

# 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 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 (EclA). 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: extended National Vegetation Classification (NVC) habitat survey;
  - fish habitat survey; and
  - otter survey.
- 8.1.3 The primary habitats (listed in order of size) identified on site are currently:
- Blanket bog;
  - Wet dwarf shrub heath;
  - Dry dwarf shrub heath;
  - Bracken;
  - Coniferous woodland – plantation; and
  - Marshy grassland.
- 8.1.4 A single stream, the Burn of Longigill, is present within the development footprint and flows directly south into the Burn of Ore, which is located c.300 m south of the nearest turbine. A concrete reservoir was recorded within the north of the study area and a number of small water bodies were recorded in association with blanket bog habitats.
- 8.1.5 The desk study, which included a 2km survey buffer, identified the presence of grey seal and otter.
- 8.1.6 Through a standardised evaluation method, Important Ecological Features (IEFs) were identified and brought forward for assessment. IEFs taken forward to assessment include:
- Hoy SAC and SSSI;
  - Hoy and North Walls SSSI Moorland Fringes LNCS;
  - Blanket bog;
  - Dry dwarf shrub heath;
  - Wet heath;
  - Running water;
  - Mountain hare; and
  - Fish.
- 8.1.7 Potential impacts of the construction and operation phases are presented, prior to the assessment of effects. 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, with the exception of loss of wet heath and blanket bog habitats and the effects of these losses on the Hoy and North Walls SSSI Moorland Fringes LNCS. Given these effects, compensation is proposed in the shape of measures secured via a Habitat Management Plan (HMP). A species protection plan is also proposed to further minimise any adverse effects on mountain hare. With the compensation and further mitigation detailed, residual impacts for both construction and operation phases are considered to have barely perceptible adverse and therefore not significant effects on all IEFs.

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 and operation 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 ITP Energised (ITPE) and is supported by baseline data provided within the following technical appendices:

- Appendix 8.1 – Extended Habitats and National Vegetation Classification Report;
- Appendix 8.2 - Otter (*Lutra lutra*) Survey Report;
- Appendix 8.3 – Ecological Desk Study Report; and
- Appendix 8.4 – Fish Population Assessment.

8.2.3 The chapter is further supported by Appendix 8.5: Outline Habitat Management Plan.

8.2.4 The ‘study area’ for the habitat and otter surveys in this assessment included a minimum 250 m radius buffer beyond the potentially developable area of turbines and 100 m radius buffer to the proposed access track routes in the north-east. The study area for the fish surveys included the catchment of the Burn of Ore.

8.2.5 The specific objectives of the chapter are to:

- describe the ecological impact assessment (EclA) 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.

8.2.6 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 Allan Taylor (BA (Hons), MSc. ACIEEM) and Mikael Forup (BSc (Hons), PhD Restoration Ecology; CEnv, MCIEEM) ecologists with a combined over 20 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, 2014); 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);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London (Collins, J. 2016);
- Scottish Fisheries Co-ordination Centre Training Manual: Team Leader Electrofishing (SFCC, 2014);
- 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 8.4).

## 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 - Consultation Relevant to Non-avian Ecology**

Consultee	Key Consultee Comments	Applicant Action
Planning Manager, 8 <sup>th</sup> August 2018, Orkney Islands Council (OIC)	Mitigation measures should be implemented to avoid or minimise adverse effects from occurring.	Noted
	The aged nature of Phase 1 habitat surveys in the area, from 2008, indicate that further surveys will be required to obtain up to date information.	An extended National Vegetation Classification (NVC) survey was completed covering the development area and a 250m survey buffer.
	Bats are known to forage along the coastline in this part of Hoy / Walls. An appropriate level of study for the presence of bats and any mitigation measures arising therefrom to avoid or minimise adverse effects is advised, and bat surveys cannot be scoped out.	Following the reduction of the scheme from 30 to 6 turbines ITPE discussed the bat survey requirements further with OIC and they responded with <i>“ITP Energised has committed to consulting the local bat group and this approach is welcomed. Bat group members are likely to have the most up to date information on bat activity in the Hoy and Walls area. Turbine T1 is relatively close to the wooded area alongside the access track to Wee Fea so it would be helpful to find out if any bat activity has been recorded there in recent years.”</i>  The extended NVC survey confirmed that the development area was not suitable roosting or foraging habitat for bats. The desk study, including consultation with the local bat group, returned no records of bat activity within the study area, as

Consultee	Key Consultee Comments	Applicant Action
		such bat survey work was not considered necessary.
	The presence of brown trout and/or migratory sea trout in the Burn of Ore and the nearby Burn of Heldale should be addressed with assessment of the effects of the proposal on the Ore and Heldale burns and any associated tributaries being required. Appropriate pollution and sediment control and monitoring strategies in particular are advised.	A fish survey was completed along the Burn of Ore and assessed in Section 8.10. No part of the Proposed Development is located within the catchment of Burn of Heldale. A CEMP will be produced and agreed with SEPA / OIC in order to implement measures to prevent pollution / sedimentation of watercourses.
Development and Marine Planning, Orkney Islands Council	The proposed development is located within the Hoy and North Walls SSSI Moorland Fringes Local Nature Conservation Site.	All local nature designations are included and considered as part of this assessment.
	Mitigation measures should be implemented to avoid or minimise adverse effects.	Noted
	The assessment should include consideration of the Scottish Biodiversity Strategy which comprises 'Scotland's Biodiversity It's in Your Hands' (2004) and its supplement '2020 Challenge for Scotland's Biodiversity (2013)'.	Noted
	As ten years have elapsed since Phase 1 habitat surveys were undertaken in 2008 further surveys are needed to obtain up to date information.	An extended National Vegetation Classification (NVC) survey was completed covering the potentially developable area of turbines and a 250m survey buffer.
	Bats are known to forage along the coastline in this part of Hoy / Walls; therefore, the requirement for dedicated bat surveys should be considered. Further information may be available from the local bat group	The extended NVC survey outlined that the development area was not suitable roosting or foraging habitat for bats. The local bat group were contacted and had no records of bats available for Hoy and outlined contacting the local records centre, which was/closed due to COVID-19. The desk study returned no records of bat activity within the study area, as such bat survey work was not considered necessary.
	The Orkney Trout Fishing Association (OTFA) regularly monitors a number of burns in Orkney and have confirmed the presence of migratory	A fish survey was completed along the Burn of Ore and assessed in Section 8.10. No part of the Proposed Development is located

Consultee	Key Consultee Comments	Applicant Action
	<p>seatrout in the Burn of Ore. The nearby Burn of Heldale also supports a resident brown trout population. Further information is likely to be available from the OTFA. Assessment should therefore be undertaken of the effects of the proposal on the Ore and Heldale burns and any associated tributaries.</p>	<p>within the catchment of Burn of Heldale. OTFA provided information regarding a trout survey completed on the Burn of Ore in 2007 which is used as part of the assessment.</p>
	<p>Alterations to roads or pier infrastructure may prove necessary, to enable transport of turbine parts and other materials to the development site. These works would be inextricably linked to the wind farm development, therefore their potential to cause environmental effects should be fully assessed in the EIA, and mitigation identified, as appropriate.</p>	<p>The engineers at Pell Frischmann outlined on 19<sup>th</sup> May 2020 due to the small size of the Proposed Development that there are only street furniture works, such as lighting units and laydown areas, proposed at the pier, minor modifications to current tracks such as strengthening of cattle grids and run off areas on bends on the track, meaning any significant works are not likely required.</p> <p>As such no further assessment is deemed necessary.</p>
<p>Scottish Natural Heritage (SNH)</p>	<p>The development site borders Hoy SAC. The key requirement is the assessment of any indirect impacts on qualifying habitats of the SAC due to the disruption of hydrological processes within the development site. SEPA's scoping response of 18 May 2018 provides detailed advice regarding the information that needs to be provided regarding the assessment of impacts on Groundwater Dependent Terrestrial Ecosystems within the development site, and therefore to assess any knock-on impacts on the SAC.</p>	<p>Noted. All nature designations within the local area are included and considered as part of this assessment.</p>
<p>22nd May 2018, Conservation Officer, RSPB</p>	<p>A large proportion of the site is classified as Class 1 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.</p>	<p>The impacts and proposed mitigation on blanket bog and deep peat habitats are fully covered within the assessment (See Section 8.10). Issues relating to peat are also assessed in Chapter 11 (Geology, Peat, Hydrology &amp; Hydrogeology).</p>
	<p>The proposed development site significantly overlaps with the existing Hoy and North Walls SSSI Moorland Fringes LNCS, with all of the proposed turbines located within the boundary. We consider that the applicant should provide full</p>	<p>The presence of North Walls SSSI Moorland Fringes LNCS and its associated habitats are fully considered as part of the assessment with mitigation in the form of a</p>



