8 Ecology and Nature Conservation

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8 Ecology and Nature Conservation

8.1 Executive Summary

8.1.1 An assessment of terrestrial ecology effects arising from the construction and operation of the Proposed Development was undertaken and is presented, based on the current Proposed Development layout and turbine dimensions.

8.1.2 Following consultation with OIC, SNH and SEPA, a range of ecological studies were undertaken, to identify the terrestrial ecological interests of the Proposed Development and to establish the ecological baseline for the ecological impact assessment (EcIA). This included identification of existing wildlife records and nearby sites designated for nature conservation (compiled for the desk study) and survey of the habitats and faunal interests of the site. The following field surveys were undertaken:

- habitats: both Phase 1 habitat survey and Preliminary (bat) Roost Assessment (PRA); and
- otter.

8.1.3 The primary habitats (listed in order of size) identified on site are currently:

- improved grassland;
- arable;
- hard standing roads and tracks;
- intertidal boulders/rocks;
- running water; and
- standing water.

8.1.4 A number of small waterbodies are present within the Study Area, including a man-made waterbody outwith the site boundary and a number of small rain fed ephemeral pools and an area of potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) wet heath was identified within the Study Area, but outwith the site boundary and over 600 m from the nearest site infrastructure.

8.1.5 The desk study identified the presence of otter within the site and records of brown hare, a single hedgehog, a single unidentified bat and cetacean species within the 2 km survey buffer.

8.1.6 Through a standardised evaluation method, Important Ecological Features (IEFs) were identified and brought forward for assessment. In agreement with OIC's Scoping Opinion, no sites designated for nature conservation were identified as being at risk from the Proposed Development and designated sites were subsequently scoped out of further consideration. The only IEF taken forward for assessment is otter.

8.1.7 Potential impacts of the construction and operation phases are presented, prior to the assessment. In line with guidelines, the impact assessment process assumes the application of standard mitigation measures. With these in place, predicted effects were considered to be barely perceptible and therefore not significant. Although likely effects were not assessed as being significant, some additional mitigation measures are proposed for otter to further minimise any adverse effects. With further mitigation detailed, residual impacts for both construction and operation phases are considered to have barely perceptible adverse and therefore not significant effects.

8.1.8 Likely cumulative effects of nearby developments, consented or at application stage, were also considered; no significant cumulative effects are anticipated.

8.1.9 The assessment concludes that there will be no significant adverse effect on any of the terrestrial ecological interests of the site, resulting from the construction, operation and decommission of the Proposed Development.

8.2 Introduction

8.2.1 This chapter sets out the methods used to describe and evaluate the non-avian ecological interests within the Study Area of the Proposed Development. It documents the baseline conditions and includes an assessment of the likely effects of the Proposed Development on ecological features above a certain value, and defines mitigation and compensation measures where significant effects are predicted. Ornithological features are described and assessed in Chapter 7: *Ornithology*. The effects on hydrology are addressed in Chapter 11 *Geology, Peat, Hydrology and Hydrogeology*.

8.2.2 This chapter has been authored by ITPEnergised (ITPE) and is supported by baseline data provided within the following technical appendices:

- Appendix 8.1 – Phase 1 habitat survey (including a Preliminary Roost Assessment) and Desk Study; and
- Appendix 8.2 – Otter (*Lutra lutra*) survey.

8.2.3 The "Study Area" for the ecological surveys in this assessment included a 250 m radius buffer beyond the site boundary.

8.2.4 The specific objectives of the chapter are to:

- describe the ecological impact assessment (EcIA) methodology and criteria used to make the assessment;
- describe the ecological baseline conditions;
- describe the likely effects of the Proposed Development, including direct, indirect and cumulative effects;
- describe the mitigation measures proposed to address any significant effects prior to assessing the impacts; and
- assess any residual effects.

8.2.5 The assessment has been carried out in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM) by Mikael Forup (BSc (Hons), PhD Restoration Ecology; CEnv, FCIEEM) an ecologist with over 15 years' experience.

8.3 Legislation, Policy and Guidelines

Legislation

8.3.1 Relevant legislation and guidance documents have been reviewed and taken into account as part of this ecological assessment. Of particular relevance are:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the "Habitats Directive");
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Ramsar Convention 1975;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland) (the "Habitats Regulations");
- The Conservation of Habitats and Species Regulations 2010 (as amended); The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (the "WANE Act"); and

- Nature Conservation (Scotland) Act 2004 (as amended) (the "NCA").

Planning Policy

8.3.2 Chapter 5 of the EIA Report provides an overview of all the relevant planning policy. Of particular relevance to this chapter are:

- National Planning Framework 3 (Scottish Government, 2014);
- Scottish Planning Policy (SPP; Scottish Government, 2019); and
- Orkney Local Development Plan (Orkney Islands Council, 2017).

8.3.3 Planning Advice Note (PAN) 60: Planning for Natural Heritage provides guidance relevant to this assessment and the Proposed Development.

Guidance

8.3.4 Further key guidance documents relating to the assessment of effects of wind farms on terrestrial (non-avian) ecological receptors that have been referenced in this assessment include the following:

- The Scottish Biodiversity List (SBL; Scottish Government, 2013);
- The Orkney Local Biodiversity Action Plan (LBAP) (Orkney Islands Council, 2018);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);
- Good Practice during Wind Farm Construction 4th Edition (SNH, 2019);
- Planning for development: What to consider and include in Habitat Management Plans (SNH, 2016); and
- Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2017).

8.3.5 Where appropriate, more detail relating to specific legislation, guidance or policy is provided in the corresponding Technical Appendix for each specialist input supporting this chapter (i.e. Technical Appendices 8.1 to 8.2).

8.4 Methods

8.4.1 This section identifies the 'key ecology and nature conservation issues' which have been considered as part of the Ecological Impact Assessment, describes the methods used to establish baseline conditions and assess the magnitude and significance of the likely ecological effects of the Proposed Development.

