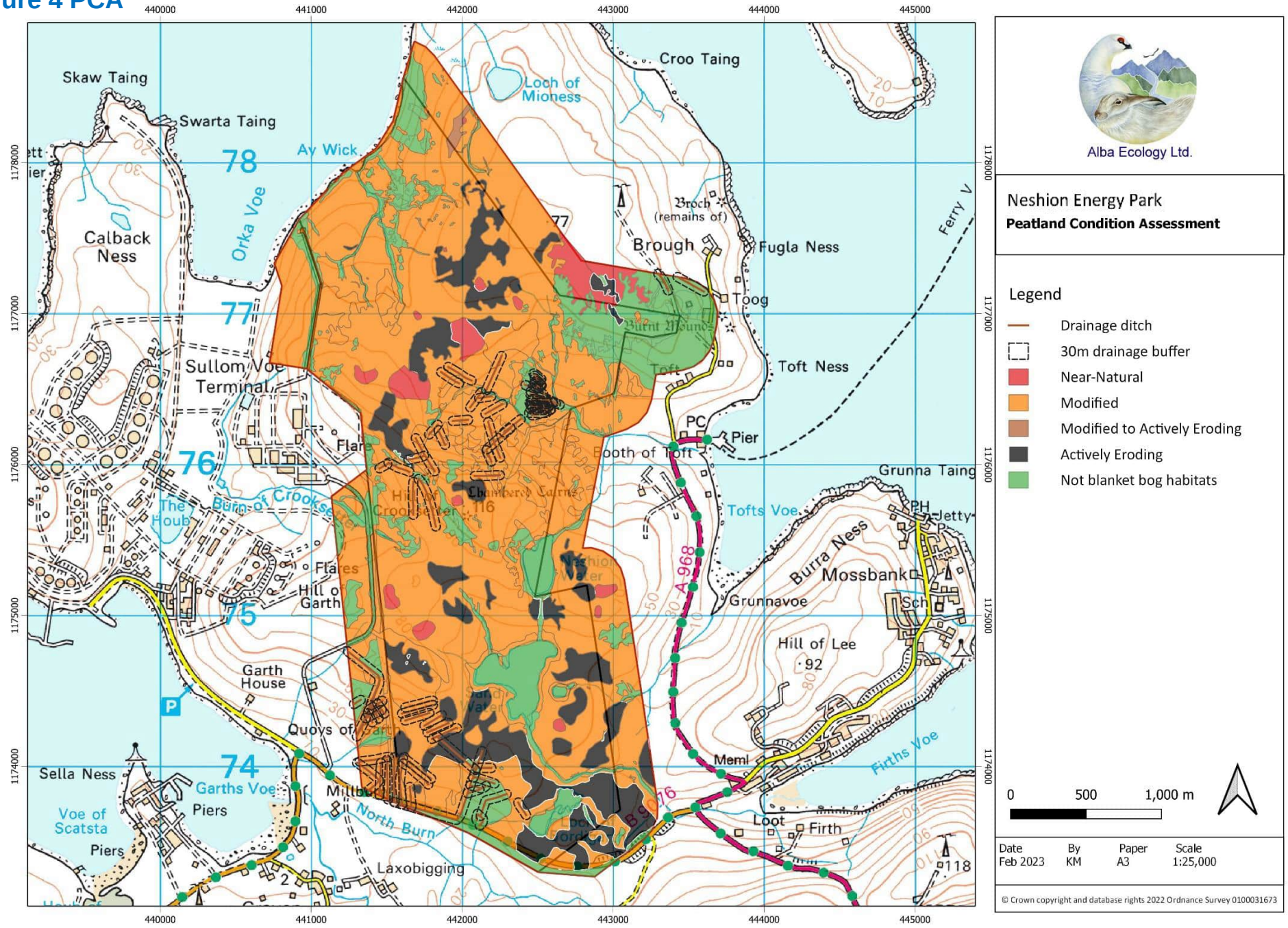


Figure 4 PCA



Alba Ecology Ltd.

Neshion Energy Park

Peatland Condition Assessment

Legend

- Drainage ditch
- 30m drainage buffer
- Near-Natural
- Modified
- Modified to Actively Eroding
- Actively Eroding
- Not blanket bog habitats

Date	By	Paper	Scale
Feb 2023	KM	A3	1:25,000

Figure 5 Potential GWDTE

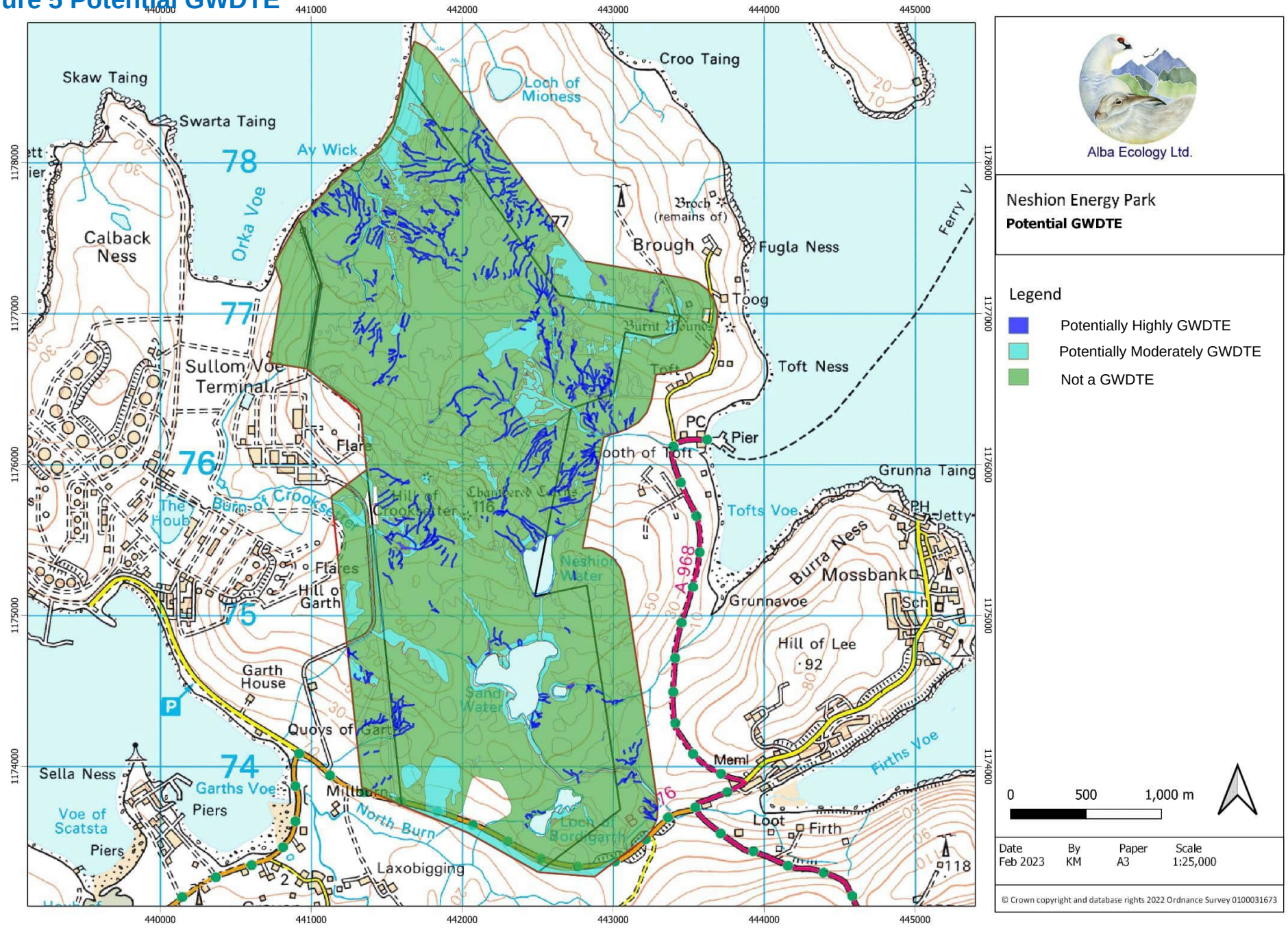
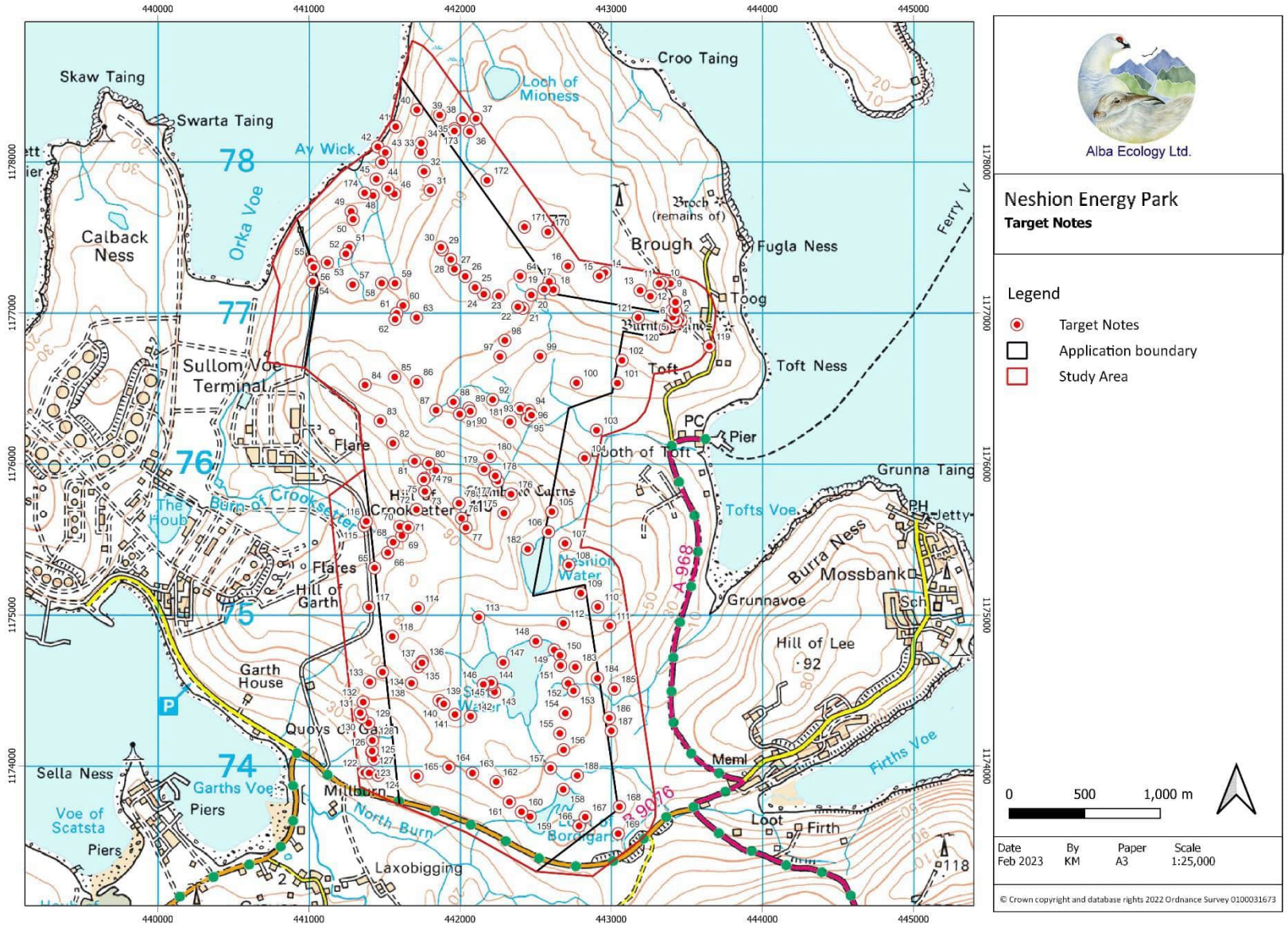