Consultee	Key Consultee Comments	Applicant Action
	<p>information seeking to demonstrate compliance with Policy 9 (A3) (Locally Important Sites) of the adopted Orkney Local Development Plan 2017 which is as follows <i>“Locally Important Sites i. Development likely to negatively affect a Local Nature Conservation Site (LNCS), Local Nature Reserve (LNR) or unnotified Geological Conservation Review (GCR) site will only be permitted where there is no feasible alternative location; and a) mitigative measures will be satisfactorily implemented to ensure that it will not affect the integrity of the area or the qualities for which it has been designated; or b) any such effects are clearly outweighed by social, environmental or economic benefits”</i></p>	<p>habitat management plan proposed to mitigate for impacts on the integrity of the LNCS.</p>
<p>Scottish Environment Protection Agency (SEPA)</p>	<p>We note from the Scoping Report that <i>“peat is recorded on both BGS and SNH mapping in most of the site, specifically blanket bog on the western part of the site. Site observations show that there is widespread peat across the site”</i> and peat probing is proposed. As such we welcome that an outline Peat Management Plan will be included within the EIA Report – see Section 3 of the attached appendix for best practice advice on undertaking and producing this.</p>	<p>Full consideration of blanket bog habitats has been undertaken as part of this assessment. See also Chapter 11 (Geology, Peat, Hydrology &amp; Hydrogeology) for assessment of peat on the site.</p>
	<p>Reference is made in the supporting information to the proximity to SPA and SSSIs. The neighbouring SAC is designated for bog, heath, fen, spring and ponds. Section 6.4.3 of the report states that <i>“a NVC survey will be carried out simultaneously with the Phase 1 habitat survey”</i>. We can confirm we support this and consider this is acceptable on a large site such as this as there may be large areas of habitat which don't require GWDTE assessment or are outwith the 250 m or 100m buffers for GWDTE assessment.</p>	<p>An extended National Vegetation Classification (NVC) survey was completed covering the development area and a 250 m survey buffer. Phase 1 habitat categories were back worked from the NVC mapping.</p>
<p>Regulations and Development manager, Forestry Commission Scotland, 3<sup>rd</sup> May 2018</p>	<p>There is a small area of woodland planted under Woodland Grant Scheme 2, located in the south-western part of the proposed development site, adjacent to B9047 – marked as Halyei on OS Map. If any supporting infrastructure (e.g. borrow pit or an access track) forces removal of trees, then felling approval should be sought and a suitable compensatory planting area agreed with FCS.</p>	<p>The section of woodland outlined in the response will not be affected by the Proposed Development.</p>

Consultee	Key Consultee Comments	Applicant Action
Marine Scotland, 23 <sup>rd</sup> May 2018	The proposed development site is mostly drained by the Burn of Ore which supports salmon and trout populations; the potential impact on these fish populations as a result of the proposal should be considered and discussed in the EIA Report. MSS guidelines on the assessment of potential impacts on fish populations associated with wind farm developments should be consulted.	A fish survey was completed along the Burn of Ore and fish species are discussed as part of this assessment.
	Site characterisation surveys of fish populations and water quality (hydrochemical parameters e.g. pH, alkalinity, dissolved organic acid, acid neutralising capacity and turbidity at high and low flows) should be carried out in watercourses within and downstream of the proposed development area to inform baseline conditions and from which potential impacts can be assessed. Information from these surveys should also allow appropriate site specific mitigation measures (e.g. watercourse crossings to accommodate fish movement requirements, buffer zones adjacent to all watercourses, the appointment of an Ecological Clerk of Works) to be drawn up and for monitoring programmes before, during and after construction to be established, the latter should be carefully designed in order to identify and rapidly remediate any changes in water quality or fish populations, should they occur, throughout the course of the development. Monitoring should also be considered in a decommissioning/ restoration plan. Further information regarding survey/monitoring programmes is available at the above website	The consultation response related to a larger 30 turbine scheme; Marine Scotland later updated their response adding <i>“the generating capacity is likely to be below 50MW and consequently MSS will not be asked to provide any further advice to ECU in relation to this development.”</i>  For further details relating to monitoring of watercourses see Chapter 11 (Geology, Peat, Hydrology & Hydrogeology).
	We note the medium to high risk of flooding within the proposed development area and we recommend the developer to consider this matter in the design of the wind farm such that potential impacts on fish populations will be avoided and/or minimised	The risk of flooding and hydrological issues are assessed in Chapter 11 (Geology, Peat, Hydrology & Hydrogeology).
	The potential cumulative impacts on the water quality and fish populations, as a result of the present proposal and adjacent developments (including operational and proposed wind farms) should be discussed in the EIAR.	The cumulative impacts of the development are discussed in Section 8.13.

Consultee	Key Consultee Comments	Applicant Action
<p>Orkney Trout Fishing Association, 22<sup>nd</sup> May 2020</p>	<p>The Burn of Ore supports an anadromous brown trout population, one of several burns on the east side of Hoy to do so. These burns are too small to fish in but collectively they support a recreational sea trout fishery at sea, more of which you can read about on the OTFA website. The Burn of Ore, along with all the Hoy burns, are relatively pristine in character, mainly as they drain a landscape which does not lend itself to agricultural improvement. In contrast, on the Orkney mainland, which is dominated by agricultural activity, most spawning burns have been ditched and straightened. This puts a little more value on maintaining the present character of the Hoy burns, the Burn of Ore included.</p>	<p>This is noted and a Local value has been assigned to the Burn of Ore in Section 8.7.</p>
	<p>While the Burn of Longigill may have been too small for electrofishing during the visit you mentioned, trout could exist here, particularly in its lower reaches. You do not mention a location for the crossing point, but it might be best to assume that the tributary does support trout and proceed accordingly. In any case, the main branch of the burn certainly does support trout and this should influence any instream works accordingly.</p>	<p>As described in Section 8.10, a watercourse crossing is needed close to the source of the burn, where there is no fish habitat, and potential impacts on fish species are limited to possible effects in the downstream environment. Implementation of embedded mitigation will reduce risks to a minimum.</p>
	<p>One other issue I would draw your attention to is the presence of a dam on the Burn of Ore at ND 29079 93392. I am not sure of the history of the dam but it seems clear that the structure is redundant and presents a hindrance to fish migration. It would be positive result if the structure could be removed and would count towards the net environmental gain achieved by this project.</p>	<p>Removal of the dam would result in a small adverse cultural heritage impact, because a dam has been present in this location for over a century and is likely to incorporate earlier structural remains. In addition, the dam has some local cultural heritage value as a heritage asset relating to 19th century and possibly earlier land management practices. As noted in Appendix 8.4, the dam is considered to be passable for trout. As such we propose to leave the structure in place.</p>

## 8.5 Assessment Methodology and Significance Criteria

### **Ecological Desk Study**

8.5.1 An ecological desk study was undertaken that included obtaining data from third parties and it is presented as part of Appendix 8.3. 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 Ecological studies were undertaken to establish the site baseline for habitats and a range of protected or otherwise notable species. The ecological baseline presented in this chapter is derived from the following technical studies:

- An extended NVC survey conducted in November 2019 of the ‘study area’ defined as potentially developable area with a 250 m survey buffer around potential locations with deep (>1m) excavations, such as turbine foundations, but a 100 m survey buffer for areas with potential shallow excavations, such as tracks, to identify potential groundwater-dependent terrestrial ecosystems, which could be vulnerable to the Proposed Development (see Appendix 8.1);
- Otter survey conducted in November 2019 of the same area and 250 m survey buffer to either end of the watercourse reaches studied (see Appendix 8.2); and
- Fisheries surveys undertaken on 27<sup>th</sup> and 28<sup>th</sup> September 2019. The survey included the Burn of Ore, whereas the Burn of Longigill was too small to be electric fished. The habitat was assessed and sites were electro-fished on the main river channel, with sites chosen for their accessibility, to facilitate repeat surveys. (See Appendix 8.4 for further details of the methodology).

8.5.3 Full details of the methodologies applied are presented in Appendix 8.1-8.4.

### **Evaluation Methods for Ecological Features**

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

**Table 8.2 – Geographical Evaluation Criteria**

Scale of Ecological Value	Criteria	Examples
International	<p>Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of international importance.</p> <p>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,</p>	<p>International nature conservation areas:</p> <ul style="list-style-type: none"> <li>– Any SAC;</li> <li>– Any candidate SAC (cSAC); and</li> <li>– Any Ramsar wetland.</li> </ul> <p>Significant numbers of a designated population outside the designated area.</p> <p>A site supporting more than 1% of the EU population of a species.</p>

Scale of Ecological Value	Criteria	Examples
	from the best available evidence, to depend.	
National (Scotland)	<p>Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of national importance.</p> <p>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.</p>	<p>National nature conservation areas:</p> <ul style="list-style-type: none"> <li>- Any SSSI or NNR designated for biological feature(s).</li> </ul> <p>A site supporting more than 1% of the UK population of a species.</p> <p>Nationally important population/assemblage of a European Protected Species (EPS) or species listed on Schedule 5 of the WCA.</p>
Council area (Orkney)	Nature conservation resource, i.e. nature conservation designation, habitat or species, of importance on a council area scale.	<p>Statutory and non-statutory nature conservation designations:</p> <ul style="list-style-type: none"> <li>- Any Local Nature Reserve (LNR);</li> <li>- Any Local Nature Conservation Site (LNC);</li> <li>- Any Scottish Wildlife Trust (SWT) reserve; and</li> <li>- Any Local Biodiversity Site (LBS).</li> </ul> <p>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.</p> <p>A council area-scale important population/area of a species or habitat listed on the local Biodiversity Action Plan (local BAP).</p> <p>A council area-scale important population/assemblage of an EPS or species listed on Schedule 5 of the WCA.</p>
Local (i.e. within 2 km of the site)	Nature conservation resource, e.g. a habitat or species of importance in the context of the local district.	<p>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.</p> <p>An area supporting 0.05-0.5% of the UK population of a species.</p>

Scale of Ecological Value	Criteria	Examples
		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.

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

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

### ***Impact Assessment Methods***

8.5.7 The approach to the Ecological Impact Assessment (EclA) 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.

8.5.8 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***

8.5.9 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:

8.5.10 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**

8.5.11 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.

### **8.5.12 Characterising Ecological Impacts and Effects**

8.5.13 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.

8.5.14 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.

8.5.15 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.

8.5.16 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**

<b>Level of impact</b>	<b>Definition</b>
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.

Level of impact	Definition
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.
<p>The following definitions have been applied in respect to timescales:</p> <p>Immediate: Within approximately 12 months;</p> <p>Short term: Within approximately 1-5 years;</p> <p>Medium term: Within approximately 6-15 years; and</p> <p>Long term: More than 15 years.</p>	

8.5.17 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***

8.5.18 An EclA 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.

8.5.19 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.