Consultation

8.4.2 Table 8.1 provides details of consultations undertaken with relevant stakeholders, together with action undertaken by the Applicant in response to consultation comments.

Table 8.1 - Scoping Opinion Relevant to Non-avian Ecology

Consultee	Consultee Comments	Applicant Action
Orkney Islands Council (OIC)	The proposed development area is on low-lying land adjacent to the coastline which is crossed by drainage ditches. There are also freshwater ponds on site. Otters are therefore likely to be present and these could be affected by the	As described in Section 8.5, a full otter survey was undertaken at the site.

Consultee	Consultee Comments	Applicant Action
	proposal, especially during the construction and decommissioning phases. An otter survey should be undertaken of the development area and surrounding fields, to determine otter usage and any species licencing requirement.	
	Bats are known to be present in the nearby village of Finstown and may forage in and around the proposed development area and should also be considered in the EIA.	As described in Section 8.5, a Preliminary Roost Assessment (PRA) was undertaken of any structures and trees within the site and bats have been considered as part of the assessment.
	The Keelylang Hill and Swartaback Burn SSSI is designated because of both its habitats and its bird species. Whilst the proposed development appears unlikely to impact the habitats of the SSSI, effects on its breeding bird assemblage should be considered in the EIA.	Impacts on ornithological features are assessed in Chapter 7.
Scottish Natural Heritage (SNH)	Keelylang Hill and Swartaback Burn SSSI is designated for both habitat and bird species. From the information provided in the application it is unlikely that there is connectivity with the upland assemblage habitat feature of the SSSI.	Impacts on ornithological features are assessed in Chapter 7. An assessment of the SSSI is included within this chapter.
	West Mainland Moorland SSSI is designated for both habitat and bird species. From the information provided in the application, it is unlikely that the blanket bog and upland assemblage habitat will be affected by the proposal.	Impacts on ornithological features are assessed in Chapter 7. An assessment of the SSSI is included within this chapter.
	Otters may be present in the area due to the locality of the proposal close to the coast. Otters could be affected by any construction/decommissioning works, the need for an otter survey should be considered by the applicants.	As described in Section 8.*5,* a full otter survey was undertaken at the site.
	Bats are also recorded in the nearby village of Finstown, and should also be considered in the EIA.	As described in Section 8.5, a PRA was undertaken of any structures and trees within the site and bats

Consultee	Consultee Comments	Applicant Action
		have been considered as part of the assessment.
Scottish Environment Protection Agency (SEPA)	SEPA welcomes that an extended Phase 1 habitat survey will be undertaken and that If any localised wetland habitats are identified at the site, then those habitats will be subject to a National Vegetation Classification (NVC) survey.	Extended Phase 1 Habitat survey was completed n included as part of this assessment. Ephemeral, rainwater fed ponds are present in the Study Area, no associated wetland with semi-natural vegetation were recorded. An area of wet heath is present in the Study Area, south of the public road and 680 m from the nearest turbine and 630 m from the nearest proposed track. This is well outside the zone of potential impact (SEPA, 2017). An NVC survey was therefore not undertaken.

8.5 Assessment Methodology and Significance Criteria

Desk Study

8.5.1 An ecological desk study was undertaken that included obtaining data from third parties is presented as part of Appendix 8.1. This data was used to confirm the presence of any statutory and non-statutory nature conservation sites and legally protected or otherwise notable species within 2 km of the site, but with the search buffer extended to 10 km for bat roosts.

Site Visit

8.5.2 The Study Area within which the field surveys were undertaken covered the site and a 250 m survey buffer and are further described and presented in the corresponding Appendix and associated Figures, as referenced in Section 8.1.1 above.

Evaluation Methods for Ecological Features

8.5.3 Table 8.2 lists the criteria used to determine the value of ornithological features in a geographical context.

Table 8.2 – Geographical Evaluation Criteria

Scale of Ecological Value	Criteria	Examples
International	Nature conservation resource, i.e. designated	International nature conservation areas:

Scale of Ecological Value	Criteria	Examples
	nature conservation area, habitat or populations of species, of international importance. N.B. For designations, such as a Special Area of Conservation (SAC), this may also include off-site features on which the qualifying population(s) or habitat(s) are considered, from the best available evidence, to depend.	– Any SAC; – Any candidate SAC (cSAC); and – Any Ramsar wetland. Significant numbers of a designated population outside the designated area. A site supporting more than 1% of the EU population of a species.
National (Scotland)	Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of national importance. N.B. For designations, such as a Site of Special Scientific Interest (SSSI) or a National Nature Reserve (NNR), this may also include off-site features on which the qualifying population(s) or habitat(s) are considered, from the best available evidence, to depend.	National nature conservation areas: – Any SSSI or NNR designated for biological feature(s). A site supporting more than 1% of the UK population of a species. Nationally important population/assemblage of a European Protected Species (EPS) or species listed on Schedule 5 of the WCA.
Council area (Orkney)	Nature conservation resource, i.e. nature conservation designation, habitat or species, of importance on a council area scale.	Statutory and non-statutory nature conservation designations: – Any Local Nature Reserve (LNR); – Any Local Nature Conservation Site (LNC);Any Scottish Wildlife Trust (SWT) reserve; and – Any Local Biodiversity Site (LBS). A council area-scale important population / area of a species or habitat listed on the Scottish Biodiversity List (SBL) (Scottish Government, 2013) as requiring conservation action.

Scale of Ecological Value	Criteria	Examples
		A council area-scale important population/area of a species or habitat listed on the local Biodiversity Action Plan (local BAP). A council area-scale important population/assemblage of an EPS or species listed on Schedule 5 of the WCA.
Local (i.e. within 2km of the site)	Nature conservation resource, e.g. a habitat or species of importance in the context of the local district.	A breeding population of a species or a viable area of a habitat that is listed in a Local BAP because of its rarity in the locality. An area supporting 0.05-0.5% of the UK population of a species. A breeding population of a species on the SBL. All breeding populations of EPS or Schedule 5 species.
Less than local	Unremarkable, common and widespread habitats and species of little/no intrinsic nature conservation value.	Common, widespread, modified and/or impoverished habitats. Common, widespread, agricultural and/or exotic species.