Figure 6 Target Notes

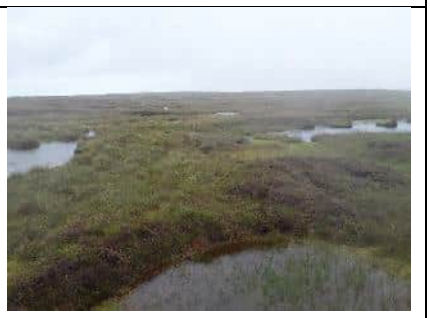


Appendix 1 Target Notes for Neshion Energy Park Habitat Survey

TG	Grid	Comment	Photo
1	HU 43461 76952	MG6 improved grassland for silage or hay. Vegetation was ca. 30cm tall. Mix of rye grass, Timothy, Yorkshire fog, bent grasses and forbs including white clover, creeping buttercup and common chickweed.	
2	HU 43438 76967	Typical MG10a. Soft rush with Yorkshire fog.	
3	HU 43425 76927	Mix of dominance between heath rush and mat grass. The wetter areas were dominated by heath rush (U6) drier areas dominated by mat grass (U5).	
4	HU 43430 76947	Thick patch of nettles (OV24) showing enrichment. Raised area. Likely dump of silage or similar. Area is sheep grazed.	
5	HU 43406 76972	Hillside of H10a with abundant heath rush.	

TG	Grid	Comment	Photo
6	HU 43401 77016	Some patches on the dry heath hill slope were dominated by heath rush (U6).	
7	HU 43426 77016	Track edge was a mix of MG10a, U6 and U4. There was a ditch (ca. 2m wide) with bulbous rush and creeping bent grass.	
8	HU 43425 77071	Field with U5 in the centre, and U4 around the outside with some clear transition. The U5 was relatively tall.	
9	HU 43391 77195	U4 dominated area around edges of fields and sometimes beside tracks.	
10	HU 43344 77202	Drainage ditch was ca. 1m wide and ca. 20m of it appeared recently re-cut. There was bulbous rush, heath rush and feathery bog-moss in the ditch.	

TG	Grid	Comment	Photo
11	HU 43317 77195	Flush/Spring M6b. 100% cover of feathery bog-moss with bulbous rush and some common haircap and flat-leaved bog-moss. There was also common cottongrass throughout the flush. This flush appeared to be on deep peat with a line of flowing water through it.	
12	HU 43259 77110	At the head of the spring the vegetation was a complex of M6:U6 (50:50).	
13	HU 43191 77149	M19a:M2:M6b (50:30:20). Complex of pools and wet areas surrounded by M19a blanket bog. Some soft rush present. Clearly grazed but retained some pools. There were occasional hummocks of red bog-moss. Area appears to have resisted grazing damage as so wet. Near-Natural.	
14	HU 42958 77266	M19a:M2. Area has large and small pools. Wet and feathery bog-moss rich. It was clearly sheep grazed, but much less modified than surrounding bog as retained wetness (likely topology related). Near-Natural.	
15	HU 42921 77244	M6b dominated by common sedge. In with M2 pools, feeding into lochan.	

TG	Grid	Comment	Photo
16	HU 42713 77310	Complex of blanket bog, pools, dry heath and acid grassland. Very wet in places with pools. Topography/land-use has resulted in dry heath on higher ground and M2 pools in lower ground. The Pools varied in size from ca. 1m x 1m to 10m x 10m. There was M19a throughout, but also drier patches of U6. Variable peat depth. Near-Natural to Modified condition.	
17	HU 42590 77208	Series of M6b flushes going to watercourses. Flushes were 1m to 2m wide. Flushes were dominated by feathery bog-moss, flat-leaved bog-moss with common sedge creeping bent-grass and bulbous rush.	
18	HU 42617 77154	Carpet of bog-mosses and common haircap with tussocks of common sedge and heath rush with tormentil. At the transition between dry heath and blanket bog.	
19	HU 42556 77157	M17b vegetation. Bog-mosses present but not a full carpet – patchy. Relatively forb rich. Few bare peat patches. Clearly grazing pressure from sheep. Likely deep peat. No bog-moss hummocks. No pools. Modified.	 

TG	Grid	Comment	Photo
20	HU 42471 77119	Watercourse with ca. 1.5m erosion features to either side.	
21	HU 42415 77031	Likely old peat cutting. Fully revegetated with H10a but has distinctive shape.	
22	HU 42382 77040	Several M2 pools in M17b. Series of pools. There were hummocks of woolly fringe moss. Damp underfoot. Not really bog-moss carpet, except near pools. In low lying areas. Near-Natural.	
23	HU 42256 77113	Dry modified bog. Actively Eroding. Bare peat with areas of common cottongrass. Clearly historically area had bog pools , which had dried out and lost. Erosion features were ca. 0.3-0.5m deep. M17b:M3:Bare peat 60:20:20.	 

TG	Grid	Comment	Photo
24	HU 42157 77124	Erosion feature was ca. 1.5m to 2m deep. Water flowing at base, likely meets with watercourse. Blocks of peat broken off. Hoof prints and dung from sheep visible. Actively Eroding.	
25	HU 42099 77168	Near-Natural blanket bog area with series of pools. M17b:M2 70:30. Potential for these pools to be lost in the manner of surrounding dry modified bog. Currently in Near-Natural condition - Likely actively forming peat, although not full bog-moss carpet. Areas very wet and deep peat. Quaking.	
26	HU 42034 77242	These erosion features may once have been pools and lochans lost through erosion and drying out. would likely have been pools and lochans. Potential for HMP work. DMB: M3:bare peat - Actively Eroding.	
27	HU 41962 77290	M6b flush going though erosion features. Bog-moss carpet, with common cottongrass and common sedge.	
28	HU 41938 77354	Mountain hare seen running across Study Area.	