8.5.20 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.

8.5.21 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.

8.5.22 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.

8.5.23 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***

#### **Otter**

8.5.24 The otter survey was undertaken following and during generally dry conditions and there were no limitations to access within the study area.



## Habitats

8.5.25 The NVC surveys were carried out in November, which is slightly later than is considered optimal for NVC surveys. As a result, some early flowering plants may have been missed due to the timing of the survey; however, this is unlikely to have affected the conclusions drawn from the results. See Appendix 8.1 for further details.

## Fish

8.5.26 The electro-fishing survey was undertaken under generally dry conditions and there were no limitations to access within the study area. A planned fish habitat assessment survey was cancelled due to Covid-19 lockdown regulations, meaning a detailed habitat assessment of the Burn of Longigill was not undertaken. However, the relevant habitats were assessed where possible using the surveyors' professional knowledge. The survey cancellation was covered by contacting the OTFA for survey data of both the Burn of Longigill and Burn of Ore; therefore, it is not considered that the survey limitations significantly affect the conclusions drawn from the results.

## 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 Nature conservation designations within 5 km of the Proposed Development, for statutory designations, and 2 km of the Proposed Development for non-statutory designations are shown on Figure 8.1 and detailed in Table 8.4 and Appendix 8.3. For the purposes of brevity, all features presented here are relevant to non-avian ecology only. 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
<b>Statutory</b>			
Hoy	Special Area of Conservation (SAC)	Directly W of site	Annex I habitats that are a primary reason for selection of this site: <ul style="list-style-type: none"><li>▪ Vegetated sea cliffs of the Atlantic and Baltic Coasts;</li><li>▪ Natural dystrophic lakes and ponds;</li><li>▪ Northern Atlantic wet heaths with <i>Erica tetralix</i>;</li><li>▪ Alpine and Boreal heaths; and</li><li>▪ Blanket bogs (* if active bog) * Priority feature.</li></ul>

Site	Designation	Distance to Site	Non-ornithological Reasons for Designation
			<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>▪ European dry heaths;</li> <li>▪ Petrifying springs with tufa formation (<i>Cratoneurion</i>) * Priority feature;</li> <li>▪ Alkaline fens; and</li> <li>▪ Calcareous rocky slopes with <i>chasmophytic</i> vegetation.</li> </ul>
	Site of Special Scientific Interest (SSSI)		<p>The site is designated for the following ecological features:</p> <ul style="list-style-type: none"> <li>▪ Blanket bog;</li> <li>▪ Dystrophic loch;</li> <li>▪ Upland assemblage; and</li> <li>▪ Upland oak woodland.</li> </ul>
<b>Non-Statutory</b>			
Hoy and North Walls SSSI Moorland Fringes	Local Nature Conservation Site (LNCS)	Partly overlaps with site	<p>This large site stretches from Lyrawa Hill in the north to the lower slopes of Binga Fea in the south, occupying the hill slopes east of the Hoy SSSI. Throughout, the major habitat of these hills is blanket bog on deep peat, with a lesser amount of wet heather moorland on thinner peat on steeper slopes. Bog plants are typically common cottongrass (<i>Eriophorum angustifolium</i>) and heather (<i>Calluna vulgaris</i>), with deergrass (<i>Trichophorum germanicum</i>), bog asphodel (<i>Narthecium ossifragum</i>) and <i>Sphagnum</i> mosses. Valleys with swift-flowing burns cut through the hills, and here there is greater variety of habitat including native willows (<i>Salix</i> sp), other trees and bracken (<i>Pteridium aquilinum</i>). In places these burns are edged by marshes and calcium-rich springs, these supporting a greater variety of flowering plants different from those found on peat bog and heath.</p> <p><b>Special Habitats:</b> Upland heath*, blanket bog*, crowberry heath, upland flushes, fens and swamps*, upland birchwood*, upland willow scrub, conifer plantation, burns and canalised burns,</p>

Site	Designation	Distance to Site	Non-ornithological Reasons for Designation
			<p>oligotrophic and dystrophic lakes*, maritime cliff and slope*, and Coastal saltmarsh*.</p> <p><b>Special Wildlife:</b></p> <p>Mountain hare (<i>Lepus timidus</i>)*, otter (<i>Lutra lutra</i>)*, common toad (<i>Bufo bufo</i>), common hawkler dragonfly (<i>Aeshna juncea</i>), black darter dragonfly (<i>Sympetrum danae</i>), large red damselfly (<i>Pyrrhosoma nymphula</i>), common blue damselfly (<i>Enallagma cyathigerum</i>), meadow grasshopper (<i>Chorthippus parallelus</i>), moss carder bee (<i>Bombus muscorum</i>)*, aspen (<i>Populus tremuloides</i>), grey willow (<i>Salix cinerea</i>), tea-leaved willow (<i>Salix triandra</i>), rowan (<i>Sorbus aucuparia</i>), downy birch (<i>Betula pubescens</i>), field gentian (<i>Gentianella campestris</i>)*, heath cudweed (<i>Gnaphalium sylvaticum</i>)*, small adder's-tongue (<i>Ophioglossum azoricum</i>)*, juniper (<i>Juniperus communis</i>)*; mud sedge (<i>Carex limosa</i>), broad-leaved cottongrass (<i>Eriophorum latifolium</i>), bog orchid (<i>Platanthera</i> sp), alpine bearberry (<i>Arctous alpina</i>)*, and great sundew (<i>Drosera anglica</i>)*.</p> <p>* Nationally important habitats and species.</p>
Crockness	LNCS	Directly E of site	<p>An area mainly of blanket peat, sub-divided into several enclosures. Dominant plants are bog cotton and heather, with crowberry and <i>Sphagnum</i> mosses. Peat cutting, drainage and grazing have affected parts of the site, and some of these are now drier heather moorland and others marshy grassland with rushes.</p> <p>Special Habitats: Upland heath* and blanket bog.</p> <p>* Nationally important habitat.</p>

8.6.3 As detailed in Table 8.4, a single statutory designated area, Hoy SAC and SSSI, is located immediately to the west of the western Proposed Development boundary. No other statutory area designation for ecological features is present within 5km of the site.

8.6.4 The Proposed Development is located within the Hoy and North Walls SSSI Moorland Fringes LNCS. A second LNCS, Crockness LNCS, is located directly east of the Proposed Development.

#### Protected or otherwise notable species

8.6.5 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 5 km of the site boundary and dating from within the last 10 years and are shown Table 8.5. The desk study results also include records of publicly available records of protected or otherwise notable species from locations within

5 km of the Proposed Development centre and dating from within the last 10 years, as summarised in Table 8.5.

8.6.6 In May 2011, otter spraints and lie-ups were recorded on Burn of Ore, near Ore Farm, approximately 1 km southeast of the access track from T1 to T2, but c.2.5 km downstream of the confluence of Burn of Longigill with Burn of Ore. There were no signs of otters away from the main burn (Orkney Sustainable Energy, 2011).

8.6.7 Dragonflies and damselflies were recorded by pools near Little Wee Fea during the Orkney Field Club 'Annual Dragonfly Walk' undertaken in July 2019 (Walker, 2019). Three species of conservation interest were recorded, as shown in Table 8.5.

**Table 8.5 – Records of Protected or Otherwise Notable Species from within 5 km of the Site**

Common Name	Scientific Name	Legal / Conservation Status	Records
Grey Seal	<i>Halichoerus grypus</i>	Wildlife and Countryside Act 1981 (as amended)  Orkney LBAP	Two records in Weddell Sound located 2-3 km east of the Proposed Development.
Common seal	<i>Phoca vitulina</i>	Marine (Scotland) Act 2010.  The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) also prohibit certain methods of catching or killing seals.  The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014.  Orkney LBAP	Two records of common seal were identified in 2012, located 3.57km north-east of the site boundary.
Common dolphin	<i>Delphinus delphis</i>	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).  Cetaceans in waters more than 12 nautical miles from land are protected under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2017.  SBL	A single record of common dolphin was recorded in 2017, located 650m east of the site boundary.

Common Name	Scientific Name	Legal / Conservation Status	Records
		Orkney LBAP	
Common porpoise	<i>Phocoena phocoena</i>	Cetaceans in waters more than 12 nautical miles from land are protected under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2017.  SBL Orkney LBAP	Two records of common porpoise were recorded in 2017, the closest located 1.81km south-east of the site boundary.
Minke whale	<i>Balaenoptera acutorostrata</i>		A single record of minke whale was recorded in 2015, located 1.82km east of the site boundary.
Risso's dolphin	<i>Grampus griseus</i>		A single record of risso's dolphin was recorded in 2012, 2.39km east of the site boundary.
Mountain Hare	<i>Lepus timidus</i>	Wildlife and Countryside Act 1981 (as amended)  SBL Orkney LBAP	Qualifying species of Hoy and North Walls SSSI Moorland Fringes LNCS which overlaps the study area.
Otter	<i>Lutra lutra</i>	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).  SBL Orkney LBAP	Qualifying species of Hoy and North Walls SSSI Moorland Fringes LNCS which overlaps the study area.  Recorded on Burn of Ore c.1 km southeast of the track between T1 and T2 in 2011.
Bat species	<i>Chiroptera</i> species	Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)  SBL LBAP	A single record of a 'bat species' was identified on 8 <sup>th</sup> October 2016 approximately 1 km east of the site and again on 10 <sup>th</sup> October 2016 1.9 km east of the site. Between three and ten records of up to seven bats are recorded at North Walls between 2011 and 2018, all recorded between 4 km to 5 km south of T4. All species records were of common pipistrelle ( <i>Pipistrellus pipistrellus</i> ) or 'pipistrelle' or bat species.
Common Toad	<i>Bufo bufo</i>	Wildlife and Countryside Act 1981 (as amended)	Qualifying species of Hoy and North Walls SSSI Moorland Fringes LNCS which overlaps the study area.