8.5.4 Where a feature qualifies under two or more criteria, the higher value is applied to the feature.

8.5.5 In this EcIA chapter any ecological feature of local or higher value is considered an Important Ecological Feature (IEF).

Impact Assessment Methods

8.5.6 The approach to the Ecological Impact Assessment (EcIA) follows the Chartered Institute of Ecology and Environmental Management guidelines (CIEEM, 2018), which prescribe an industry-standard method to define, predict and assess likely ecological effects to a given proposed development. Starting with establishing the baseline through a mix of desk study and field survey, key ecological features (the IEFs) are identified and those requiring assessment established through a reasoned process of valuation and consideration of factors, such as statutory requirements, policy objectives for biodiversity, conservation status of the IEF (habitat or species), habitat connectivity and spatial separation from the proposed development. From this stage, these features are assessed for impacts with the assumption of this being in the presence of construction industry-standard mitigations to ameliorate impacts as far as practicably possible. Additional mitigation strategies can then be determined to minimise any residual impacts that would otherwise be experienced by the IEF and any opportunities for enhancement identified.

8.5.7 In summary, the impact assessment process (CIEEM, 2018) involves:

- identifying and characterising impacts and their effects;
- incorporating measures to avoid and mitigate adverse impacts and effects;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects; and

- identifying opportunities for ecological enhancement.

Ecological Zone of Influence

8.5.8 The Ecological Zone of Influence (EZoI) is defined as the area within which there may be ecological features subject to effects from the Proposed Development. Such effects could be direct, e.g. habitat loss resulting from land-take or removal of a building occupied by bats, or indirect, e.g. noise or visual disturbance causing a species to move out of the EZoI. The EZoI was determined through:

8.5.9 Review of the existing baseline conditions based on desk study results, field surveys and information supplied by consultees:

- identification of sensitivities of ecological features, where known;
- the outline design of the proposed development and approach to construction; and
- through liaison with other technical specialists involved in the assessment, e.g. hydrologists and noise specialists.

Temporal Scope

8.5.10 Likely impacts on ecological features have been assessed in the context of how the predicted baseline conditions within the EZoI might change between the surveys and the start of construction. Characterising Ecological Impacts and Effects

8.5.11 In accordance with the CIEEM guidelines, the following definitions are used for the terms 'impact' and 'effect':

- Impact – Actions resulting in changes to an ecological feature. For example, the construction activities of a Development removing a hedgerow; and
- Effect – Outcome to an ecological feature from an impact. For example, the effects on a species population from loss of a hedgerow.

8.5.12 In accordance with the CIEEM guidelines, when determining impacts on IEFs, reference is made to the following:

- Beneficial or adverse – i.e. whether the impact has a beneficial or adverse effect in terms of nature conservation objectives and policy;
- Magnitude – i.e. the size of an impact, in quantitative terms where possible;
- Extent – i.e. the area over which an impact occurs;
- Duration – i.e. the time for which an impact is expected to last;
- Timing and frequency – i.e. whether impacts occur during critical life stages or seasons; and
- Reversibility – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible.

8.5.13 Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action but affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. fencing of a development site may cause scrub to invade marshy grassland.

8.5.14 For the purposes of this assessment, the predicted impacts on ecological features are categorised as 'no impact', 'barely perceptible, 'low', 'medium' or 'high', based on the definitions in Table 8.3, below.

Table 8.3 – Levels of impact

Level of impact	Definition
No impact	No detectable impacts on the ecological resource, even in the immediate term
Barely perceptible	Detectable impact but reversible within 12 months. Not expected to affect the conservation status of the nature conservation designation, habitat or species under consideration
Low	Detectable impacts, and may be irreversible, but either of sufficiently small scale or of short-term duration to have no material impact on the conservation status of the nature conservation designation, habitat or species population
Medium	Detectable impact on the status of the nature conservation designation, habitat or species population in the medium term but is reversible / replaceable given time, and not a threat to the long-term integrity of the feature
High	Irreversible impact on the status of the nature conservation designation, habitat or species and likely to threaten the long-term integrity of the feature. Not reversible or replaceable. Will remain detectable in the medium and long term
The following definitions have been applied in respect to timescales: Immediate: Within approximately 12 months; Short term: Within approximately 1-5 years; Medium term: Within approximately 6-15 years; and Long term: More than 15 years.	

8.5.15 The magnitude of any impact on IEFs has been categorised according to the criteria outlined in Table 8.3, which is based on a table presented in the CIEEM (2018) guidelines. It should be noted that the concept of 'integrity' refers to coherence of ecological structure and function and includes both temporal and spatial considerations.

Determining Ecologically Significant Effects

8.5.16 An EcIA is undertaken in relation to the baseline conditions that would be expected to occur in the absence of a proposed development and, therefore, may include possible predictions of future changes to baseline conditions, such as environmental trends and other completed or planned development. Both adverse and beneficial impacts/effects are possible.

8.5.17 A significant effect, in ecological terms, is defined as an effect (whether adverse or beneficial) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area, including cumulative and in-combination impacts.

8.5.18 In accordance with the CIEEM guidelines, the approach adopted in this chapter aims to determine if the effect of an impact is significant or not based on a discussion of the factors that characterise it, i.e. the ecological significance of an effect is not dependent on the value of the feature in question. Rather, the value of a feature that will be significantly affected is used to determine the geographical scale at which the effect is significant.

8.5.19 In accordance with the current CIEEM guidelines, effects of impacts are assessed in the presence of standard mitigation measures. Additional mitigation may be identified where it is required to reduce a significant effect.

8.5.20 Any significant effects remaining post-mitigation (the residual effect), together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against legislation, policy and development control in determining the application.

8.5.21 In addition to determining the significance of effects on valued ecological features, this chapter also identifies any legal requirements in relation to wildlife.