TG	Grid	Comment	Photo
29	HU 41882 77418	Series of pools with M17b bog around it. In danger of being lost through erosion. Large M6b flush beside it. Not full carpet, but hollows and pools (micro-topology). M17b:M2 70:30 – Near-Natural.	
30	HU 41873 77435	Evidence of active erosion which appears to have resulted in lost pools, blocks of peat broken away. DMB: M3:bare peat - Actively Eroding.	
31	HU 41802 77812	Area of U6 were dominated by heath rush appears to be largely on deep peat. Therefore, it was wet modified bog. Low lying dry heath in a bowl. Perhaps an old peat cutting?	
32	HU 41761 77937	Series of M6b flush lines that were often only ca. 1m to 2m wide. Appeared green with bog-mosses and occasional pools.	 

TG	Grid	Comment	Photo
33	HU 41740 78063	Blanket bog was clearly grazed by sheep. There were hoof prints and dung commonly seen.	
34	HU 41743 78124	U6 on deep peat. Wet modified bog.	
35	HU 41962 78219	This area was dry modified bog, but there were some pools remaining (not all lost). There was also some U6. Appeared to be in the process of being lost and Actively Eroding. Area was Modified with areas Actively Eroding.	
36	HU 42062 78201	Watercourse had a mix of M6b and M6c flush. Stream valley was ca. 5m wide.	
37	HU 42105 78287	The stream valley was made up of H10a:U6:M6b:M6c. There was a line of dead bog-moss after high rains. H10a:U6:M6b:M6c at a ratio of 30:30:20:20.	

TG	Grid	Comment	Photo
38	HU 42016 78283	Many pools and often wet underfoot. M17b:M2 70:30 – Near-Natural.	
39	HU 41865 78310	Landform looks like old peat cuttings, or slips. Fully vegetated.	
40	HU 41714 78345	Wet heath on shallow soils. Abundant heath rush and mat grass though the M15c community.	
41	HU 41574 78233	Small patch of M17b on deep peat flowing down hillside to sea. Area along coast was largely mix of U5 and U6. Many sheep present.	
42	HU 41455 78100	Highly cropped coastal grassland MC10a. Heavily sheep grazed. Adjacent to rocky foreshore. Lots of rubbish along foreshore.	

TG	Grid	Comment	Photo
43	HU 41505 78062	Variable peat depth, in old river valley. M15c:DMB:U6 50:30:20. These communities transition in and out of each other.	
44	HU 41481 77997	MG10a in streambed which was dry.	
45	HU 41445 77886	Dead sheep, plastic bottles and sheep prints in bog pools. Evidence of Modification in M17b.	
46	HU 41565 77788	Example of M6c flush.	
47	HU 41522 77823	Example of M6b flush.	

TG	Grid	Comment	Photo
48	HU 41424 77777	MG10a with water flowing. U6 on sides. Sometime H10a on steep sections. MG10a:U6:H10a at a ratio of 50:40:10.	
49	HU 41279 77672	Old fence line bailed up. In M17b (Modified). Sheep grazed. Deep peat, occasional M6b flush or M2 pool.	
50	HU 41292 77620	Example of M17b relatively lightly Modified blanket bog. Heather and common cottongrass dominated with abundant cross-leaved heath and frequent crowberry, red bog-moss lichens, round-leaved sundew, hare's-tail cottongrass and deergrass. It was often damp underfoot. Sheep present. Few bare peat patches. Occasional bog pools. Bog-mosses were patchy. Woolly fringe moss varied in abundance.	 
51	HU 41266 77434	Erosion feature. Ca. 1m deep and ca. 50m long. Line of DMB:M3 Bare peat. Actively Eroding.	

TG	Grid	Comment	Photo
52	HU 41244 77391	Flush as part of watercourse. Mix M6b and M6c 50:50.	
53	HU 41122 77333	Old, largely revegetated, erosion feature with stream flowing through. Modified and Drained around feature.	
54	HU 41024 77209	View of area beyond boundary fence-line (did not enter) which included a mix of H10a and M17b.	
55	HU 41012 77342	Roadside was U4 and H10a.	
56	HU 41031 77302	1.5 wide concrete line. Likely a pipeline to pumping house. It was ca. 2m from road.	

TG	Grid	Comment	Photo
57	HU 41289 77187	M17b had pools which were drying out. Modified. Pools were poached by sheep. Very patchy bog-moss layer. Most pools had little bog-moss within them.	
58	HU 41481 77197	Old erosion features well vegetated but with likely water flow and dewatering.	
59	HU 41569 77196	H10a with MG10a and U6. Ratio 60 20 20. at base.	
60	HU 41622 77049	M29 characterised by bog pondweed and lesser spearwort. Water trickling through.	
61	HU 41580 76997	At the start of the watercourse there was an M6b flush for ca. 5m then M29 seepage line for ca. 30m.	

TG	Grid	Comment	Photo
62	HU 41570 76958	M25a beside start of watercourse.	
63	HU 41712 76969	Near-Natural blanket bog with bog pools and wet underfoot.	
64	HU 42397 77244	Example of M17b relatively lightly Modified. It was generally wet with an intact surface (few erosion features/drains).	
65	HU 41434 75312	Clear line on map. Perhaps fill from old road. Not a different community, but some soft rush in places and M17b was a bit graminoid rich, thicker and taller than usual M17b. Wet modified bog.	
66	HU 41521 75410	Abundant bog asphodel in M6b flush.	

TG	Grid	Comment	Photo
67	HU 41521 75413	Large area of M17b with occasional pools and old erosion features. The occasional old erosion features were partially or wholly revegetated. Modified.	
68	HU 41557 75482	Example M6c flush.	
69	HU 41615 75526	H10a with a little acid grassland and occasional flushes going though. H10a:U6 at a ratio of 90:10.	
70	HU 41601 75586	Patch of M19a. Very tussocky heather and hare's-tail cottongrass on deep peat at transition of dry heath to the wider M17b blanket bog. Only small area ca. 10m x 20m (not mappable).	
71	HU 41656 75580	On this hill slope there were occasional small (e.g. 5mx5m) patches of M19a mixed in with the M17b. Less than 10% of area.	

TG	Grid	Comment	Photo
72	HU 41711 75698	Old drainage ditch was generally well vegetated. Ca. 0.3m depth visible, but ditch extents to ca. 1m depth below the vegetation. Likely still draining surrounding habitat.	
73	HU 41767 75818	Another well vegetated drainage ditch, with only a change in vegetation to mark it out. However, easily pushed pole in. Some drainage likely.	
74	HU 41765 75904	View from cairn looking north. Shows extensive blanket bog across Study Area, with mix of conditions including pools, erosion features and drainage ditches.	
75	HU 41759 75897	View from cairn looking south. View of pools and erosion features in blanket bog vegetation. Area around cairn was of U6 with many rocks.	
76	HU 42010 75640	Archaeological feature- Chambered cairn?	

TG	Grid	Comment	Photo
77	HU 42038 75578	Monument has U4 grassland enriched from sheep. Largely U6 over outcrops of rocks.	
78	HU 41992 75740	Several bog pools in this area with wet bog-moss carpets around pools. Near-Natural M17b:M2 blanket bog.	
79	HU 41839 75958	Slope of M19a with tussocky of hare's-tail cottongrass, crowberry and heather. Bog-moss present but not abundant. Modified.	
80	HU 41792 76003	Drainage ditch. Ca. 0.5m deep and 0.70m wide. Fully vegetated.	
81	HU 41698 76018	Drainage ditch. Ca. 0.5m deep and 0.70m wide.	

TG	Grid	Comment	Photo
82	HU 41555 76137	Area with a dry modified bog. Clear affinity to M17b and dry heath vegetation. Abundant bell heather and woolly fringe moss. Exposed peat edges were ca. 1m deep. There was usually ca. 1m wide exposed bare peat at base of features. DMB: M3:BP:M17b at a ratio of 50:30:10:10.	
83	HU 41472 76285	Several erosion features running down slope which could be blocked and reprofiled. They were ca. 1m deep and ca. 20m long.	
84	HU 41371 76523	Example line of M6b.	
85	HU 41567 76576	Erosion features bring water downhill and feed wetter area at base of hill slope.	
86	HU 41713 76545	Basin with Near-Natural blanket bog. There were several M2 bog pools and the bog was wet underfoot.	

TG	Grid	Comment	Photo
87	HU 41841 76356	M6c forms much of watercourse at this location. H10a dry heath and U6 acid grassland above and to side.	
88	HU 41955 76411	Water filled drainage ditch with feathery bog-moss. No pools, but wet M17b blanket bog. Ineffectual drainage ditch.	
89	HU 42058 76370	Sluggish watercourse/flush of M6b still at this location included several sedge species including common sedge and star sedge. Biofilm present. Likely the flushes here were once drainage ditches.	
90	HU 42067 76349	Drainage ditch with some M6b.	
91	HU 41997 76330	Small patch (ca. 10m x 10m) M25a wet modified bog. Included autumn hawkbit, hare's-tail cottongrass, common sedge, common bent, bog asphodel, tormentil, and Yorkshire fog.	