Common Name	Scientific Name	Legal / Conservation Status	Records
		SBL	
Black darter	<i>Sympetrum danae</i>	Orkney LBAP	Recorded in Wee Fea in each year 2014-2018.
Blue-tailed damselfly	<i>Ischnura elegans</i>	Orkney LBAP	Recorded in Wee Fea in each year 2014-2018.
Common Hawker	<i>Aeshna juncea</i>	Orkney LBAP	Wee Fea pools south of track to T2 in Annual Dragonfly Walk, 25 July 2019 and recorded in Wee Fea in each year 2014-2018.
Common blue damselfly	<i>Enallagma cyathigerum</i>	Orkney LBAP	Wee Fea pools south of track to T2 on Annual Dragonfly Walk, 25 July 2019 and recorded in Wee Fea in each year 2014-2018.
Large red damselfly	<i>Pyrrosoma nymphula</i>	Orkney LBAP	Wee Fea pools south of track to T2 on Annual Dragonfly Walk, 25 July 2019 and recorded in Wee Fea in each year 2014-2018.

## Field Surveys

### Habitats

8.6.8 The results of the habitat surveys are outlined in this Section and shown on Figure 8.2 (NVC communities) and (Phase 1 habitats, back worked from NVC categories) on Figure 8.3, which illustrate the location and extent of vegetation types recorded within the study area. For a full description of the survey results and detailed Figures (TA8.1.2, TA8.1.3 and TA8.1.4), please refer to Technical Appendix 8.1. A total of 18 habitats were recorded within the study area. Table 8.6 presents the cover of each habitat.

**Table 8.6 - Cover of vegetation types (displayed in size order)**

Phase 1 Habitat Code	NVC type (where relevant)	Extent in study area (ha)
E1.6.1 Blanket bog	M17 <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire / M1 <i>Sphagnum denticulatum</i> bog pool community	245.0
D2 Wet dwarf shrub heath	M15 <i>Trichophorum cespitosum</i> – <i>Erica tetralix</i> wet heath	193.4
D1 Dry dwarf shrub heath	H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath	62.7

Phase 1 Habitat Code	NVC type (where relevant)	Extent in study area (ha)
C1 Bracken	U20 <i>Pteridium aquilinum</i> – <i>Galium saxatile</i> community	18.86
A1.2.2 Coniferous woodland - plantation	n/a	5.09
B5 Marshy grassland	M27 <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> tall-herb fen	3.54
	M23 <i>Juncus effusus/acuteiflorus</i> – <i>Galium palustre</i> rush-pasture	4.53
	M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (on shallow/no peat)	0.05
J4 Bare ground (including hardstanding)	n/a	2.74
E2.1 Flush and spring – acid and neutral	M6 <i>Carex echinata</i> – <i>Sphagnum fallax /denticulatum</i> mire	1.28
E2.1 Flush and spring – basic	M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	0.17
B4 Improved grassland	n/a	0.44
G1 Standing water	n/a	0.27
Private garden	n/a	0.21
J2.3.1 Species rich hedgerow with trees	n/a	0.14
J3.6 Buildings	n/a	0.13
A1.3.2 Mixed woodland – plantation	n/a	0.11
C3.2 Non-ruderal	U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	0.07
G2 Running water	n/a	0
J2.4 Fence	n/a	0
<b>TOTAL</b>		<b>539.03</b>

- 8.6.9 An overview of the vegetation types recorded within the study area is presented below; for full descriptions, scientific names and target notes please refer to Appendix 8.1.

Conifer / mixed plantation

- 8.6.10 An area of c.100 m wide conifer plantation is located south of the access track. It comprises Scots pine up to c.10 m tall, many of which are severely damaged or stunted from the wind. The plantation has an open character toward the northern end. The shrub and field layers are relatively open and comprised of common grasses. A small section of the plantation, at the southern end, was noted as mixed plantation.

Improved grassland

- 8.6.11 There is no improved grassland within the main body of the site, but fields of improved grassland occur in the study area surrounding the access track. Grasslands are used for livestock grazing and comprise distinct fields separated by post and wire fencing. Common grassland species, such as perennial rye-grass, white clover, common nettle and creeping buttercup, are present in these fields.

Marshy grassland

- 8.6.12 Areas of marshy grassland are scattered across the study area. Where they occur in association with the agricultural fields surrounding the access track, the vegetation is dominated by soft-rush and/or sharp-flowered rush and a range of grasses, notably Yorkshire fog and bent grasses, and mainly comprise rush-pasture conforming to M23 *Juncus effusus/acuteiflorus*–*Galium palustre* rush-pasture in the NVC classification.
- 8.6.13 Some vegetation along the access track shows affinity to M25 *Molinia caerulea*–*Potentilla erecta* mire. It is a marshy grassland dominated by purple moorgrass. However, the fit with the NVC type is relatively poor.
- 8.6.14 M27 *Filipendula ulmaria*–*Angelica sylvestris* tall-herb fen occurs outwith the Proposed Development, in the southern and eastern parts of the study area, mainly in the Burn of Ore corridor. It is dominated by meadowsweet, with soft-rush being abundant. Common associates include purple moor-grass, Yorkshire fog, creeping bent, yellow iris, common sedge, common sorrel, Angelica and bracken.

Non-ruderal

- 8.6.15 Vegetation dominated by great wood-rush occurs in mosaic with wet heath in the south of the Proposed Development, near Burn of Ore. There are few associated species.

Bracken

- 8.6.16 Patches of bracken occur locally in the study area, often grading into adjacent communities. In some areas the bracken is very dense and has featured few associates, but elsewhere peatland species, notably heather, but also heath bedstraw, tormentil and wavy hair-grass, occur together with a range of mosses, such as red-stemmed feathermoss and common haircap moss.

Dry heath

- 8.6.17 Small areas of dry heath occur on free-draining areas within the Proposed Development. They are typically relatively low in species, with heather being the dominant species and often very dense. Frequent associates include purple moorgrass, common cotton grass and pleurocarpous mosses. The vegetation keys out as H10 *Calluna vulgaris*–*Erica cinerea* heath.

Wet heath and blanket mire

- 8.6.18 A majority of the Proposed Development and study area comprises wet heath and blanket mire, often in mosaic depending on the depth of the underlying peat substrate. The two habitats have many species in common, including some or more of the species heather, cross-leaved heath, hare's-tail cottongrass, common cottongrass, purple moor-grass, soft-rush and deergrass, as well as



a range of bryophytes. The vegetation aligns to M15 *Trichophorum cespitosum*–*Erica tetralix* wet heath and M17 *Trichophorum germanicum* –*Eriophorum vaginatum* blanket mire. However, the absence or low abundance of some typical species in individual stands of vegetation means that NVC analysis was not possible to the sub-community level for some stands. This suggests that the condition is locally suboptimal, likely as a result of historic grazing pressures. Peat cutting has also shaped the site, and scars of this activity remain evident.

- 8.6.19 However, areas of good quality, wet blanket mire and wet heath do remain: These include M17 with bog pools, mainly off the north-western Proposed Development boundary, and flushed wet heath off the western Proposed Development boundary (see Figure 8.2).

#### Flush and spring

- 8.6.20 M6 *Carex echinata-Sphagnum fallax/denticulatum* mire occurs within wet heath in two areas in the eastern part of the study area: Immediately south of conifer woodland and along a track. In both cases, the community is associated with artificial surface drainage. It is dominated by soft-rush, with other characteristic species including purple moor-grass, velvet bent, tormentil, heath bedstraw, as well as the bryophytes common haircap, flat-topped bog-moss and acute-leaved/red bog-moss.
- 8.6.21 M10 *Carex dioica-Pinguicula vulgaris* mire occurs in the west of the study area. This vegetation is characterised by sedges, such as black bog-rush and carnation sedge, as well as common butterwort and is characteristic of shallow peat flushed by base-rich water.

#### Standing water

- 8.6.22 A concrete reservoir was noted in association with underground tunnel infrastructure in the north of the study area.

#### Running water

- 8.6.23 A single water course is present within the site, the Burn of Longigill which flows south into the Burn of Ore which flows east through the southern section of the study area. The watercourses contain clear but heavily peat stained water.

#### Fence

- 8.6.24 Post and wire fencing were noted crossing all of the study area and is used for managing the livestock.

#### Buildings

- 8.6.25 The only structure within the site was a rectangular concrete structure (the former Naval Headquarters and Communication Centre), in addition to a number of ruined or collapsed stone structures and the entrance to underground tanks in the north-east of the study area.

#### Bare ground and hardstanding

- 8.6.26 A track connects the site to the public road to the east, and bare ground is associated with this track and with buildings accessing from it.

### **Groundwater-Dependent Terrestrial Ecosystems**

- 8.6.27 GWDTEs are classified according to SEPA (2017), defining each NVC community on their potential dependency on groundwater. Groundwater dependency is often linked to wetlands that contain flora that is dependent upon the chemical composition of the water fed from a groundwater source. SEPA defines the habitats with regard to their potential for groundwater dependency, therefore not all communities listed may be truly groundwater dependent. See Chapter 11 (Geology, Peat, Hydrology & Hydrogeology) for further details of the assessment of groundwater dependency.
- 8.6.28 Table lists the NVC communities that have a potential for moderate or high groundwater dependency (see Appendix 8.1 and its Tables 1 and 2) as defined by SEPA (2017). In total, three

communities have moderate potential and four communities have high potential groundwater dependency. These are shown on Figure 8.5.