Limitations to Assessment

8.5.22 The surveys were undertaken at appropriate times of year, under favourable survey conditions and generally with full access to the majority of the Study Area. The section of the survey buffer north of the site was open sea, as such this area was assessed from the shoreline using binoculars where necessary. In addition one transect of the habitat required modification, due to agricultural management of part of the area. As such, no significant limitations were identified.

8.6 Baseline Conditions

8.6.1 This Section of the report details the results of the desk study and field surveys conducted across the site and respective Study Areas, which provides the baseline conditions from which the impact assessment is based. This includes:

- designated sites and desk study/external data;
- habitats and vegetative communities; and
- protected species.

Desk Study

Nature conservation designations

8.6.2 There are two designated sites located within 5km of the site that have ecological qualifying features. Details of these are provided within Table 8.4 and Figure 8.1. No non-statutory designations (for non-avian considerations) were recorded within 2 km of the site.

8.6.3 For the purposes of brevity, all features presented here are relevant to terrestrial ecology. Records pertinent to ornithological interests are included within Chapter 7: Ornithology.

Table 8.4 – Designated Sites within 5 km of the Proposed Development

Site	Designation	Distance to Site	Non-ornithological Reasons for Designation
Keelylang Hill and Swartaback Burn	SSSI	1.76 km SW	Habitats: Upland mosaic
West Mainland Moorlands	SSSI	4.58 km NW	Habitats: Blanket bog
Wideford Hill	LNC	0.1 km S at closest point	Habitats: Unspecified, likely upland habitats.

Protected or otherwise notable species

8.6.4 Data provided by the Orkney Wildlife Information and Records Centre (OWIRC) include records of a number of protected or otherwise notable species from locations within 2 km of the site boundary and dating from within the last 10 years, as summarised in Table 8.5.

Table 8.5 – Records of Protected or Otherwise Notable Species from within 2 km of the Site

Common Name	Scientific Name	Legal / Conservation Status	Records
Brown hare	*Lepus europaeus*	Wildlife and Countryside Act 1981 (as amended) SBL Orkney LBAP	Nine records of brown hare have been identified within 2 km of the site boundary all recorded on Wideford Hill 1.5 – 2 km south and recorded in 2013.
Hedgehog	*Erinaceus europaeus*	Wildlife and Countryside Act 1981 (as amended) SBL (watching brief only) LBAP	A sole record of hedgehog has been identified; it was located 2 km south of the site boundary and recorded in 2013.
Otter	*Lutra lutra*	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). SBL LBAP	Two records of otter have been identified: One record of an individual otter recorded on the north-western boundary of the site dates from 2010, and another 1.3 km west of the site boundary (on Damsay) that dates from 2013.
Killer whale	*Orcinus orca*	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) SBL LBAP	A sole record of killer whale from a location 1.94 km east of the site boundary dates from 2013.
Common dolphin	*Delphinus delphis*	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) SBL LBAP	A sole record of common dolphin from a location 0.2 km north-west of the site boundary dates from 2011.
White-sided dolphin	*Lagenorhynchus acutus*	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) SBL LBAP	A sole record of white-sided dolphin from a location 0.99 km west of the site boundary dates from 2011.
Bat species	Chiroptera species	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)	A single record of a 'bat species' was identified within 2 km of the site boundary; the record was from a location 2 km east of the

Common Name	Scientific Name	Legal / Conservation Status	Records
		SBL LBAP	site and dates from 2017. In addition a bat roost was identified in an unspecified location in Finstown, Firth approximately 4.5 km west of the site, Evie approximately 10 km north-west and on the island of Shapinsay, 6 km north-east.

Field Surveys

Habitats

8.6.5 The results of the extended Phase 1 habitat survey are outlined in this Section and shown on Figure 8.2, which illustrates the location and extent of habitat types recorded within the site boundary and 250m survey buffer. For a full description of the Phase 1 habitat survey results, please refer to Technical Appendix 8.1. A total of twelve habitats, including two boundary features, were recorded within the Study Area. Table 8.6 presents the cover of each habitat.

Table 8.6 - Area Cover of site and Study Area Phase 1 Habitats

Phase 1 Habitat Code	Phase 1 Habitat Description	Extent in site (ha)	Extent in Study Area (ha)
B4	Improved grassland	150.24	226.93
J1.1	Arable	15.67	15.86
H1.2/1.3	Intertidal boulders/rocks	2.51	4.66
J5	Other – hard standing roads and tracks	2.05	5.63
G2	Running water	0.63	0.63
G1	Standing water	0.27	0.94
J5	Other – Sea	-	81.26
D2	Wet heath	-	4.22
B2.2	Semi-improved grassland	-	2.51
A2.1	Continuous scrub	-	0.79
J3.6	Buildings	-	0.55
J2.1.2	Intact species-poor hedgerow	-	-

Phase 1 Habitat Code	Phase 1 Habitat Description	Extent in site (ha)	Extent in Study Area (ha)
J2.4	Fence	-	-

8.6.6 A description of the Phase 1 habitats recorded within the Study Area is presented below: for full descriptions, scientific names and target notes please refer to Appendix 8.1 and Figure 8.2.

Improved grassland

8.6.7 The majority of both the site and the 250 m survey buffer to the west, south and east comprises improved grassland used for livestock grazing (both cattle and sheep). The grassland comprises distinct fields separated by post and wire fencing and some fields were noted as being heavily poached due to intense grazing and trampling. The dominant grass species recorded were perennial rye-grass and meadow-grass. Common grassland species such as white clover, creeping thistle, common nettle, and creeping buttercup, were all frequently recorded in these fields.

Arable

8.6.8 Two arable fields were recorded in the north-east of the site, both were strips of turnip and winter crops such as winter barley.

Intertidal boulders/rocks

8.6.9 The northern perimeter of the site is made up of a shoreline which comprises small rocky cliffs (maximum 5 m) and gently sloping shingle and rocks beaches.

Other – hard standing roads and tracks

8.6.10 A grassed-over track was noted in three locations in the site, as well as south to farm buildings in the 250 m survey buffer. A busy main road, the A965, follows the southern perimeter of the site. An area of hard standing with dumped building material was recorded directly north of the A965.