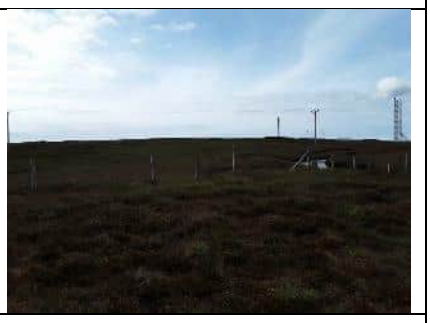
TG	Grid	Comment	Photo
92	HU 42215 76426	Tussocky M19a on edge of watercourse. M6c in stream with H10a and U6 sides.	
93	HU 42396 76367	Area around old croft buildings was a mix of acid grasslands. U4 showed signs of enrichment around the buildings. There was U6 in wetter areas and U5 in drier areas. U6:U5:U4 at a ratio of 50:30:20.	
94	HU 42456 76354	Area dominated by yellow iris. M28.	
95	HU 42445 76300	View of heavily drained area below old croft. Mix of M28 iris and MG10a (50:50).	
96	HU 42472 76323	Water-logged ground dominated by soft rush and abundant Yorkshire fog. MG10a.	

TG	Grid	Comment	Photo
97	HU 42264 76710	M6b with some very small patches of M19a. The wider landscape was M17b.	
98	HU 42296 76818	This area may have been old peat cuttings from the croft. Generally lost sharp edges of peat cuttings, but there were upper and lower areas with a mix of M17b, M19, U6 and H10a depending on slopes/position (60:20:10:10).	
99	HU 42529 76713	Small triangle of acid grassland: marshy grassland (U5:MG10a at a ratio of 50:50) which went into a M6b flush.	
100	HU 42770 76537	Flush of M6c and M6b surrounded by M17b.There were many M6 flushes in this area similar to this one. Perhaps old drainage ditches?	
101	HU 43041 76535	A form of U4 grassland on deep peat. Heavily grazed, Yorkshire fog dominated. Wet modified bog.	

TG	Grid	Comment	Photo
102	HU 43071 76686	View of croft, can see clear lines from peat cutting and drains from crofting practices.	
103	HU 42903 76223	Watercourse widens. Mix of MG10a:U6:U5 at a ratio of 50 30 20. Marsh marigold was in the water.	
104	HU 42823 76038	U5 likely demarking an historic feature.	
105	HU 42607 75684	Example of M17b.	
106	HU 42585 75550	M6c around edge of Neshion Water.	

TG	Grid	Comment	Photo
107	HU 42694 75474	Erosion feature was ca. 1.3m deep and ca. 1.5m wide. Actively Eroding sides. Vegetated base. Dry modified bog at top of feature.	
108	HU 42719 75331	Dry modified bog with M3 and Bare peat and some wetter M17b at the bases. There was clearly active erosion, but also some signs of recovery in places with occasional pools. Features range from ca. 0.3m to 1.5m in depth.	
109	HU 42798 75144	Large erosion features ca. 2m to 3m deep. Base was wet from recent rains. Likely bare peat in drier conditions.	
110	HU 42911 75054	Many M2 pools in this area of M17b. There were also lawns of bog-moss and occasional small bog-moss hummocks. Retained high water table. Near-Natural.	
111	HU 42990 74928	Short heather on shallow soils with common cottongrass frequent and occasional crowberry. H10a.	

TG	Grid	Comment	Photo
112	HU 42683 74945	Mountain hare in M17b.	
113	HU 42123 74985	H10a with patches of U5, U6 and MG10a along watercourse edge. Ratio 50:20:20:10.	
114	HU 41723 75045	Large (ca. 5m x 15m) M3 pool. Bare peat with water over top. Rarely any common cottongrass.	
115	HU 41365 75591	Did not enter beyond fence. Viewed watercourse valley. H10a with MG10a and U4. Ratio 50:40:10.	
116	HU 41379 75620	Along the track there was a mix of dry heath and acid grassland (H10a:U5:U4 at a ratio of 50:25:25). Beside a compound area with a 'keep out' sign (did not enter). Ragwort and perennial sow-thistle in this area.	

TG	Grid	Comment	Photo
117	HU 41396 75052	View of M17b in fenced area occasional pools. Did not enter.	
118	HU 41551 74857	M15c formed over an area where peat had been removed (cut). High abundance of heath rush. Damp underfoot on shallow soils. There were patches of M17b where deep peat remained. Modified. M15c:M17b:M2:U6 ratio 50:30:10:10.	
119	HU 43649 76779	Improved grassland MG6 for hay or silage field.	
120	HU 43358 76902	Nettles (OV24) on silage bags and dumped peat.	

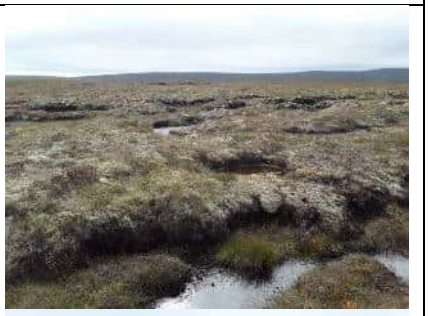
TG	Grid	Comment	Photo
121	HU 43178 76970	Heath rush was frequent in this area of M17b.	
122	HU 41363 73956	Ca. 1m deep peat cutting. U6 at base. Large area of peat removed. M17b and M15c in recovered areas depending on peat depth. Largely M15c.	
123	HU 41398 73954	Drainage ditch. Well vegetated. Not cut recently. Ca. 0.2 dip in ground surface, but no clear effect on surrounding habitat.	
124	HU 41458 73938	Drainage ditch. Well vegetated. Ca. 20cm dip in ground surface. No clear effect on surrounding vegetation but could push walking pole down very easily compared with surrounding ground.	

TG	Grid	Comment	Photo
125	HU 41429 74046	Water flowing along drainage line. Ca. 1m high edge. Perhaps old cutting?	
126	HU 41415 74094	Recent active peat cuttings. Ca. 1m deep. Ca. 10m long. Turf left at base.	
127	HU 41418 74099	Many drainage features. M6b flush vegetation along this line. Flush and drainage lines may be from historic drainage ditch or peat cutting.	
128	HU 41419 74169	Well drained heath and acid grassland on shallow soils Nutrient enrichment from sheep giving U4. U6:H10a:U4:MG10a at a ratio of 40:30:20:10.	
129	HU 41395 74284	Two large bags (ca. 2m x 1m) of polystyrene foam in watercourse. Watercourse largely M6b with H10a sides.	

TG	Grid	Comment	Photo
130	HU 41350 74322	Large (ca. 5m wide) drain around field with M19a and spoil heaped at side with a little of U6.	
131	HU 41339 74352	Very dry M19a with little hare's-tail cottongrass and abundant crowberry. Similar to dry heath. Wet modified bog.	
132	HU 41359 74423	Sheep grazed field of U4 with many tussocks of soft rush. Occasional areas of U6.	
133	HU 41402 74556	Highly modified area where peat has been drained and there was evidence of historic crofting activities. M15c with U6 and occasional M6b flushes. Wet modified bog.	
134	HU 41486 74622	M17b vegetation over what appeared to be deep peat, with common cottongrass and hare's-tail cottongrass but also wavy hairgrass. Old road. Wet modified bog.	

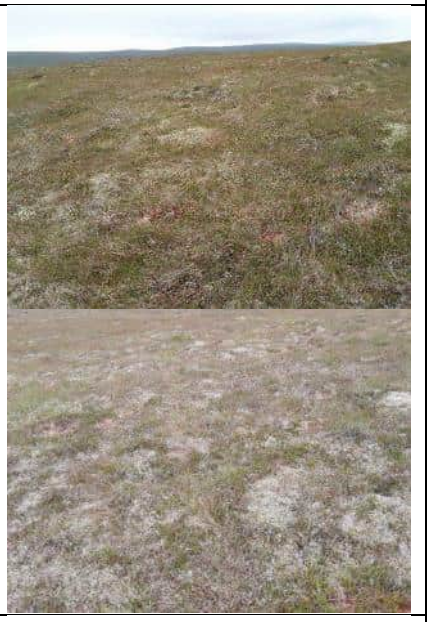
TG	Grid	Comment	Photo
135	HU 41723 74659	Area with erosion features and pools at bases. Dry modified bog. There were also areas with M15c where deep peat appeared to have been historically lost and wet heath vegetation formed over the top. Some areas had eroded down to bedrock. Although, some edges of erosion features were recovering and pools forming. Sheep signs common including dung, wools, and hoof marks. DMB:M15c:M17b:M2:M3 at a ratio of 50:20:10:10:10.	 
136	HU 41751 74693	Actively Eroding erosion feature ca. 1m high island remaining with bare peat around. Bare peat pan was ca. 5m x 30m with common cottongrass (M3) in areas going to U6 or M15c.	 
137	HU 41748 74683	View of Actively Eroding peat pan.	

TG	Grid	Comment	Photo
138	HU 41678 74548	Area of old erosion features or cutting which were almost fully vegetated. H10a on edges depicting the cuttings/features. Modified, but not Actively Eroding. Perhaps drained still. Modified and Drained M17b:H10a at a ratio of 60:40.	
139	HU 41862 74433	Series of pools, but also old drains and cuttings which clearly feed water and sustain the pools. Modified.	
140	HU 41892 74411	Hoofprints. Evident of sheep impact on bog vegetation.	
141	HU 41966 74341	View of expanse of dry modified bog by Sand Water.	

