Orkney's Community Wind Farm Project - Hoy

Design and Access Statement

September 2020

ITPENERGISED
Earth. Smart. Solutions

ORKNEY
ISLANDS COUNCIL

Design and Access Statement

Contents

1	Introduction and Background	1
2	Background Information	1
3	Site Details	2
4	Site and Area Appraisals	4
5	Design Principles	5
6	Public/Community Involvement	13
7	Programme	13
8	Design Solution	14
9	Conclusion	15

This page is intentionally blank.

1 Introduction and Background

1.1 Background

1.1.1 This Design and Access Statement (DAS) describes the design process and the resultant development proposals for the Orkney Community Wind Farm Project – Hoy (the Proposed Development), located 1.3 km west of Lyness on the island of Hoy. The DAS accompanies the planning application submitted to Orkney Islands Council (OIC) seeking permission to construct and operate the Proposed Development.

1.1.2 The purpose of this DAS is to provide information on the principles and approach that have guided the design process. This DAS demonstrates how the site and its surroundings have been fully assessed to ensure that the final design solution is the most suitable for the site. It describes the starting point for the Proposed Development design, and subsequent alterations to the layout that were made in response to the issues that were identified through the consultation and appraisal process. Details are also provided on the access arrangements to the site.

1.1.3 This DAS should be read in conjunction with the *Environmental Impact Assessment Report* (EIA Report), which also contains information on the design strategy (Chapter 2), predicted landscape and visual effects (Chapter 6), traffic and access related effects (Chapter 12), and includes a Transport Assessment (Appendix 12.1).

1.1.4 *The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013* requires a DAS to be prepared in support of all 'national' and 'major' developments. As the Proposed Development is expected to have a total installed capacity of approximately 28.8 megawatts (MW), it will be considered a 'major' development. Planning guidance notes on Design and Access Statements have been taken into consideration when preparing this DAS, notably Planning Advice Note (PAN) 68. PAN 68 states that a DAS should include:

- background information;
- site details;
- site and area appraisals;
- design principles;
- public involvement;
- programme; and
- design solution.

2 Background Information

2.1 Name of the Scheme

2.1.1 The Proposed Development is called Orkney's Community Wind Farm Project – Hoy

2.2 The Applicant

2.2.1 The Applicant is Orkney Islands Council who are looking to develop three wind farms within the Orkney Islands, of which the Proposed Development is one. 'Orkney's Community Wind Farm Project' would generate significant income and community benefit for Orkney. All profit would stay in the islands, enabling the Applicant to preserve and enhance key services that local people value and depend upon and providing a foundation for communities to drive transformational projects of their own.

2.2.2 A Local Authority taking the decision to become a developer of wind energy projects is unusual, but it is felt vital that the Applicant now takes an active 'developer approach' to energy projects in Orkney. Not only does this allow the Applicant to maximise the resources available to them in the

islands to support services and projects for local people at a time of significant central funding reductions, but it also allows them to contribute significantly and in a meaningful way to allow Orkney's world-renowned local energy industry to survive and thrive through a new grid connection.

2.2.3 Orkney Islands Council (OIC) has therefore taken a number of decisions leading to the decision to become a developer of onshore wind farms in Orkney:

- As early as September 2013 OIC endorsed the principle of establishing, developing or investing in an onshore wind farm project.
- At the OIC Policy and Resources committee meeting of 21st June 2016 OIC approved the principle of OIC assuming the role of a project developer of onshore wind farm projects in Orkney.
- At general meeting of the OIC on 4th July 2017, OIC resolved that a process should be undertaken to identify property owners in Orkney with large sites able to accommodate scale wind generation who would wish to sell or lease land for the purpose of a wind development.
- At the OIC Policy and Resources committee meeting of 28th November 2017 it was recommended that OIC proceed to planning consent stage with development of a project on Hoy, at a maximum scale of approximately 108 MW.
- At the general meeting of the OIC of 5th March 2019 it was agreed that OIC should focus on developing all projects which have a realistic chance of achieving planning permission by the end of 2020 and therefore contributing to the Needs Case for a new grid connection to Orkney, namely Hoy, Faray, and Quanterness.