**Table 8.7 - Potential GWDTE Recorded in study area**

NVC community name	GWDTE potential
M6 <i>Carex echinata</i> - <i>Sphagnum fallax/denticulatum</i> mire	High
M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	High
M15 <i>Trichophorum cespitosum</i> – <i>Erica tetralix</i> wet heath	Moderate
M23 <i>Juncus effusus/acuteiflorus</i> - <i>Galium palustre</i> rush pasture	High
M25 <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire	Moderate
M27 <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> tall-herb fen	Moderate
U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	High

8.6.29 Chapter 11 (Geology, Peat, Hydrology & Hydrogeology) includes a hydrological assessment of these wetlands. It concludes the following:

- Localised areas of potentially high groundwater dependency in the northeast of the site, near the proposed compound, are not likely to be groundwater fed. Instead they are fed with surface water runoff shedding from the hillside and collecting/around on the man-made existing track.
- Areas with potentially high groundwater dependency south of the Burn of Ore and to the west of the site are likely groundwater dependent.
- Much of the wet heath with potential moderate dependency is unlikely to be entirely groundwater fed and may be largely surface runoff shedding down the slopes.

### Species

#### Otter

8.6.30 As described in Technical Appendix 8.2 no evidence of otter was identified during the otter survey and no holts or hovers were identified within the study area.

8.6.31 The habitats within the site have limited suitability for otter, although the watercourses may be used by this species to commute between foraging grounds, such as between Heldale Water and the coastline. The lower reaches of Burn of Ore are likely to remain suitable for otter, which was recorded there in 2011 (Orkney Sustainable Energy, 2011).

#### Bats

8.6.32 No evidence of bats or habitat suitable for roosting bats was identified within the Proposed Development during the habitat survey (See Appendix 8.1 for further details). The study area as a whole had few linear features with no hedgerows, small watercourses and just the single treeline, and was noted as having limited suitability for foraging or commuting bats. The coastline east of the site may provide some limited suitability for commuting bats; however, the very closest section of coastline is over 1 km from the nearest proposed turbine location.

8.6.33 No records of bats were found within the site during the desk study and two records of presumably the same bat on two nights in October 2016 within 2 km of the proposed turbines. There are regular records of small numbers of common pipistrelle over 4 km south of T4 indicating there is likely a

small roost located in that area Avery (1991) outlines that common pipistrelle normally forages within 5 km of roost sites and given the nearest turbine is over 4 km from these records it is considered highly unlikely bats from this roost would use the site for foraging, given the distance and the lack of suitable foraging habitat in the site.

- 8.6.34 Bats are not mentioned within the designations for either Hoy SAC / SSSI or of Hoy and North Walls SSSI Moorland Fringes LNCS. Bat species are mentioned in the Orkney LBAP, with the LBAP outlining that bats are found in some settlements, such as Finstown in north of The Mainland of Orkney, which also provide foraging areas for bats that roost in nearby buildings within the 'greenspace' habitat description (Orkney's Biodiversity Steering Group, 2018).
- 8.6.35 Given the lack of records within the site from the desk study, lack of suitable bat roosting and lack of bat foraging habitat within the site and surrounding area it is assessed that bats are unlikely to use the site.

Fish

- 8.6.36 Technical Appendix 8.4 displays full details of fish surveys undertaken on 27<sup>th</sup> and 28<sup>th</sup> September 2019. The survey included the Burn of Ore catchment.
- 8.6.37 The Burn of Ore survey identified the presence of brown trout at all six sample sites. Other species included European eel, flounder and three-spined stickleback; the latter two species were only recorded near the burn's confluence with the sea.
- 8.6.38 The Burn of Longigill was not formally assessed within this survey but information was provided by the Orkney Trout Fishing Association (OFTA) regarding surveys completed in this area in 2007-2009 and the full response is added as Annex 1 to the report. OFTA concluded that there was a healthy brown trout population in the Burn of Ore up to the slightly west of where the Burn of Longigill joins. Regarding the Burn of Longigill they concluded *"While the Burn of Longigill may have been too small for electrofishing during the visit you mentioned, trout could exist here, particularly in its lower reaches. You do not mention a location for the crossing point, but it might be best to assume that the tributary does support trout and proceed accordingly."* Given the known crossing point of the Burn of Longigill is close to its source it is deemed unlikely that any brown trout will exist in this stretch of the burn.

Mountain Hare

- 8.6.39 Mountain hare were recorded during the NVC habitat survey in November 2019 with one or two individuals noted on each day.

Odonata (Damselflies and Dragonflies)

- 8.6.40 Three Odonata species of conservation interest in Orkney, common hawker, common blue damselfly, and large red damselfly, were observed during the Annual Dragonfly Walk to Little Wee Fea in July 2019. The sightings were recorded on pools south of the track leading to Turbine 2.

## 8.7 Evaluation of Recorded Features

- 8.7.1 Table 8.8 below provides a summary of the level of importance of each of the recorded features.

**Table 8.8 - Summary of Evaluation of Ecological Features**

Feature	Rationale for evaluation	Level of Importance
Hoy SAC	For designated sites, the value corresponds to the level of the designation	International
Hoy SSSI		National

Feature	Rationale for evaluation	Level of Importance
Hoy and North Walls SSSI Moorland Fringes LNCS		Council
Crockness LNCS		Council
Coniferous woodland – plantation	A strip follows the access track east of the site. Coniferous woodland is outlined as one of the habitats within Hoy and North Walls SSSI Moorland Fringes LNCS (see Table 8.4). However, although woodland is a sparse resource on Orkney, conifer plantation is considered of limited ecological value, and it is not identified as a locally important habitat on the Orkney LBAP.	Less than local
Mixed woodland – plantation	The southern edge of the coniferous woodland outlined above was noted as mixed woodland – plantation. It was noted as only a tiny section in private gardens and is therefore assessed as of Less than local ecological value.	Less than local
Improved grassland	This habitat is identified as a locally important habitat on the Orkney LBAP that provides a breeding resource for wading birds such as curlew, snipe, lapwing, oystercatcher and redshank. The impacts on the loss of breeding habitat is considered within 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
Marshy grassland - M23 <i>Juncus effusus/acuteiflorus</i> – <i>Galium palustre</i> rush- pasture	This habitat is listed as a watching brief habitat within the SBL although is considered potentially highly groundwater dependent. Small sections are found in association with hard tracks and water courses within the study area.  See Chapter 11 (Geology, Peat, Hydrology & Hydrogeology) for further details on GWDTEs.	Less than local
Marshy grassland - M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (on shallow peat)	M25 is included in the priority habitat description for blanket mire and is an Annex 1 habitat only if found on peat deeper than 0.5 m which is not the case here. This habitat is a potential GWDTE habitat (SEPA, 2017) but the assessment in Chapter 11 (Geology, Hydrology & Hydrogeology)	Less than local

Feature	Rationale for evaluation	Level of Importance
	concludes the examples in the study area are surface water fed.	
Marshy grassland - M27 <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> tall- herb fen	This habitat is listed as a watching brief habitat within the SBL and is mentioned within the farmland priority habitat of the Orkney LBAP.	Local
Non-ruderal U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall- herb community	U16 is not a conservation priority in its own right but can support species of conservation interest, notably in inaccessible locations such as inland rock outcrop and scree habitats, which is listed as a habitat on which negative impacts should be avoided. However, this specific category is absent from the study area. This habitat is a potential GWDTE habitat (SEPA, 2017).	Local
Bracken U20 <i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community	U20 occurs locally in the study area and is considered a common and widespread habitat of limited ecological value.	Less than local
Dry dwarf shrub heath H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	H10 is listed as an Annex 1 habitat, SBL priority habitat and is listed within the peatland priority habitat of the Orkney LBAP. H10 is one of the qualifying mentioned as present, but not a primary reason for selection of the Hoy SAC.  This habitat is found on sloping ground either side of the Burn of Ore in the south-west of the study area.	Local
Wet heath and blanket mire M15 <i>Trichophorum cespitosum</i> - <i>Erica tetralix</i> wet heath	M15 is a priority habitat on both the SBL and the Orkney LBAP. Wet heath is present throughout the study area. Wet heath is a potential GWDTE habitat (SEPA, 2017), but the assessment in Chapter 11 (Geology, Hydrology & Hydrogeology) concludes that wet heath at the site is at most only partly groundwater fed. Although this habitat was present throughout the study area some of the typical species such as <i>Erica tetralix</i> were not recorded in sections indicating much of the area of this habitat is degraded. As such it is considered of Local ecological value in the assessment.	M15 with runnels: Council  M15 without runnels: Local

Feature	Rationale for evaluation	Level of Importance
Blanket bog M1 <i>Sphagnum denticulatum</i> bog pool community / M17 <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire	M17 is listed as an Annex 1 blank bogs habitat, SBL priority habitat within blanket mire and is listed within the peatland priority habitat of the Orkney LBAP.  This Annex 1 habitat is degraded in areas throughout the site with over grazing of vegetation leading to poaching as well as sections of peat which have been cut with evidence of both recent and historical activity present.	M17 with M1: National  M17 without pools: Council
Acid flush M6 <i>Carex echinata</i> – <i>Sphagnum fallax</i> / <i>denticulatum</i> mire	Upland flushes are listed with a watching brief on the SBL. Flushes are also listed within the peatland priority habitat of the Orkney LBAP.	M6 associated with track drainage: Less than Local  M6 elsewhere: Local
Basic flush M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	Upland flushes are listed with a watching brief on the SBL. Flushes are also listed within the peatland priority habitat of the Orkney LBAP. M10 is mentioned in the Annex 1 habitat description for Alkaline fen. The assessment in Chapter 11 (Geology, Hydrology & Hydrogeology) concludes that M10 at the site is a GWDTE.	Council
Standing water	Concrete water storage containers with no ecological value.	Less than local
Running water	A single stream within the development area, the Burn of Longigill flows south into the Burn of Ore which flows east into the sea. The streams do not directly align with either SBL or Orkney LBAP priorities, but they are considered relatively pristine in character compared to streams on the Orkney mainland, which is dominated by agricultural activity and where most spawning burns have been ditched and straightened.	Local
Species-rich hedgerow with trees	A section of species-rich hedgerow was recorded making up the boundary of a garden in the east of the study area. Hedgerows are broadly outlined as SBL and priority habitat of the Orkney LBAP. However, it is of very limited extent and lacks	Less than local