TG	Grid	Comment	Photo
142	HU 42069 74329	Large expanse of dry modified bog. Water draining through to Sand water. Woolly fringe moss dominated. Lots of exposed and Actively Eroding peat.	 
143	HU 42228 74490	M17b. This area has the water from the dry modified bog draining into it. There were occasional pools, but also clear damage from sheep and bare peat patches around them. Modified.	
144	HU 42210 74540	Edge of Sand Water was H10a transitioning into a form of M19a, U5 and U6. The M19a had hare's-tail cottongrass, tussocks of heather, and common cottongrass which was sometime more abundant than hare's-tail cottongrass. There was crowberry, papillose bog-moss and red bog-moss in patches with glittering wood-moss.	
145	HU 42206 74552	Water was peat stained with a stoney and gravel base. Lesser spearwort was around the edge of the water.	

TG	Grid	Comment	Photo
146	HU 42154 74540	Drain and pipe going into Sand Water.	 
147	HU 42284 74686	Peninsula of U4 and U6. Lots of evidence of sheep and geese. Cabbage circle. Edge of water has patches M6c and occasional MG10a.	
148	HU 42501 74826	High flows coming out of pipe into Sand Water. Likely draining bog. Brown stained. In MG10a.	
149	HU 42623 74768	Sand ca. 2m wide at the edge of Sand Water.	

TG	Grid	Comment	Photo
150	HU 42661 74733	Series of erosion features going down slope. Ca. 1m deep.	
151	HU 42664 74665	Series of pools kept wet from surrounding erosion features. Evident of sheep impacts and not full carpet of bog-mosses. Modified (with elements of Near-Natural).	
152	HU 42714 74547	Large area of M6c with pool by small un-named lochan.	 

TG	Grid	Comment	Photo
153	HU 42750 74498	The M17b in the south of the Study Area seems to have more woolly fringe moss and more evidence of sheep than the north side.	
154	HU 42696 74349	There were ca. 1m deep erosion features in the dry modified bog with M3 and bare peat (70:20:10).	
155	Hu 42660 74216	Example of Near-Natural blanket bog M17b:M2.	
156	Hu 42684 74107	Dry modified bog with ca. 30cm to 1m high erosion features. Bare peat and M3 evident. Some pools present. Actively Eroding.	

TG	Grid	Comment	Photo
157	Hu 42598 73986	Watercourse with M19a for ca. 5-10m leading up to the watercourse. Banks of watercourse H10a:U6:MG10a (50:30:20) with occasional yellow iris.	
158	Hu 42682 73845	Blanket bog habitat to edge of Bordigarth Water.	
159	Hu 42463 73665	M17b to edge to edge of Bordigarth Water, although small line of U6 (ca. 2m wide) at some locations.	
160	Hu 42406 73697	Likely old drainage ditch ca. 1.2m deep and 1m wide. Eroded and natural looking, but straight. Flowing at time of survey.	
161	Hu 42326 73762	Fence ca. 1m off ground with erosion features around it. Field is U4 with soft rush in tussocks.	

TG	Grid	Comment	Photo
162	Hu 42239 73896	U4:MG10a:U6 at a ratio of 40:30:30.	
163	Hu 42082 73953	Dry heath with a thin line of U5 going through it. Likely from a drain or underground cable.	
164	Hu 41925 73992	Large area of historic peat cuttings. Largely revegetated. M17b:M15c:U6:H10a at a ratio of 60:20:10:10. Drier areas were H10a with U6 at some bases, M15c on shallow soils and M17b where deep peat remained.	
165	Hu 41715 73933	Cuttings more visible at this location. Similar to previous target note with a little enrichment from sheep.	
166	Hu 42787 73603	Dry modified bog with water filling bases of erosion features. M3 and bare peat present.	

TG	Grid	Comment	Photo
167	Hu 42828 73662	Marshy grassland with MG10a and U6 (50:50). An old structure visible.	
168	Hu 43054 73730	Fence in dry modified bog with pools and erosion features beside it.	
169	Hu 43046 73552	Dry heath beside a small M6b watercourse. Erosion along sides was ca. 0.5m to 1m deep.	
170	Hu 42581 77536	Example erosion feature in dry modified bog. Ca 1m deep some M3 and bare peat.	
171	Hu 42426 77569	Small patches of M19a on at this location. Too small to map.	

TG	Grid	Comment	Photo
172	Hu 42178 77878	Small watercourse with U5:U6:M6b at a ratio of 40:30:30.	
173	HU 41962 78205	Mixture of DMB:M6:M3:M2. Some bog-moss filled pools others Actively Eroding. Transition between Near-Natural and Actively Eroding.	
174	HU 41368 77794	Deep stream valley (ca. 5m deep sides) U6:U5 at a ratio of 80:20.	
175	HU 42290 75674	M6b flushes and bog pools at head of stream. Surrounded by relatively lightly Modified M17b. Bog asphodel abundant.	
176	HU 42337 75800	Possible old peat cutting. Ca 10m x 20m. Mix of H10a and M17b at base.	

TG	Grid	Comment	Photo
177	HU 42249 75886	Hummocks of hare's-tail cottongrass with heather, wavy hairgrass, common cottongrass, sweet vernal grass, heath rush, crowberry, tormentil, papillose bog-moss, woolly fringe moss, red bog-moss and glittering wood-moss in M19a vegetation. Thick moss layer.	
178	HU 42233 75921	Drainage ditch. Ca. 0.3m wide and 0.2-0.3m deep. Fully revegetated.	
179	HU 42159 75965	Heavily grazed area of low dry heath with many graminoids. Mosaic of H10a:U6:M19a 50:30:20.	
180	HU 42199 76051	Drainage ditch. Ca. 0.3m wide, and 0.2m deep. Revegetated.	
181	HU 42329 76279	Large area of historic peat cuttings. Ca. 0.5m deep. Vegetation at base and top but bare peat exposed and Actively Eroding in places.	
182	HU 42447 75436	Neshion Water. MG10a:M6c beside lochan. Bog-moss carpet was ca. 50% cover.	No photo.

TG	Grid	Comment	Photo
183	HU 42762 74655	Heavily eroded dry modified bog. Erosion features ca. 1m deep. Bare peat was ca. 30-40% cover at this location.	
184	HU 42909 74581	Deep erosion feature with watercourse. Banks of H10a. Ca. 2-3m deep.	
185	HU 43021 74510	Extensive area of dry heath H10a.	
186	HU 42987 74318	Example of dry modified bog.	
187	HU 43000 74233	M6c Flush/pool at edge of dry modified bog.	

TG	Grid	Comment	Photo
188	HU 42775 73937	Watercourse with MG10a, U6, and H10a. There were occasional areas of M28 with U5 at base.	

APPENDIX C3
PROTECTED TERRESTRIAL MAMMAL SURVEY REPORT

Neshion Energy Park Protected Terrestrial Mammal Survey Report: 2023-2024

Alba Ecology Ltd.

January 2025

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Summary

Alba Ecology Ltd. was commissioned by Neshion Ltd. to conduct a protected mammal survey for a proposed energy park development site (the 'Proposed Development') at Neshion, by Sullom Voe on Mainland Shetland. Protected mammal surveys were undertaken to assess the likelihood of the presence of otter (*Lutra lutra)* and mountain hare (*Lepus timidus*) in 2023-2024.

Evidence was recorded across the Study Area of use by otters. Some areas were noted as being more heavily used and more important than others. With an active holt recorded at the western coastal edge of the Site Boundary. This would suggest that part of the Study Area is regularly used by otter.

Mountain hares were recorded regularly across the Study Area, with two areas where higher incidence and activity levels were recorded. These areas were at the northern Site Boundary and in a central area, around 200-300m north of Sand Water, where a large amount of breeding behaviour was observed.

The results are discussed, and recommendations made in relation to informing potential constraints. Should the Proposed Development proceed, a Species Protection Plan will need to be developed (as per NatureScot standing advice) that considers potential construction impacts on otters and mountain hares.

Introduction

Alba Ecology Ltd. was commissioned by Neshion Ltd. to conduct a protected terrestrial mammal survey for a proposed energy park development site (the 'Proposed Development') at Neshion, by Sullom Voe on Mainland Shetland. All terrestrial land mammals in Shetland are non-native species in Shetland, of which two species are specially protected. Consequently, protected terrestrial mammal surveys were undertaken to assess the likelihood of the presence of otter (*Lutra lutra)* and mountain hare (*Lepus timidus*) in 2023-2024.

The Study Area (Figure 1) included the Site Boundary plus a 200m buffer and was characterised by undulating hill terrain (averaging around 60m above sea level (a.s.l.)) e.g. Photo 1. The habitat was largely made up of open heath and grassland. The primary land use for the Study Area was sheep grazing.