Running water

8.6.11 Two drainage ditches run from south to north through the site. Both ditches are approximately 0.5 m wide and are heavily overgrown with broad-leaved dock, meadowsweet, bracken and semi-improved grassland as described above.

Standing water

8.6.12 A large man-made 'duck pond' was recorded 50 m west of the site boundary. The pond measures 30 m by 80 m with three shooting hides on the shoreline. There was little recorded vegetation within the pond with the pond bottom being noted as pebbles.

8.6.13 A number of small rainwater fed, ephemeral pools were present throughout the site and 250 m survey buffer, with the majority recorded in the north-west. These smaller pools were noted as having little vegetation other than grassland species in the areas they were recorded and were heavily poached by cattle trampling.

8.6.14 The majority of the pools have little ecological value however the large man-made pond provides a resource not only for bird species such as wildfowl but also as a foraging area for otter and a habitat for fish and invertebrates.

Other – sea

8.6.15 The majority of the 250 m survey buffer north of the site is open sea making up the south of Wide Firth.

Wet heath

8.6.16 There is no wet heath within the site, but a small area of this habitat was noted in the south-western of the 250 m survey buffer on the slopes of Wideford Hill. The dominant species recorded was heather with purple moor-grass, common cotton grass, soft-rush and bogmoss species also frequently recorded. Wet heath is a potential GWDTE habitat (SEPA, 2017).

Semi-improved grassland

8.6.17 An area of semi-improved grassland was recorded off the north-western site boundary, where it surrounds a man-made waterbody. The grassland is fenced off from livestock. The dominant grass species were Yorkshire fog and tufted hair-grass. Soft-rush, meadowsweet, silverweed, creeping buttercup and white clover were all locally frequent.

Continuous scrub

8.6.18 A section of dense gorse borders wet heath in the south-west of the 250 m survey buffer.

Buildings

8.6.19 There are no structures within the site, although some small sections of mono-block wall are present. The only structures within the 250 m survey buffer are storage sheds and a stone cottage and out-buildings.

Intact species-poor hedgerow

8.6.20 A section of gorse hedgerow was noted in the southwest of the site. The hedgerow runs above a drainage ditch as described above.

Fence

8.6.21 Post and wire fencing was noted crossing all of the site and 250 m survey buffer and is used for managing the livestock.

Species

Otter

8.6.22 As described in Technical Appendix 8.2 and shown on Figure 8.3 otter spraints were identified during the otter survey on the track north of the A965 within the site boundary, on a field boundary at the north of the site boundary, on a concrete drainage channel to the west of the site boundary and around the edge of the pool located to the west of the site boundary. No holts or hovers were identified within the site boundary and 250 m survey buffer.

8.6.23 The habitats within the site have limited suitability for otter although are used by this species to commute between foraging grounds. Sections of the Study Area, most notably the coastline are optimal foraging habitat for otter providing a number of suitable prey species such as crabs and fish. The evidence indicates that the site is part of an active otter territory.

Bats

8.6.24 As described in Technical Appendix 8.1 no structures or trees suitable for roosting bats were recorded within the site and two groups of farm buildings were noted south of the A965 between 20-100 m south of the site, both noted as having negligible suitability for roosting bats. The site itself was noted as providing sub-optimal foraging habitat for bats, with few linear features such as hedgerows, tree lines and water courses although the coastline following the north of the site was noted as having limited suitability for commuting bats. The nearest bat record from the desk study was 2 km from the site and the nearest recorded bat roosts located 4.5 km west from the site.

Brown hare

8.6.25 Brown hare was observed on the site during the extended Phase 1 habitat survey, and noted as using the areas of grassland at the field edges for foraging and shelter. The grasslands that border

the arable fields can be used as commuting routes for this species and the expanse of open land allows for them to escape predation.

Grey and harbour seal

8.6.26 Seals were not observed during the extended Phase 1 habitat survey. However, the intertidal area and sea north of the site was noted as suitable foraging and resting habitat for the seals.

8.7 Evaluation of Recorded Features

8.7.1 Table 8.7 below provides a summary of the level of importance of each of the recorded features.

Table 8.7 - Summary of Evaluation of Ecological Features

Feature	Rationale for evaluation	Level of Importance
Keelylang Hill and Swartaback Burn SSSI	The value of a statutory designation corresponds to its level of designation.	National
West Mainland Moorlands SSSI	The value of a statutory designation corresponds to its level of designation.	National
Wideford Hill LNC	The value of a statutory designation corresponds to its level of designation.	Council
Improved Grassland	This habitat is considered as a locally important habitat within the Orkney LBAP as an important breeding resource for wading birds such as curlew, snipe, lapwing, oystercatcher and redshank. The impacts on the loss of breeding habitat is considered with Chapter 7: Ornithology. This habitat is considered of low non-ornithological ecological value and is therefore assessed as of Less than local ecological value.	Less than local
Arable	Arable fields are considered to be a common and widespread habitat which is not a conservation priority on either the SBL or Orkney LBAP priority and is therefore assessed as of Less than local ecological value.	Less than local
Intertidal boulders/rocks	Maritime cliff and slopes are a SBL habitat. The section of intertidal rocks and boulders along the northern edge of the site represents a suitable habitat for foraging otters and resting seals and is therefore assessed to be of Local ecological value.	Local
Other – hard standing roads and tracks	Areas of hard standing are considered to have no ecological value and are therefore assessed as of Less than local ecological value.	Less than local