Feature	Rationale for evaluation	Level of Importance
	connection to any similar habitat in the wider environment.	
Bare ground	Areas of hard standing (including entrance to underground tunnels) are considered to have no ecological value.	Less than local
Buildings	The stone buildings have negligible value to roosting bats.	Less than local
Fence	Post and wire fences are considered to have no ecological value.	Less than local
Private gardens	A small section of private garden was recorded in the east of the study area. The habitat has low ecological value.	Less than local
Otter	Otter is an EPS and is a priority species on the SBL and Orkney LBAP. Although no holts or hovers or other evidence of otter were recorded within the study area, the species is known to be present in the local area, and otters could on occasion move between watersheds in the Survey Area.	Local
Bats	Bat species are also EPS and priority species on the SBL and Orkney LBAP. Bats are concluded not to be roosting within the study area, with the local potential for commuting and/or foraging activity likely restricted to the coast of Hoy.	Local
Mountain hare	Mountain hare was observed within the site and wider study area. This is a priority species on the SBL and the Orkney LBAP.	Local
Fish	Burn of Longigill is too small for a resident sea/brown trout population, but both this species and European eel is present on Burn of Ore in the south of the study area. Sea trout is a priority on both the SBL and the Orkney LBAP.	Local
Grey seal	Two records were returned in the desk study over 1 km east of the site. An Annex 2 and Orkney LBAP species unlikely to be present in the study area.	Local
Odonata	Records of three Orkney LBAP species were recorded on site in July 2019.	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, including some embedded mitigation measures, certain IEFs of local or higher value can also be scoped-out of further consideration.

### **Scoped Out IEFs**

#### **Designated Sites**

8.8.2 Crockness LNCS lies over 900 m south-east from the nearest infrastructure, and the physical separation of the site by a road and Burn of Ore means there is a lack of connectivity between the designated habitat features and the site.

#### **Habitats**

8.8.3 Adverse impacts on habitats within the site 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, as well as indirect adverse impacts of mire, e.g. through changed hydrological conditions.

8.8.4 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.

8.8.5 Direct loss refers to the footprint of the infrastructure, while indirect effects refers to the disturbance zone around this infrastructure in damp or wet habitats, where a transitional habitat is likely to be formed between the infrastructure and the surrounding habitats. This zone has been defined as a worst-case 10 m buffer around the infrastructure elements of the Proposed Development (in practice, transition strips are likely to be reduced for drier vegetation types).

8.8.6 For clarity, Table 8.9 presents the areas of habitat loss by habitat type.

**Table 8.9 - Summary of Effects on Habitats**

Phase 1 habitat	NVC community or habitat types	Permanent loss (ha)	Temporary loss (ha)	Indirect effects (ha)
Coniferous woodland - plantation	n/a	<0.01	0	0
Mixed woodland - plantation	n/a	0	0	0
Improved grassland	n/a	0	0	0
Marshy grassland	M23 <i>Juncus effusus/acutiflorus</i> – <i>Galium palustre</i> rush-pasture	0	0	0
	M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire (on shallow peat)	0	0	0



Phase 1 habitat	NVC community or habitat types	Permanent loss (ha)	Temporary loss (ha)	Indirect effects (ha)
	M27 <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> tall-herb fen	0	0	0
Bracken	U20 <i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community	0	0	0
Non-ruderal	U16 <i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	0	0	0
Dry dwarf shrub heath	H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	0	0	0
Wet heath and blanket mire	M15 <i>Trichophorum cespitosum</i> - <i>Erica tetralix</i> wet heath with runnels	0	0	0
	M15 <i>Trichophorum cespitosum</i> - <i>Erica tetralix</i> wet heath without runnels	3.37	3.06	13.34
	M17 <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire with M1 <i>Sphagnum denticulatum</i> bog pools	0	0	0
	M17 <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire without bog pools	1.14	0.48	4.21
Flush and spring – acid and neutral	M6 <i>Carex echinata</i> - <i>Sphagnum fallax</i> / <i>denticulatum</i> mire	<0.01	0.08	0.23
	M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	0	0	0
Standing water	n/a	0	0	0
Running water	n/a	n/a	n/a	n/a
Species rich hedgerow with trees	n/a	0	0	0
Fence	n/a	n/a	n/a	n/a

Phase 1 habitat	NVC community or habitat types	Permanent loss (ha)	Temporary loss (ha)	Indirect effects (ha)
Buildings	n/a	n/a	n/a	n/a
Bare ground (including hardstanding)	n/a	0.06	<0.01	0
Private garden	n/a	0	0	0
<b>Total</b>		<b>4.58</b>	<b>3.63</b>	<b>17.55</b>

8.8.7 The following habitat IEFs have been scoped out of the assessment:

- Acid flush – All M6 *Carex echinata–Sphagnum fallax /denticulatum* mire not within 250 m of any site infrastructure is associated with track drainage and not considered to be GWDTE.
- Basic flush – M10 *Carex dioica - Pinguicula vulgaris* mire is located over 1 km west of the nearest infrastructure, and there will be no direct impacts on this feature.
- Marshy grassland - M27 *Filipendula ulmaria-Angelica sylvestris* tall-herb fen is located 800 m west and over 1 km south-east of the nearest infrastructure, and there will be no direct impacts on this feature.
- Tall ruderal - U16 *Luzula sylvatica-Vaccinium myrtillus* tall-herb community is located over 1 km south-east of the nearest infrastructure, and there will be no direct impacts on this feature.

8.8.8 The following species IEFs have been scoped out of the assessment:

- Bats – Bats are concluded not to be roosting within the study area, and their local presence is likely to be limited to commuting and/or foraging activity along the coast of Hoy which lies 1.3 km east of the nearest turbine. Activity in this area is likely to be limited and unaffected by the turbines.
- Otter – No evidence of otter was recorded within the study area, and the species is therefore unlikely to be affected by the Proposed Development.
- Grey seal – This is a marine species and not present within the zone of influence of the Proposed Development.
- Odonata – Sightings of the three species of conservation interest were made on Little Wee Fea pools adjacent to the existing track southeast of the proposed track to T2. Standard mitigation, including maintenance of hydrological flows and control of spillages, will mean that the pools are unlikely to be significantly affected by the Proposed Development.

### **Scoped In IEFs**

8.8.9 Based on the above the following IEF are brought forward for detailed assessment in relation to the Proposed Development:

#### **Designated sites**

- Hoy SAC / SSSI;

- Hoy and North Walls SSSI Moorland Fringes LNCS inclusive of the following habitat IEFs within the site:
  - Wet dwarf shrub heath - M15 *Trichophorum cespitosum*–*Erica tetralix* wet heath;
  - Blanket bog - M1 *Sphagnum denticulatum* bog pool community / M17 *Trichophorum germanicum* –*Eriophorum vaginatum* blanket mire.

#### **Species**

- Mountain hare; and
- Fish.

#### **Habitats**

- Dry dwarf shrub heath - H10 *Calluna vulgaris*-*Erica cinerea* heath; and
- Running water.

## 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 and the addition of passing places.
- The presence of potential GWDTEs has informed the site layout, which has maximised distances to such features as far as possible (see above). All confirmed GWDTEs are located over 250 m from the nearest 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 where practical.

#### ***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 and legally protected species are reduced:

- Pre-construction otter survey to establish if the species has established within the site in the intervening time and to devise mitigation to avoid significant impacts, if necessary.
- 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 as 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.
- Development of an otter and mountain hare-specific protection plan inclusive of:

- 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 10 mph speed controls within the Proposed Development site to limit the risk of road traffic accident mortality.
- Implementation of an exclusion zone of at least 30 m to be implemented around any new holt or resting place.
- In order to prevent impacts on fish and pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed.
- The stream crossing design, construction and micro-siting will incorporate suitable mitigation measures to avoid impacts on habitats and fish movements.
- Regular monitoring of turbidity and suspended solids within watercourses will be required during construction. The monitoring will include a responsive element, with an on-site ECoW checking areas where active works are taking place and areas where sediment run-off may be a concern during periods of high rainfall.
- 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***

#### **Designated Sites**

##### Hoy SAC / SSSI

- 8.10.1 The footprint of the Proposed Development does not overlap with the Hoy SAC and SSSI and there will therefore not be any direct impacts on the qualifying features. However, there is potential for indirect negative changes to the hydrological regime of the qualifying features, blanket mire and depressions on peat substrates, both of which require constant moisture. Drying of the underlying peat body, e.g. as a result of dewatering turbine excavations or from trackside drainage, can lead to an associated change in the blanket mire vegetation, both in terms of structure and species composition. Hoy SAC and SSSI is located approximately 190 m north-west of an access track at the closest point and 300 m south of the nearest turbine. With the closest section area either across level areas or on the opposite side of the Burn of Ore, the impacts of drying due to excavations is considered unlikely. Impacts caused by accidental spillage are also considered unlikely due to the lie of the land which slopes downhill into the Burn of Ore and then away from the SAC.
- 8.10.2 As per Table 8.8: Summary of IEFs Brought Forward in the Assessment, Natura sites have international value. The status of the qualifying features is currently assessed as 'favourable' for all qualifying features including blanket bog and wet heathland.
- 8.10.3 The SAC and SSSI cover an area of approximately 9051 ha. The development footprint is set back from the SAC boundary by at least 190 m and downslope of the SAC. Therefore, neither drainage impacts nor any accidental spillages are likely to affect habitats within the SAC.
- 8.10.4 Given the above consideration of sensitivity and magnitude, the effect significance is considered to be **barely perceptible** and Not Significant.