***Photo 1**. Illustrative photograph of Study Area habitats from Hill of Garth looking towards Sand Water, Nugla Water and Loch of Bordigarth.*

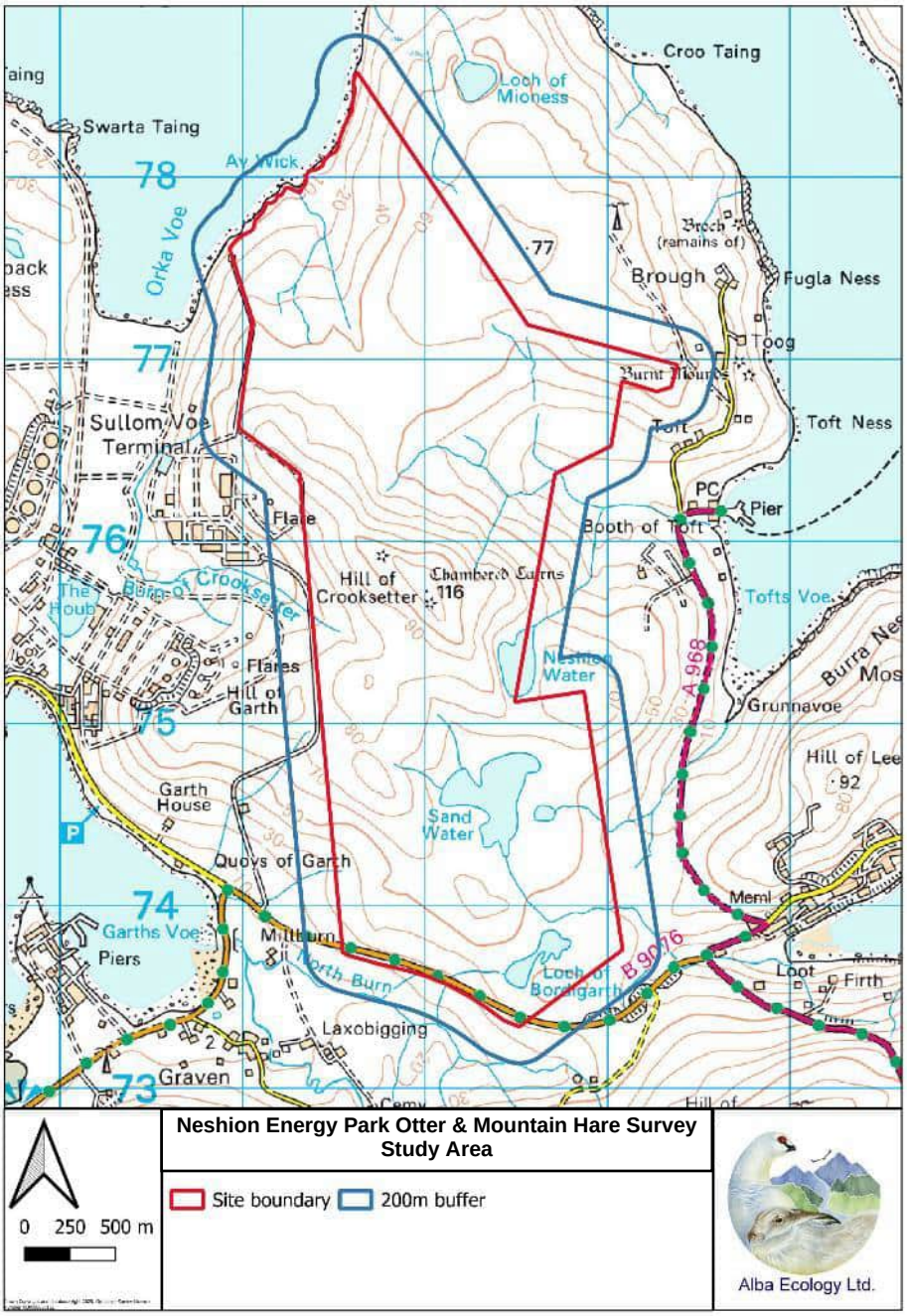

Figure 1: *Map showing the Neshion Energy Park Protected Terrestrial Mammal Study Area.*

This document reports on the findings of protected terrestrial mammal surveys, focussed on otter and mountain hare, undertaken in the Study Area by highly experienced Alba Ecology surveyors during 2023 and 2024.

Methods

Experienced ecologists Donald Shields (MCIEEM) and Dr Peter Cosgrove (FCIEEM) surveyed all potentially suitable habitats for otter and mountain hare within the Study Area in 2023 and 2024. The location of each mammal sign was recorded, representative photographs were taken and a note made along with an OS grid reference using a hand-held Garmin GPS.

The key recommended survey methods and references are listed in Table 1 followed by summary details of the relevant survey methodology and legal protection.

Species	Main survey methods	Key references
Otter	Walkover survey of riparian habitat looking for places otters use for shelter, resting and protection (such as couches, lying-up sites and holts), or for signs of activity (such as slides or spraints).	Chanin, 2003. Standing advice for planning consultations - Otters | NatureScot.
Mountain hare	Walkover survey for signs and visual sightings across whole Study Area (not sample transects as per guidance), i.e. survey coverage was more comprehensive than sample transects. Nocturnal mountain hare transect surveys using spot-lamping during the autumn (sometimes recommended) not undertaken.	The Mammal Society, 2012. Standing advice for planning consultations - Mountain Hare | NatureScot.

Table 1: *Key otter and mountain hare survey methods.*

Target Species

The following accounts summarise the legal protection afforded to otters and mountain hares. The informal, plain English nature of these summaries mean that they cannot be substituted for the actual legislation, its amendments or its subordinate Orders, Licences and Regulations and we therefore urge it to be used with care. Where a formal detailed or definitive answer on legal protection is needed, this requires the opinion of a qualified lawyer and reference to the original published legislation. In the case of potential licensing, specialist advice from NatureScot should be sought.

An important consideration, not addressed in the NatureScot standing guidance (nor CIEEM best practice guidance), is that both otter and mountain hare are non-native in Shetland, despite being native in much of the rest of Scotland. There is plenty of government policy, advice and guidance around non-native species e.g. the GB Non-Native Species Secretariat, which was brought in on the back of various bits of legislation (mostly focussed on *invasive* non-native species) to help coordinate action and to disseminate information.

Consequently, undertaking or recommending management supporting non-native species (both otter and mountain hare in this case) could reasonably be argued to be against government policy and guidance. The NatureScot standing guidance on Biodiversity

Enhancement for developers on these species is predicated on these species being native; not the situation in Shetland. According to CIEEM biodiversity enhancement or net gain is an approach to development that '*leaves biodiversity in a better state than before'*. Would carrying out biodiversity enhancement in support of non-native species in a locality such as Shetland be deemed to leave biodiversity in a '*better or worse state than before'*? Regardless of the answer to this question, and the apparent conflict within the guidance, the legal protection afforded to these species appears, from examples of other development work in Shetland, to take precedence over their non-native status in Shetland.

Otter

The otter is listed on Appendix 1 of CITES, Appendix II of the Bern Convention and Annexes II and IV(a) of the EC Directive 92/43/EEC (the Habitats Directive). The Habitats Regulations state that the otter, as a European Protected Species, has been given special protection and it is an offence to deliberately capture, kill or disturb the otter, or to damage or destroy a breeding or a resting site of the otter. The otter gains further protection under Schedule 6 of the Wildlife & Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act 2004.

Otter surveys were conducted during suitable weather conditions (during and after prolonged periods of several days of dry weather), following standard survey guidance (Table 1). This gave a reasonable period of prolonged low water, so that otter signs (spraints, latrines etc.) would have had time to build up and not get washed away. All watercourses/waterbodies and their riparian habitats within the Study Area were systematically surveyed for otters.

Surveyors walked the stream corridors searching for otter signs including holts, other resting sites, spraints and tracks for otters. A search was made of potential otter spraint sites such as elevated features including grass tussocks, peat haggs and rocks. Muddy and sandy areas were checked for otter footprints. Suitable cover includes rock piles, areas of dense vegetation and banks suitable for digging were checked for the presence of holts or other resting sites. In addition, the coastal areas of the Study Area were searched for signs of otter.

Mountain hare

Since 2021, mountain hares have been protected by the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- kill, injure or capture a mountain hare;
- disturb a mountain hare in its place of shelter;
- damage, destroy or obstruct access to a mountain hare's place of shelter.

This means that if mountain hares could be affected in these ways by a development, and no action is taken to prevent it, an offence may be committed. The advice below will help ensure that impacts on mountain hares are minimised and no offences occur.

Results

Most of the Study Area was relatively easy to survey, with exceptions being some areas at the coastal cliffs. Where these were present, binoculars were used to examine these inaccessible areas. For the avoidance of doubt, surveyors did not enter the Sullom Voe compound along the western buffer edge. Consequently, survey coverage of the proposed Site Boundary was considered excellent.

Otter

In 2023-2024 several of otter spraints, an active holt and potential couches were recorded along the main watercourses and waterbodies within the Study Area (e.g. Photos 1-4). Evidence of feeding was also recorded (Photo 4).