Feature	Rationale for evaluation	Level of Importance
Running water	Two small sections of overgrown ditches are considered to be a common and widespread habitat which is not a conservation priority on either the SBL or Orkney LBAP priority value and is therefore assessed as of Less than local ecological value.	Less than local
Standing water	The majority of the pools within the Study Area have little ecological value being heavily poached by the presence of cattle liable to drying out in hot weather and have little range of plant species within them. However, the large man-made pond provides habitat for fish and invertebrates and therefore resources for foraging otters and it is assessed as having Local ecological value.	Local
Sea	As a habitat for a wide range of sea mammals, fish and flora the sea north of the site is considered of high ecological value but given that it is locally very widespread it is considered of Local ecological value in the assessment.	Local
Semi-improved grassland	This habitat is considered as a locally important habitat within the Orkney LBAP as an important breeding resource for wading birds such as curlew, snipe, lapwing, oystercatcher and redshank. The impacts on the loss of breeding habitat is considered with Chapter 7: Ornithology. This habitat considered of low non-ornithological ecological value and is therefore assessed as of Less than local ecological value.	Less than local
Continuous scrub	This scrub habitat considered to be a common and widespread habitat which is not a conservation priority on either the SBL or Orkney LBAP priority and is therefore assessed as of Less than local ecological value.	Less than local
Wet heath	Wet heath is a priority habitat on both the SBL and the Orkney LBAP. Wet heath is not present within the planning boundary but within 250 m of the boundary. Wet heath is a potential GWDTE habitat (SEPA, 2017) and is the only habitat within the Study Area considered to be a potential GWDTE. As such it is considered of Local ecological value in the assessment.	Local

Feature	Rationale for evaluation	Level of Importance
Buildings	The stone buildings may have some limited value for roosting bats but, given the surrounding habitat and the low density of bats in Orkney, buildings are considered to be of Less than local ecological value.	Less than local
Fence	Post and wire fences are considered to have no ecological value and is therefore assessed as of Less than local ecological value.	Less than local
Intact species-poor hedgerow	A small section of gorse hedgerow is considered to be a common and widespread habitat which is not a conservation priority on either the SBL or Orkney LBAP priority and is therefore assessed as of Less than local ecological value.	Less than local
Otter	Otter is an EPS and is a priority species on the SBL and Orkney LBAP. Otters are considered to use the site to commute between foraging areas within the wider area, such as the sea directly north of the site and the large man-made pond west of the site. No holts or hovers were recorded within the Study Area although suitability habitat for the creation of resting places was noted along the coastline meaning this area could be used for resting places in the future. Given the presence of otter within the site and wider area otter are considered as being of Local value.	Local
Bats	Bat species are also EPS and are a priority species on the SBL and Orkney LBAP. Bats are concluded not to be roosting within the Study Area, but there is some potential for commuting and/or foraging activity along the coast to the north of the site, although activity is likely to be limited. As such, in relation to the Proposed Development and in the context of the site, bats are assessed as being of Less than local value.	Less than local
Brown Hare	As an SBL-listed species confirmed to be present within the site and wider Study Area, brown hare is of local importance; however, the majority of the site is heavily poached fields with little cover for hares meaning the site will not support a significant population and so this species is considered to be of Less than local level value.	Less than local
Grey Seal	As Annex 2 and Orkney LBAP species likely to be present in the Study Area, seals are considered to be	Less than local

Feature	Rationale for evaluation	Level of Importance
	of local importance; however, the site itself will not support any seals and the Study Area is likely only to support a limited number of these species and is typical habitat for the area and are therefore considered to be of Less than local level value.	
Harbour Seal	As Annex 2 and Orkney LBAP species likely to be present in the Study Area, seals are considered to be of local importance; however, the site itself will not support any seals and the Study Area is likely only to support a limited number of these species and is typical habitat for the area and are therefore considered to be of Less than local level value	Less than local

8.8 Receptors Brought Forward for Assessment

8.8.1 As noted in Section 8.4, above, ecological features of local and higher value are considered IEFs. Due to a range of factors, some IEFs of local or higher value can also be scoped-out of further consideration.

Scoped Out IEFs

Designated Sites

8.8.2 Keelylang Hill and Swartaback Burn SSSI and West Mainland Moorlands SSSI have been scoped-out because their geographical distances from the site (1.76 km and 4.58 km, respectively) mean there is a lack of connectivity between the designated habitat features and the site. Wideford Hill LNC is closer to the Proposed Development but the distance from the nearest infrastructure (630 m), the physical separation of the site by a busy main and the physical lie of the land (the sites lies downhill) mean there is a lack of connectivity between the designated habitat features and the site.

Species

8.8.3 The following species have been scoped out of further assessment due to level of importance as described above and summarised in Table 8.7):

- bats;
- brown hare;
- grey seal; and
- harbour seal.

Habitats

8.8.4 Adverse impacts on habitats within the site will occur and will include direct losses, e.g. permanent land-take for turbine foundations and other infrastructure, temporary land-take for the construction site compounds as well as temporary disturbance of habitats within and adjacent to works areas and at the temporary construction compound. Adverse impacts on habitats can also be indirect, e.g. through changed hydrological conditions, and disrupted grazing levels and habitat fragmentation.

8.8.5 Despite the restoration of temporary loss areas, and taking a precautionary approach, it is assumed for the assessment that the areas of land-take for infrastructure also represent permanent losses of habitat due to the complexities in re-creating habitat types.

8.8.6 For the purposes of this assessment it is assumed that habitat losses due to indirect drainage effects may extend out to a precautionary 10 m from infrastructure. It is expected that any indirect drainage effects would only impact wetland habitats at the site, such as wet heath, which lie over 600 m from the nearest infrastructure. As such, no indirect drainage impacts are expected to effect or alter the quality or composition of habitats associated with dry substrates, which are the only type expected to be lost as a result of the Proposed Development. For clarity, Table 8.8 presents the areas of habitat loss by habitat type.