##### Hoy and North Walls SSSI Moorland Fringes LNCS

- 8.10.5 This designated site covers all of the study area and flanks the east of the Hoy SAC and SSSI discussed above. The LNCS measures 2265 ha and is designated for a number of habitats and species. The site

is designated for its blanket bog on deep peat and wet heather moorland as well as a number of bog plants and animal species.

- 8.10.6 The permanent habitat loss at the site is 4.58 ha, with temporary and indirect effects representing an additional 21.18 ha, or 0.2% and 0.94% of the LNCS area, respectively. The areas of habitat that will be lost to the Proposed Development do not include the high quality examples of very wet blanket bog and wet heath within the study area.
- 8.10.7 The majority of the habitat loss comprises wet heath and blanket mire and are discussed as part of the LNCS rather than as individual habitats.

*Wet heath and blanket mire - M15 Trichophorum cespitosum–Erica tetralix wet heath*

- 8.10.8 Both direct and indirect negative effects are likely on wet heath during the construction phase. There will be a direct loss of habitat during construction of the Proposed Development and indirect losses (through potential drying effect upon neighbouring bog habitats occurring from the construction period into the operational period).
- 8.10.9 M15 is a priority habitat on both the SBL and the Orkney LBAP. Wet heath is present throughout the study area. Wet heath is a potential GWDTE habitat (SEPA, 2017) although the hydrological assessment in Chapter 11 concludes that the wet heath habitat is likely to be predominantly rainwater fed. As such it is considered not to be a GWDTE habitat and of Local ecological value in the assessment.
- 8.10.10 As per Table 8.8, wet heath within the study area represents degraded blanket mire and is considered to be of no more than local value. In the 3rd UK Habitats Directive Report (JNCC, 2013) the conservation status of blanket bog status is listed as ‘Bad’ and ‘Declining’ at the UK level. The corresponding Scottish report (SNH 2013) does not include an assessment specifically for Scotland.
- 8.10.11 Scotland has an estimated 1,759,000 ha of blanket bog (SNH, 2013). Wet modified bog accounts for 193.4 ha of the study area, and most of this is comprised of M15 wet heath.
- 8.10.12 A total of 3.37 ha will be directly lost to the Proposed Development infrastructure (Table 8.9). Direct habitat loss due to permanent infrastructure is therefore predicted to be at most 1.74% of the wet modified bog within the study area. The direct loss of this degraded habitat is of a small extent in the local context. In addition to direct loss, there will be a temporary loss of 3.06 ha, representing a further 1.58% of the resource; however, the affected habitat is expected to recover post construction. There may also be indirect effects from drainage around infrastructure. If, as a worst-case scenario, indirect drainage impacts were fully realised out to 10 m in all wet modified bog areas, this would result in an additional 13.34 ha, thus increasing the overall predicted lost or changed habitat to 19.77 ha or 10.22% of the habitat within the study area. However, effects are likely to operate on a much smaller scale because habitats lost temporarily are likely to recover. In addition, drainage impacts are very unlikely to result in the entire wet heath/modified bog resource suffering drying impacts leading to habitat change, as drying impacts may not be significant enough to facilitate such change in some areas, and because other areas may have water diverted to them.

*Blanket bog - M1 Sphagnum denticulatum bog pool community / M17 Trichophorum germanicum – Eriophorum vaginatum blanket mire*

- 8.10.13 Both direct and indirect negative effects are likely on blanket bog during the construction phase., There will be a direct loss of habitat during construction of the Proposed Development and indirect losses (through potential drying effect upon neighbouring bog habitats occurring from the construction period into the operational period).
- 8.10.14 As per Table 8.8, blanket mire within the study area is relatively uniform and has a modest range of species, likely as a result of the same degrading factors, notably draining and grazing. As such it is considered to have no more than council value. In the 3rd UK Habitats Directive Report (JNCC, 2019) the conservation status of blanket bog status is listed as ‘Bad’ and ‘Declining’ at the UK level. The corresponding Scottish report (SNH 2013) does not include an assessment specifically for Scotland.
- 8.10.15 Scotland has an estimated 1,759,000 ha of blanket bog (SNH 2013). Blanket mire accounts for 245.0 ha of the study area, comprising M1 / M17 mire.

- 8.10.16 A total of 1.14 ha will be directly lost to the Proposed Development infrastructure (Table 8.9), representing 0.47% of the blanket mire within the study area. This direct loss is of a small extent in the local and regional context. In addition to direct loss, there will be a temporary loss of 0.48 ha, representing a further 0.2% of the resource; however, the affected habitat is expected to recover post construction. There may also be indirect losses associated with the zone of drainage around infrastructure. If, as a worst-case scenario, indirect drainage impacts were fully realised out to 10 m in all areas of blanket mire, this would result in an additional loss of 4.21 ha blanket mire, thus increasing the overall predicted lost or changed habitat to 5.83 ha or 2.38% of the habitat within the study area. However, effects are likely to operate on a much smaller scale because habitats lost temporarily are likely to recover. In addition, drainage impacts are very unlikely to result in the entire blanket bog resource suffering drying impacts leading to habitat change, as drying impacts may not be significant enough to facilitate such change in some areas, and because other areas may have water diverted to them.
- 8.10.17 The adoption of standard good practice and environmental management techniques, as well as an appropriate and considered drainage design, will further reduce the risk of impacts.

#### *Conclusion*

- 8.10.18 The direct and temporary losses to the Proposed Development, as well as the potential drying impacts of part of the resource is considered to result in a **Medium** adverse effect, Significant on the council area scale.

#### **Species**

##### Mountain hare

- 8.10.19 Up to two mountain hares were noted on site on each day during the habitat survey. Estimating the density of mountain hares is very difficult; numbers are likely to be higher in areas of deep heather than the wetter habitats close to the site infrastructure. Hares are likely to move away from construction noise, and the probability of collisions with construction vehicles is considered to be very low, and will be further reduced by the embedded mitigation measures, such as speed limits and the provision of exit ramps from excavation works. There would therefore be an immediate **low** and reversible adverse effect on mountain hare and the effect would therefore be Not Significant.

##### Fish

- 8.10.20 The single watercourse within the development footprint, the Burn of Longigill, was assessed as being unsuitable for the presence of brown trout or other protected species of fish, owing to its small size. It also goes underground in sections. However, it is a tributary of the Burn of Ore where brown trout and European eel were recorded.
- 8.10.21 A single watercourse crossing is needed over the Burn of Longigill, which is close to the source of the burn. There will be no fish habitat lost to pipe culvert installation. Potential impacts on fish species are therefore limited to possible accidental spillages and the siltation of the downstream environment, although the implementation of the embedded mitigation, such as appropriate timing of any work to avoid spawning periods and the time when eggs are incubating in gravel – approximately the period between October and March, as part of a CEMP is likely to reduce these risks to a minimum.
- 8.10.22 Therefore, overall there will be an immediate low magnitude of impact, **barely perceptible** short-term adverse effect and the effect would therefore be Not Significant.

#### **Habitats**

##### Dry dwarf shrub heath - H10 *Calluna vulgaris*-*Erica cinerea* heath

- 8.10.23 There are no direct impacts expected on dry dwarf shrub heath habitat during construction as the nearest section of this habitat type lies approximately 40 m away from the nearest infrastructure and 80 m from T4. Indirect negative effects are possible in the form of damage from machinery and accidental spillages. The latter is unlikely to be a significant effect owing to the embedded mitigation

measures. However, in the absence of further mitigation, loss of dry heath from construction machinery damage is possible.

8.10.24 H10 is listed as an Annex 1 habitat, SBL priority habitat and is listed within the peatland priority habitat of the Orkney LBAP. H10 is one of the qualifying features mentioned as present, but not a primary reason for selection of the Hoy SAC.

8.10.25 Although the impact to this Annex 1 habitat is likely to be of limited extent and temporary in nature, the effect is considered to be **Medium** and Significant.

#### Running water

8.10.26 A single burn flows out of the development area flowing into the Burn of Ore catchment which flows east into the sea. As an SBL and LBAP habitat, all water courses have been considered within the iterative design process.

8.10.27 The only watercourse that requires crossing is the Burn of Longigill, which was outlined as not being suitable habitat for fish species such as brown trout, being too small and going underground in sections. There will be no fish habitat lost to pipe culvert installation. Impacts on running water and fish species will therefore be limited to damage to the bed substrate during construction and siltation of the watercourses downstream, although the implementation of a CEMP will reduce these risks to a minimum.

8.10.28 Therefore, overall there will be an immediate low magnitude of impact, **barely perceptible** short-term adverse effect and the effect would therefore be Not Significant.

### **Operation**

#### **Designated Sites**

8.10.29 Owing to the Proposed Development being set back by at least 190 m and also downslope of the Hoy SAC and SSSI, no significant effects, e.g. from drying impacts, are likely during the operational phase of the wind farm. An assessment of **no impact** therefore applies during the operational phase.

8.10.30 All likely direct and indirect effects on wet heath and blanket mire (and therefore Hoy and North Walls SSSI Moorland Fringes LNCS) have also been considered in the construction effects section above. Indirect habitat losses from drying of peat will commence when drains are first installed during the construction phase and then continue during the operation phase; the moment when vegetation change and drying impacts may become measurable is difficult to predict but may be delayed and therefore not occur until the operational phase. However, for completeness and ease of assessing impacts, they have been considered together in the construction effects section. No further negative impacts on wet heath and blanket mire are predicted during the operational phase.