Location	Sign/potential feature
HU 41605 78394	Feeding remains
HU 41581 78305	Possible couch
HU 41582 78266	Possible couch
HU 41582 78266	Spraint
HU 41582 78274	Possible couch
HU 41026 77671	Spraint
HU 40940 77604	Spraint
HU 40940 77604	Holt
HU 41312 77881	Spraint
HU 42553 73998	Spraint
HU 42083 74630	Spraint
HU 42290 74635	Spraint
HU 42299 74676	Feeding remains
HU 42902 77221	Spraint

Table 2: *Otter signs and potential features recorded in the Study Area in 2023-2024.*

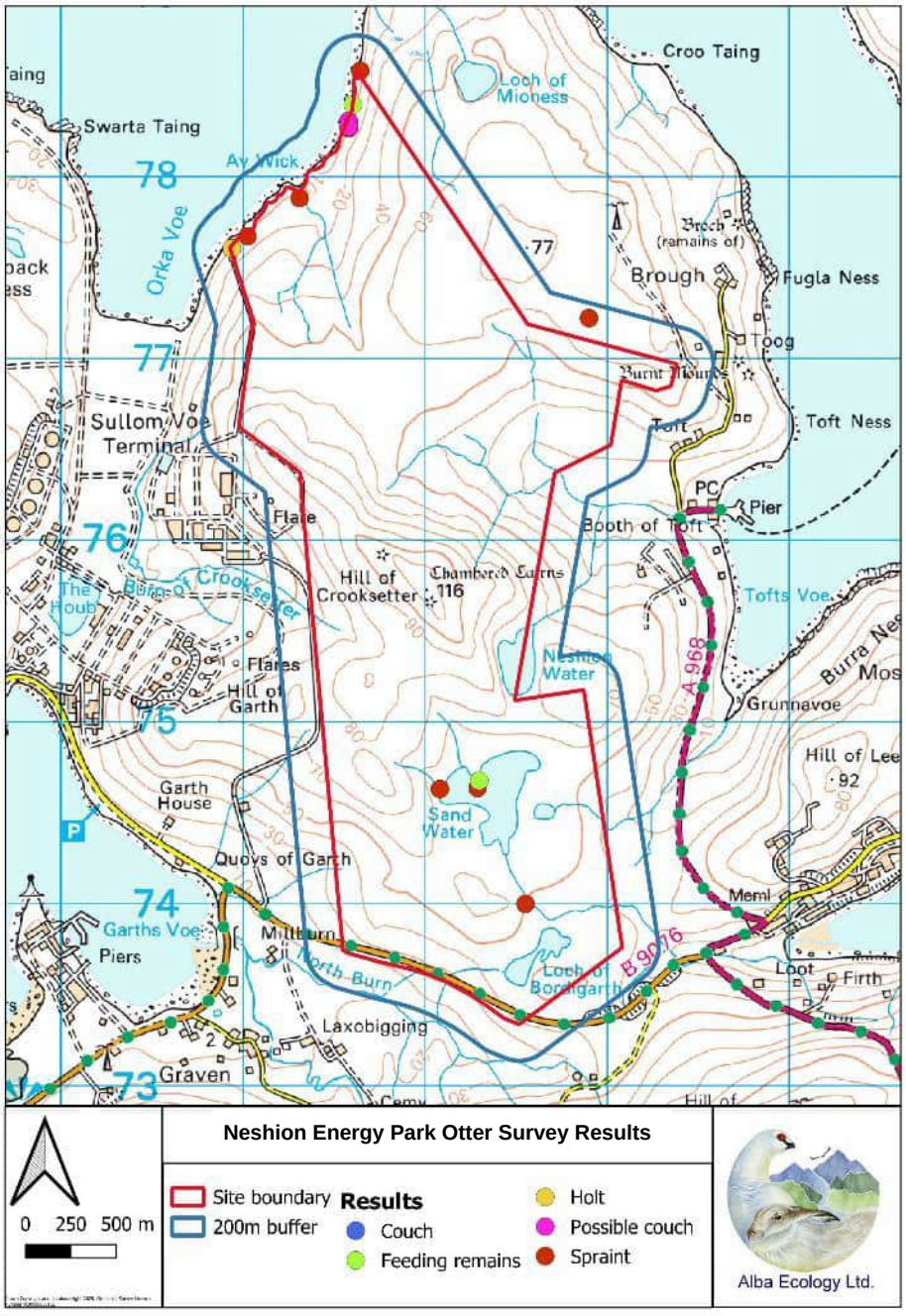

Figure 2: *Results of otter survey at Neshion, 2023-2024.*

Photo 1: *Active otter holt at HU 40940 77604.*

Photo 2: *Spraints at HU 41582 78266.*

Photo 3: *Otter spraint at HU 42553 73998.*

Photo 4: *Feeding remains next to otter spraint.*

Mountain hare

Mountain hares were recorded regularly across the Study Area, usually being flushed either from underfoot or nearby during 2023-2024. Signs of mountain hare (droppings, scrapes) were recorded but could easily be confused with those of European rabbits (*Oryctolagus cuniculus*) which were also present within the Study Area.

Two parts of the Study Area had a notably higher incidence of sightings of mountain hare. most being recorded within 200-300m of the northern side of Sand Water and at the northern edge of the Study Area (Figure 3). This was breeding behaviour, with several males pursuing females in both 2023 and 2024. In one case mating was observed in the Study Area in 2023.

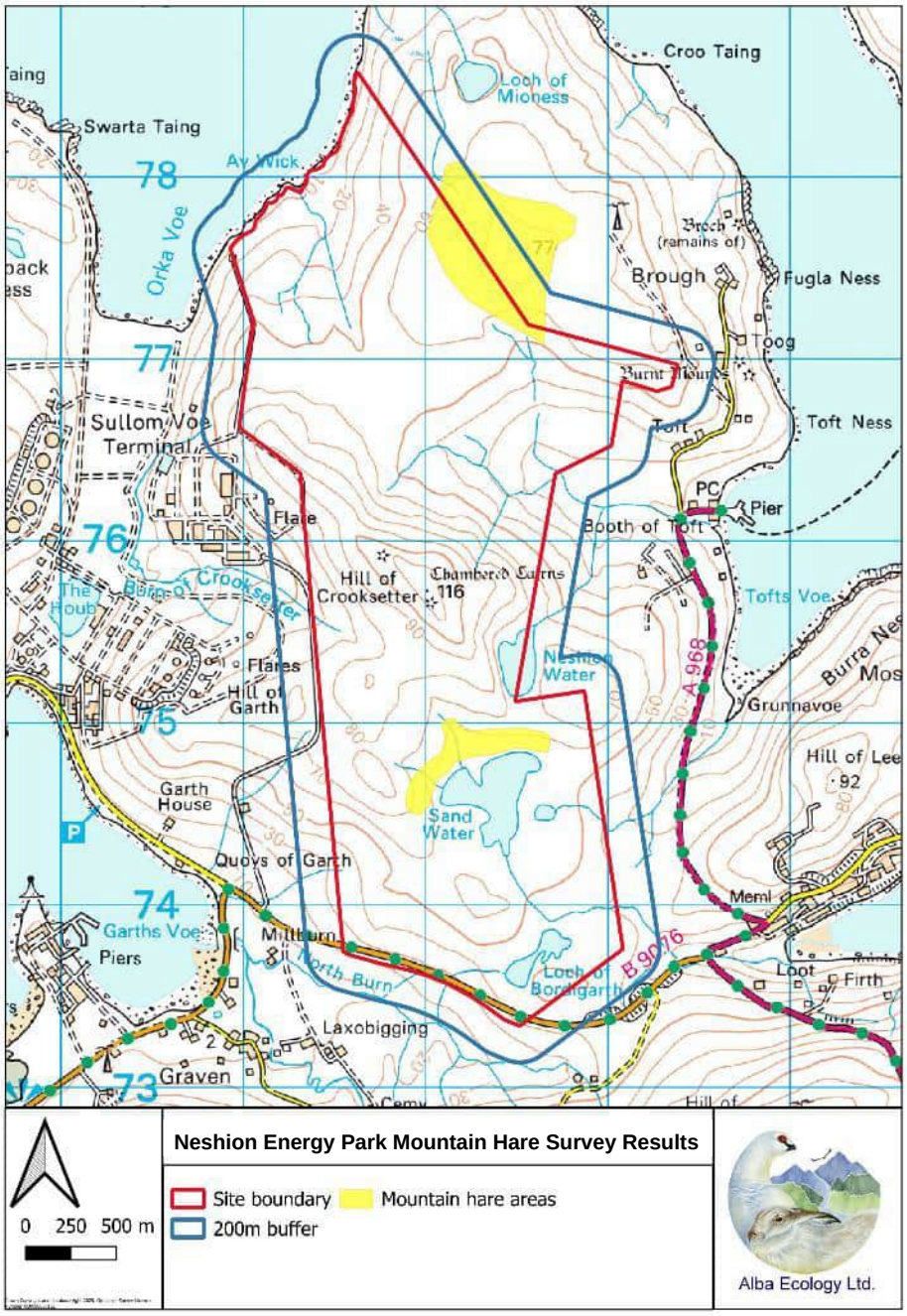

Figure 3: *Areas of high mountain hare occurrence/activity.*

Other terrestrial mammal species

European rabbits were frequently recorded.