Table 8.8 - Summary of Habitat Lost to Proposed Development Footprint

Broad habitat (Phase 1 code)	Permanent loss during operation (ha)	Temporary loss during construction (ha)
Continuous scrub (A2.1)	n/a	n/a
Semi-improved grassland (B2.2)	n/a	n/a
Improved grassland (B4)	10.1	11.5
Wet heath	n/a	n/a
Standing water (G1)	0.05	0.05
Running water (G2)	n/a	n/a
Intertidal boulders/rocks	n/a	n/a
Arable (J1.1)	1.53	1.53
Intact species-poor hedgerow	n/a	n/a
Fence	n/a	n/a
Buildings (J3.6)	n/a	n/a
Other – Sea (J5)	n/a	n/a
Other – hard standing roads and tracks (J5)	1.07	1.07
Total	**12.7**	**14.1**

8.8.7 Based on the above calculations habitats have been scoped out of further assessment as follows:

- Wet heath is located 50 m south of the site boundary and over 650 m from the nearest turbine location and 630 m from nearest access track, on the opposite side of the busy main road, the A965, and there will be no direct impacts on the feature. The distance also makes the habitat buffered from any construction disturbance impacts. Drainage pathways are not expected to be altered by construction of the tracks which will be on the opposite side of the busy main

road, the A965. It is concluded that there will be no impact on this feature of local importance; this habitat is therefore scoped-out of any further consideration within the assessment.

- Intertidal boulders/rocks follow the northern edge of the site and are approximately 100 m from any Proposed Development infrastructure which is sufficient to buffer the habitat from construction disturbance impacts. It is concluded that there will be no impact on this feature of local importance; this habitat is therefore scoped-out of any further consideration within the assessment.
- Standing water: a number of ephemeral pools are located within the site which are considered to be of low ecological value. The only section of standing water to be considered of moderate ecological value is the man-made pool which supports species such as fish and wildfowl. This larger pool is located outside the site and approximately 250 m away from any deep excavations such as turbines and 100m away from any shallow excavations such as access tracks. There is no link to this feature and the proposed works and therefore this habitat is scoped-out of any further consideration within the assessment.
- Sea: this component is all out with the site and over 100 m from the Proposed Development infrastructure and is sufficiently buffered from construction impacts.
- Dry habitats: the remaining habitats (i.e. improved grassland, arable land and hard standing)) all lie on dry substrates and, as such, are therefore not considered to be susceptible to hydrological connectivity. These habitats are all considered to be of less than local value and are therefore scoped out of further consideration within the assessment.

Scoped In IEFs

8.8.8 Based on the above only one IEF is brought forward for detailed assessment in relation to the Proposed Development, otter.

8.9 Standard Mitigation

8.9.1 In line with the current CIEEM guidelines, the assessment of likely effects is carried out in the presence of standard mitigation measures. In the event of consent the following mitigation will be implemented.

Design Mitigation

8.9.2 During the design process, the following decisions have been implemented to reduce the potential for impacts on IEFs:

- Existing tracks have been used, where possible, in order to reduce the footprint of the Proposed Development and to limit the number of watercourse crossings as far as practicable. Some localised upgrading may be required to ensure a minimum 4.5 m running width, with local widening on corners.
- The presence of potential GWDTEs has informed the site layout, which has maximised distances to such features as far as possible (see above). The only potential GWDTEs were recorded in the south-west of the Study Area and was located over 250 m from the nearest turbine and over 100 m from the closest access track meaning they are not a potential constraint to the development.
- Electrical infrastructure cabling will be installed alongside tracks, wherever possible, to further minimise habitat loss.
- Turbines have been sited at least 50 m from standing water and watercourses.

Good Practice Mitigation

8.9.3 The following good practice and mitigation measures will be applied to the Proposed Development during construction to ensure that likely effects on the IEFs are reduced:

- A suitably qualified Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of any construction activities take place. The ECoW will be present and oversee construction activities as well providing toolbox talks to all site personnel with regards to priority species and habitats, as well as undertaking monitoring works and briefings to relevant staff and contractors as appropriate.
- In order to prevent pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed.
- Full details of construction mitigation measures will be provided in a Construction Environment Management Plan (CEMP) to be agreed with OIC, in consultation with SNH and SEPA, post-consent but prior to development commencing.

8.10 Likely Effects

Construction

8.10.1 Otters rely on the aquatic environment, although they will also track across watercourse catchments within their territories. The potential noise and vibration impacts of constructional activities could change otter behaviour and cause otters to avoid areas within their ranges for the duration of the disturbance event. However, once the disturbance is complete, or the animals concerned have habituated to the disturbance, use of the habitat will likely resume at the same level. The majority of otter activity will be animals foraging or commuting along the coast and around the large man-made waterbody, all of which is outside the site and away from construction activity. There were spraints recorded within the site indicating that otters do on occasions commute across the site, although this activity is likely to be at night and unlikely to be in directly conflict with construction activity. As no otter resting places were recorded within the site and immediate surrounds and otters only use the site for commuting the impacts on otter during construction would constitute an immediate and adverse barely perceptible effect and likely only locally significant over a very temporary timescale.

8.10.2 Otters are also potentially vulnerable to mortality or injury due to collision with construction traffic or construction methods, e.g. large mobile plant stripping the surface and falling into deep excavations. Given the fact that otter are more active at night the probability of collisions occurring is considered to be low, however given even a single mortality would constitute an offence and additional mitigation measures, such as speed limits and the provision of exit ramps from excavation works, are outlined below and will be put in place to reduce this risk further. There would therefore be an immediate **low** and reversible adverse impact on otter which is a **non-significant effect** at the local area scale.

Operation

8.10.3 Avoidance behaviour is not expected to be an issue, as otter will become accustomed to the new infrastructure and background noise caused by turbine operation (i.e. the new Proposed Development site baseline conditions). The only potential issue for otters during operation is the possible collision with maintenance vehicles but as stated above given otters nocturnal behaviour around humans it is unlikely to be a significant issue.

8.10.4 Operational impacts of the Proposed Development on the behaviour of otter in this area are considered to be a **barely perceptible adverse** impact and **not a significant effect**.