#### **Species**

##### Mountain hare

8.10.31 Site activity during operation will be low with routine maintenance checks (involving a single vehicle driving on the hard standing tracks once or twice a month) and any maintenance work being the only activity. Given the low level of vehicle activity during operation and the site imposed speed limits possible collision with maintenance vehicles is very unlikely to be significant.

8.10.32 Operational impacts of the Proposed Development on the behaviour of mountain hare in this area are considered to be a **barely perceptible** adverse and the effects are considered to be Not Significant.

### **Decommissioning**

8.10.33 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, Compensation and Enhancement

8.11.1 A habitat protection plan will be developed that will include demarcation of no-go areas in sensitive habitats, such as dry heath, high quality wet heath and blanket bog, and pools.

8.11.2 As described in Appendix 8.5 (Outline Habitat Management Plan), blanket bog restoration is proposed for degraded areas both on-site and at an off-site location in the control of the Applicant. In both cases, peat cutting has been the main reason for degradation of the blanket bog habitat, although one of the on-site locations is an engineered feature of mineral soil within peatland. There have been likely additional effects from livestock grazing and poaching. Restoration will be done through a combination of re-instating the peatland topography, and therefore increase the groundwater level, by using peat excavated for the Proposed Development, and through control of grazing and peat cutting. Hag-profiling may also be undertaken at the off-site location. Monitoring will be undertaken to assess the efficacy of the management and to identify additional management measures which could be required to achieve the objectives, in line with best practice. The restoration and monitoring methods will be based on standard approaches used successfully elsewhere and key stakeholders, notably SNH, SEPA and Orkney Islands Council, will be able to feed into the final restoration proposals. Because the HMP areas already contain peatland habitat, albeit in a degraded state, the benefit of the restoration management is not simply the cover of the HMP areas. As described in Appendix 8.5, by assessing the current condition of the peatland habitats within the HMP areas it is possible to quantify the degree of improvement which will be made to these areas through restoration. For example, if 10,000 m<sup>2</sup> of Class 2 blanket bog is present (which is defined as having 75% of the 10,000 m<sup>2</sup> habitat in target condition, i.e. 7,500 m<sup>2</sup>), the benefit of restoring the area would potentially amount to 2,500 m<sup>2</sup>. The restoration areas within the site boundary cover 1.5 ha and those off site cover 40 ha. By improving the condition of the degraded blanket bog, the restoration management will result in restoration benefits of 10,244 m<sup>2</sup> within the site boundary and 275,151 m<sup>2</sup> in the off-site location; or a total benefit of 28.5 ha overall from bringing 41.5 ha of blanket bog into target condition. This compensates for the 19.77 ha that is predicted to be lost to the Proposed Development.

## 8.12 Residual Effects

8.12.1 With implementation of the specific mitigation measures described in Sections 8.9 and 8.11, all impacts would reduce to **barely perceptible** and no significant residual effects are predicted during construction or operation on all IEFs.

## 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.

**Table 8.10 – Wind Farms over 50 m within 40 km of the Proposed Development**

Name	Status	Distance (km)	Direction
Costa Head	Approved	35	N
Burgar Hill	Operational	32	N
Evie Hill	Application	31	N
Hammars Hill	Operational	29	N
Howe Community Wind Turbine	Operational	32	NE
Crowness Buisness Park (Hatston)	Operational	26	NE
Orkney's Community Wind Farm Project - Quanterness	Application	22	NE
Rennibister	Operational	21	NE
Upper Stove	Operational	31	NE
Barns of Ayre	Operational	31	NE
Akla	Approved	14	N
Swanbister	Operational	13	N
New Holland	Approved	22	NE
Northfield (Burray)	Operational	19	E
Southfield	Operational	19	E
Berriedale	Operational	16	E
Hesta Head	Approved	16	E
Herston Head	Operational	11	E
West Hill	Operational	5	E
Ore Brae Community Turbine	Operational	<1	E/SE
Forss	Operational	33	SW
Weydale	Approved	29	SW

Name	Status	Distance (km)	Direction
Taigh Na Muir	Operational	18	S
Lochend Holdings	Operational	20	S
Hill of Stroupster	Operational	24	S
Mid Kirk	Application	31	S
Tresdale	Application	20	S
Cogle Moss	Application	34	S

8.13.4 There are a total of 28 other known operational and proposed wind energy developments of over 50 m to tip within 40 km of the Proposed Development, nineteen in Orkney and eight in Caithness (See Table 8.10).

8.13.5 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. Of the 28 known developments there is only one on Orkney within 10km of the Proposed Development:

- Ore Brae Community Turbine is a single turbine project directly south-east of the proposed development.

8.13.6 The small scale of this development comprising only one turbine means that there are not considered to be any in-combination impacts with the Proposed Development and its terrestrial ecology and other wind farms.

## 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 (EclA). 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: Extended NVC habitat survey, otter and fish survey.

8.14.2 A single statutory designated area, Hoy SAC and SSSI, is located immediately to the west of the western site boundary. No other statutory area designation for ecological features is present within 5km of the site.

8.14.3 The Proposed Development is located within the Hoy and North Walls SSSI Moorland Fringes LNCS. A second LNCS, Crockness LNCS, is located directly east of the Proposed Development.

8.14.4 The primary habitats (listed in order of size) identified on site are currently: Blanket bog, Wet dwarf shrub heath, Dry dwarf shrub heath, Bracken, Coniferous woodland – plantation, Marshy grassland, Bare ground (including hardstanding) and Flush and spring – acid and neutral. A number of small water bodies are present within the study area all associated with blanket bog habitats except a concrete reservoir.

8.14.5 Only mountain hare and protected fish (brown trout and European eel) presence was recorded during surveys. With further mitigation detailed, residual impacts for construction and operation phases on species are considered to be **barely perceptible** adverse and therefore no significant effects are anticipated.

- 8.14.6 Habitats indicative of potential groundwater dependence were determined following the NVC survey, although the water catchment is considered likely to be predominantly surface water or rain fed partly due to the wider network of blanket bog habitats (which, by definition, are fed by precipitation) as well as the underlying geology being uncondusive to groundwater flow. Hydrogeology mapping data from the British Geological Society shows the bedrock beneath the study area to comprise a low productivity aquifer.
- 8.14.7 Of the features carried forwards to be assessed in terms of impacts, all likely direct and indirect effects on the Hoy and North Walls SSSI Moorland Fringes LNCS and Blanket bog, Wet dwarf shrub heath were considered.
- 8.14.8 Direct and indirect habitat losses due to land take and as a result of drying peat are anticipated during the construction phase and then considered likely to continue during the operation phase. No further negative impacts are predicted during the operational phase. Overall, the permanent habitat loss to the Proposed Development is 4.58 ha, of which 3.37 ha comprises wet heath/modified bog and 1.14 ha comprises blanket mire. An additional 3.06 ha of wet heath/modified bog and 0.48 ha of blanket bog will be temporarily lost or disturbed during the construction process, but these will be restored subsequently. There is an additional potential for drying of peatland habitats from site drainage; as a worst case scenario these impacts may affect 13.34 ha of wet heath/modified bog and 4.21 ha of blanket bog, although effects are very unlikely to operate on that scale. None of the impacts listed above will affect high-quality examples of very wet blanket bog and wet heath. Nevertheless, these worst-case habitat effects will be compensated for through blanket bog restoration, which will be delivered through an HMP. As mentioned in Section 8.11.2, the proposed HMP will deliver a restoration benefit of 28.5 ha by turning degraded blanket bog over 41.5 ha of land into target condition. The HMP areas are in the control of the Applicant. As outlined in Appendix 8.5, restoration methods will be based on standard approaches used successfully elsewhere and key stakeholders, notably SNH, SEPA and Orkney Islands Council, will be able to feed into the final restoration proposals. As such, an overall improvement in the quality of the blanket bog habitat will take place during the operational phase.
- 8.14.9 Likely cumulative effects of nearby developments, consented or at application stage, were also considered; no significant cumulative effects are anticipated.
- 8.14.10 The assessment concludes that there will be no significant residual effects on any of the terrestrial ecological interests of the site, resulting from the construction and operation of the Proposed Development.

**Table 8.11 – Summary of Effects**

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Loss/Drying effect on habitat: Hoy and North Walls SSSI Moorland Fringes LNCS and associated habitats wet modified bog and blanket mire	Medium and Significant	Adverse	Standard in-built mitigation (i.e. 50 m watercourse buffer) and adoption of good practice and CEMP.  ECoW advising on micro-siting requirements to ensure impacts on modified bog are reduced further where possible.  HMP will be implemented during the construction and operation phases that will focus on restoration of blanket bog within the site and at an off-site location.	Barely perceptible and Not Significant	Beneficial
Loss of habitat and disturbance to mountain hare	Barely perceptible and Not Significant	Adverse	Implementation of Species Protection Plan.	Barely perceptible and Not Significant	Adverse
Mortality to mountain hare	Low and Not Significant	Adverse		Barely perceptible and Not Significant	Adverse
Loss of habitat and disturbance to fish species	Barely perceptible and Not Significant	Adverse	Implementation of CEMP.	Barely perceptible and Not Significant	Adverse

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Mortality to fish	Low and Not Significant	Adverse		Barely perceptible and Not Significant	Adverse
Running Water	Barely perceptible and Not Significant	Adverse	Implementation of CEMP.	Barely perceptible and Not Significant	Adverse
Dry dwarf shrub heath	Medium and Significant	Adverse	Implementation of CEMP and demarcation of sensitive areas during construction.	Barely perceptible and Not Significant	Adverse
<b>Operation</b>					
Mortality to mountain hare	Barely perceptible and Not Significant	Adverse	Implementation of Species Protection Plan.	Barely perceptible and Not Significant	Adverse

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