Discussion

The main limitations of this survey are recognised to apply to most ecological surveys. The surveys undertaken in the Study Area were sampling techniques, not absolute censi. Results give an indication of numbers and activities of species at the particular times that surveys were carried out. Species occurrence changes over time; so, the results presented in this report are

snapshots in time (specifically 2023-2024 spring-summer). Nevertheless, surveys were undertaken during the period of the year when otter and mountain hare activity would likely be high. Repeated walkover surveys, which were undertaken, provide greater confidence in the findings than a single one-off survey.

A small portion of the Study Area was inaccessible due to coastal cliffs, though this was able to be surveyed by the use of binoculars from the top of the cliffs. Consequently, survey coverage was considered to be excellent.

Otter

The presence of signs of otter recorded within the Study Area were largely restricted to the watercourses/waterbodies. The highest proportion of signs recorded were in the coastal areas of the north-western edge of the Site Boundary. This included spraints, feeding sites, couches and an active holt. This suggests that there is a resident otter(s) in the area and that the coastal areas are the most important for them. The relatively small number of spraints, feeding signs and potential couches within the central parts of the Study Area suggest that while they sometimes utilise these parts of the Study Area, it is not necessarily important for them.

The location of the otter holt at HU 40940 77604 is outwith the Yell Sound Coast Special Area of Conservation (SAC) (https://sitelink.nature.scot/site/8409), of which otter is a qualifying feature, by approximately 100-200m. However, given the evidence of otters all along the coastal areas of the Site Boundary, much of which falls within the SAC, it is reasonable to assume that the otters utilising the active holt are associated with and functionally linked with the SAC.

Due to the confirmed presence of resident otters within the Study Area, a pre-construction otter survey should be conducted before any construction work commences and the results should be used to inform, and where necessary update the potential constraints map and related technical plans and documents. Should the proposed development proceed, an Otter Species Protection Plan will need to be developed (as per NatureScot standing advice) that considers potential construction impacts on otters.

Mountain hare

According to NatureScot's standing guidance on mountain hares: "*If mountain hares are confirmed as present on a development site, a licence to disturb them and destroy resting places is likely to always be required before any work on site can commence, irrespective of the season*" (Standing advice for planning consultations - Mountain Hare | NatureScot). Consequently (and apparently regardless of its non-native status in Shetland), a NatureScot licence will be required for construction work to go ahead.

Whilst Figure 3 highlights areas of relatively high abundance during 2023-2024, mountain hare populations demonstrate large fluctuations or population cycles with an average periodicity of none years (range four-fifteen years). Population density can change more than ten-fold over such a cycle (Newey *et al*., 2007). Therefore, it is important to recognise that the areas of

relatively high density recorded during 2023-2024 survey may not necessarily reflect future abundance patterns.

It is not clear from NatureScot's standing guidance on mountain hares if potential licensing elements, such as undertaking compensation or enhancement measures for this non-native species in Shetland will be required or not. Based on non-native species policy and guidance, carrying out compensation or enhancement measures for such a species in a Shetland context could be seen as against government biodiversity policy and guidance and so it is recommended that this issue and any such compensation or enhancement measures are discussed and agreed with NatureScot before submitting a licence to disturb application.

As a Schedule 5 species it is illegal to 'Intentionally or recklessly damage, destroy or obstruct access to any structure or place which mountain hare uses for shelter or protection, or to disturb one when it is occupying a structure or place for that purpose' (Standing advice for planning consultations - Mountain Hare | NatureScot). It seems likely, given the relatively high abundance of mountain hares in parts of the Study Area in 2023-2024 that avoiding any structure or place which mountain hare uses for shelter or protection would likely be difficult and such scenarios should be considered during licensing discussions with NatureScot. In short, licensing to both disturb and damage and destroy structure or place which mountain hare uses for shelter or protection are likely to be required.

References

Chanin, P. 2003. *Monitoring the Otter Lutra lutra.* Conserving Natura 2000 Rivers Monitoring Series No.10. English Nature, Peterborough.

CIEEM. 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

NatureScot. Standing protected species advice (hyperlinks earlier in document) accessed: January 2025.

NatureScot. Sitelink protected areas (hyperlinks in document) accessed: January 2025.

Newey, S., Willebrand, T., Haydon, T., Dahl., Aebischer, N.J., Smith, A.A and Thirgood, S.J. 2007. *Do mountain hare populations cycle?* Oikos 116: 1547-1557.

The Mammal Society, 2012 (eds. Cresswell, W.J., Birks, J.D.S., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. *UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation*. Southampton: The Mammal Society.

APPENDIX D
COMAH SITES MAJOR ACCIDENT SCENARIOS AND CONTROL MEASURES

Table D1: Summary of COMAH Sites Major Accident Hazards, Major Accident Scenarios and Control Measures

Establishment	Major Accident Hazards	Major Accident Scenarios	Control Measures
Sullom Voe Oil Terminal	Explosion Fire Release of dangerous substances	Explosion. Levels of blast overpressure which may be harmful to humans and animals and damage buildings. Projectiles travelling at high speeds may also spread from the explosion presenting a risk to people, animals and damage buildings. Explosions may also initiate fires. Fire. Ranges from an intense fire lasting several seconds to large fires lasting several minutes or hours. Potential for fire damage to people and the environment and fires may spread to other areas, a drifting cloud of flammable gas may ignite. Fires may generate smoke clouds which may lead to breathing difficulties and deposition of soot on property and vegetation. Liquid release. Liquid flowing on-site and off-site to sewer, freshwater, estuarine waters, coastal waters, land or groundwater. Damage to people and the environment. Environmental pollution and contamination of drinking water supplies Release of contaminated fire water containing dangerous substances - to sewer, freshwater, estuarine waters, coastal waters, land or groundwater. Toxic gas or smoke. A gas cloud or smoke plume (includes ecotoxic smoke) containing dangerous substances.	• Access to the site is strictly controlled; • Air pollution prevention systems are in place; • Air quality monitoring systems are in place; • All of the establishment's storage tanks, process vessels, pipework and control systems are designed and maintained to prevent major accidents; • Arrangements are in place for regular safety inspections of plant and processes; • Arrangements are in place to ensure all employees have the necessary skills and competencies to do their job and deal with any emergencies that arise; • Arrangements are in place to inform, instruct, train and supervise the workforce; • Arrangements are in place to monitor, track and improve health and safety systems; • Arrangements are in place to prevent or minimise loss of containment of dangerous substances; • Buildings on site are designed and arranged to prevent or minimise knock-on effects of an incident; • Chemical spillage prevention systems are in place; • Containment systems are in place for relevant work areas to minimise the loss of spilled material to the environment; • Detectors are in place to alert managers of any loss of containment; • Emergency response systems & procedures are in place; • Establishment carries out maintenance and inspection to keep equipment in good working order; • Establishment has a detailed way of working with policy, operating standards and a Health, Safety and Environmental

Establishment	Major Accident Hazards	Major Accident Scenarios	Control Measures
			management system to maintain and improve safety and environmental performance; • Establishment has an automatic/manual fire alarm system connected to a central monitoring station and/or the fire service; • Establishment has facilities for extraction and ventilation of flammable materials to prevent them causing fires and explosions; • Establishment has facilities to detect and manage releases of gases that may have harmful effects; • Establishment has facilities to detect releases of gases and has taken steps to minimise the chance that any releases are ignited; • Establishment has on-site response facilities to reduce the impact of an incident; • Establishment has taken steps to deal with severe weather conditions; • Good communication systems are in place, internally and with outside agencies to prevent/mitigate major accidents; • Incompatible materials are segregated and stored separately; • Isolation procedures are in place to prevent or reduce the extent of an incident; • Key operating units and storage facilities are fitted with automatic shutdown and isolation systems; • Key operating units and storage facilities have containment systems in place to keep chemicals and firewater on-site; • Key operating units and/or relevant warehouses/storage facilities are fitted with fire detection and/or suppressant and/or protection systems; • Overpressure prevention systems are in place as necessary; • Procedures are in place to control the activities of contractors or visitors to the site; • Procedures are in place to manage any changes at the site that could impact on health, safety and the environment;

Establishment	Major Accident Hazards	Major Accident Scenarios	Control Measures
			• Procedures are in place to select, use and manage appropriate equipment; • Procedures are in place to identify and manage deviations from normal operating conditions; • There is elimination of all potential ignition sources to protect against the ignition of flammable material; and • Traffic management arrangements are in place.
Shetland Gas Plant	As above	As above.	As above. • Air pollution prevention systems are in place; • Air quality monitoring systems are in place; • Arrangements are in place to prevent or minimise loss of containment of dangerous substances; • Establishment has facilities for extraction and ventilation of flammable materials to prevent them causing fires and explosions; and • Key operating units and storage facilities have containment systems in place to keep chemicals and firewater on-site.