Decommissioning

8.10.5 The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan.

8.11 Additional Mitigation and Enhancement

8.11.1 In the event of consent the following additional mitigation measures for otter will include:

- Development of an otter-specific protection plan.
- Pre-construction otter survey to establish if there have been any significant change in the status of otter on site and within 250 m since the original survey.
- Implementation of an exclusion zone of at least 30 m to be implemented around any new holt or resting place.
- Avoid creating any obstructions to established otter pathways or access to open water as instructed by the ECoW.
- Avoid working in the vicinity of identified otter habitat (i.e. the watercourses and waterbodies) during the hours of darkness and within two hours after sunrise and two hours before sunset. This can be reduced to one hour between November and February due to limited daylight.
- Cap any exposed pipe systems when not being worked and provide exit ramps for any exposed trenches or excavations (to prevent otters entering and becoming trapped).
- Driver awareness and 10mph speed controls within the Proposed Development site to limit the risk of road traffic accident mortality.

8.12 Residual Effects

8.12.1 With implementation of the specific mitigation measures described in Sections 8.8 and 8.11, all impacts would reduce to barely perceptible and no significant residual effects are predicted during construction or operation.

8.13 Cumulative Assessment

8.13.1 The main reason for assessing cumulative impacts is to identify whether effects, which may not be significant from individual developments, are likely to be significant when combined with nearby existing or proposed schemes. The main projects likely to cause similar impacts to those associated with the Proposed Development are other operational wind farms, those under construction or those consented. Several other wind farms are present within the wider area, in planning, under construction and operational.

8.13.2 Wind farm projects at the scoping stage have been scoped out of the cumulative assessment, because they generally do not have sufficient information on likely impacts to be included, as the baseline survey period is ongoing, or results have not been published. Projects that have been refused or withdrawn have also been scoped out.

8.13.3 It should be noted that there is no published SNH guidance for cumulative impact assessment on terrestrial ecological receptors. SNH Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012) is confined to landscape and visual impacts and to those affecting birds. The key principle of SNH'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. Application of the outlined principles to terrestrial ecological features leads to a focus on the likely cumulative impacts to the Proposed Development's IEFs, i.e. otter.

8.13.4 At time of writing, there are a number of wind farms projects in Orkney to take into consideration. However, due to the limits of connectivity between terrestrial ecological features, this assessment has considered a 10 km radius to be appropriate, excluding developments located on different landmasses. Only the single turbines closest to the Proposed Development and over 50 m tip height have been included within the assessment. The installations considered for this cumulative assessment were therefore limited to:

- Rennibister: installed – 1.3 km west;
- Crowness Business Park: installed – 1.6 km east;
- Akla: approved but not built - approximately 8.5 km south-west;
- Hammars Hill: installed - approximately 8.9 km north-west; and
- Work Farm: approved but not built - approximately 5.2 km east.

8.13.5 An otter survey for Rennibister single turbine found no sign of otter at the site but signs were found in the wider vicinity. The Environmental Statement identified low effects during construction (now completed) and insignificant effects during operation. An otter survey was not undertaken for Crowness Business Park single turbine, but the Environmental Statement identified that otters are likely to be in the area. The Environmental Statement identified negligible effects to otters during construction (now completed) and operation.

8.13.6 No otter survey was deemed necessary or undertaken at Akla Wind Farm while otter surveys at both Work Farm Wind Farm and Hammers Hill Wind Farm identified the presence of otter with a single possible resting place being identified at Hammers Hill Wind Farm. The effects on otter were assessed as not significant at both of these wind farm sites at both construction and operation stages.

8.13.7 Due to the lack of predicted impacts at these sites and their physical separation, and, in relation to Rennibister and Crowness Business Park, their operational status, these installations are not considered to have any direct cumulative impact on otter. Akla, Hammears Hill and Work Farm have no direct connectivity with the Proposed Development, being located within a different catchments and therefore outwith the Ecological Zone of Influence of the Proposed Development.

8.14 Summary

8.14.1 An assessment of terrestrial ecology effects arising from the construction and operation of the Proposed Development was undertaken, based on the current Proposed Development layout and turbine dimensions. A range of ecological studies were undertaken, to identify the terrestrial ecological interests of the Proposed Development and to establish the ecological baseline for the ecological impact assessment (EcIA). This included identification of existing wildlife records and nearby sites designated for nature conservation and survey of the habitats and faunal interests of the site. Field surveys undertaken: Phase 1 habitat survey and otter survey.

8.14.2 The primary habitats (listed in order of size) identified on site are currently: improved grassland, arable, hard standing roads and tracks, intertidal boulders/rocks, running water and standing water. A number of small water bodies are present within the Study Area and an area of potential GWDTE wet heath was identified within the survey buffer, but outwith the application boundary and over 600 m from the nearest infrastructure.

8.14.3 Only brown hare presence and evidence of otter activity was recorded during surveys. Through a standardised evaluation method, the following Important Ecological Features (IEFs) were identified and brought forward for assessment: otter.

8.14.4 In line with guidelines, the impact assessment process assumes the application of standard mitigation measures. With these in place, predicted effects are considered to be barely perceptible and therefore not significant. Although likely effects were not assessed as being significant, some additional mitigation measures are proposed to further minimise any adverse effects. With further mitigation detailed, residual impacts for construction and operation phases are considered to be

barely perceptible adverse and therefore no significant effects are anticipated. Likely cumulative effects of nearby developments, consented or at application stage, were also considered; no significant cumulative effects are anticipated.

8.14.5 The assessment concludes that there will be no significant adverse effect on any of the terrestrial ecological interests of the site, resulting from the construction and operation of the Proposed Development.

Table 8.9 – Summary of Effects

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Loss of habitat and disturbance to otter	Barely perceptible	Adverse	Implementation of Species Protection Plan.	Barely perceptible	Adverse
Mortality to otter	Low	Adverse		Barely perceptible	Adverse
Operation					
Effects on otter populations on site during operation	Barely perceptible	Adverse	None	Barely perceptible	Adverse

Table 8.10 – Summary of Cumulative Effects

Receptor	Effect	Cumulative Developments	Significance of Cumulative Effect	
			Significance	Beneficial/ Adverse
Otter	Mortality and Habitat loss	Rennibister, Crowness Business Park, Akla, Hammars Hill, Work Farm)	No cumulative effect	N/A

8.15 References

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