2.3 Advisors

2.3.1 The Applicant appointed ITPEnergised to undertake the environmental impact assessment and advice on the design of the Proposed Development. ITPEnergised have been supported by the following technical teams:

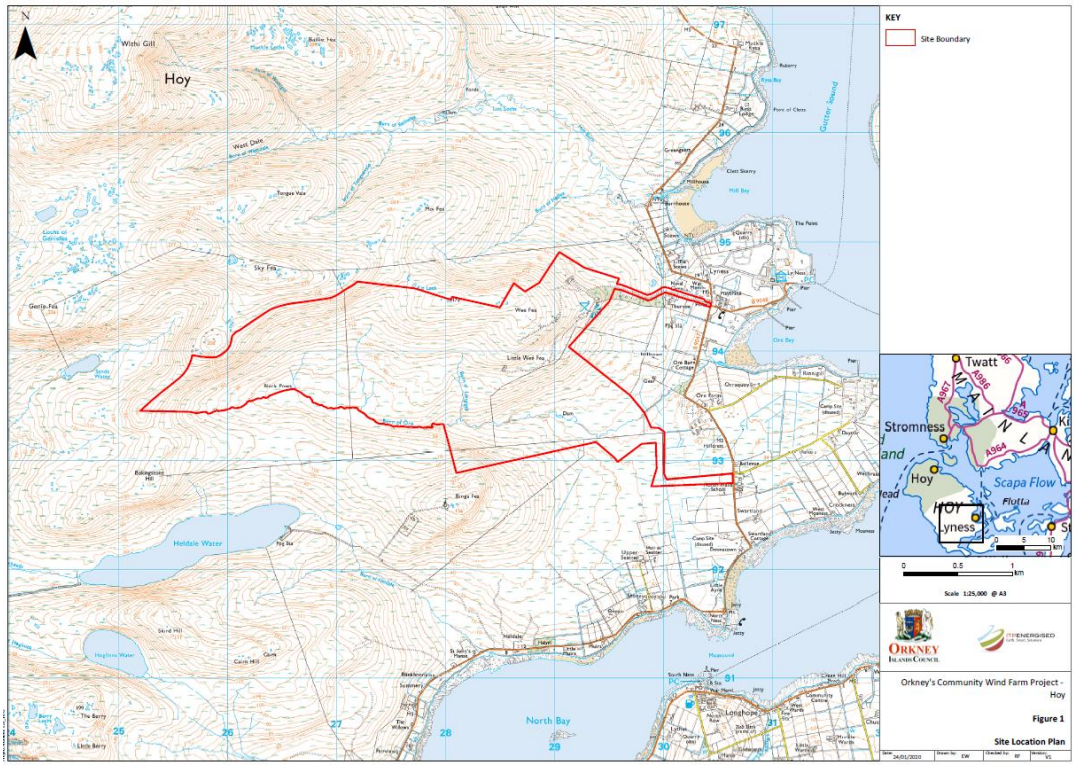
- Jones Lang Lassalle (JLL) (planning policy);
- OPEN (landscape and visual);
- Aquatera & Firth Ecology (ornithology);
- AOC Archaeology (cultural heritage and archaeology);
- Pell Frishmann (transport, traffic and engineering);
- BiGGAR Economics (socio-economics and tourism);
- Wind Business Support (aviation and radar);
- Oldbaum (wind resource measurement and analysis); and
- TNEI (independent technical advice).

3 Site Details

3.1 Location and Site Plan

3.1.1 The Proposed Development site is located approximately 1.3 km west of Lyness on the east of the island of Hoy (refer to Figure 1).

Figure 1: Site Location



3.2 Description

3.2.1 The site lies within a sloping landscape with a ridge running its full northern extent at an elevation of approximately 180 m AOD. The site drops to elevations of approximately 10 m AOD at the eastern extents of the Burn of Ore and the access track. The land to the south of the site rises back up to c.150 m AOD at Binga Fea.

3.2.2 The land is used for low quality rough grazing. There is also evidence of peat cutting in the north-central site area.

3.2.3 The Burn of Ore flows from west to east across the southern extent of the site, with three small tributaries joining from the north.

3.2.4 There are no residential properties within the site boundary. The closest dwelling is Thurvoe c.950 m east of the nearest proposed turbine.

3.3 History

3.3.1 The site has been historically (and is currently) used for low quality rough grazing, with evidence of peat cutting in the north-central site area.

3.3.2 The eastern part of the site was utilised during the Second World War and includes a large underground fuel stores and the Former Navel Head Quarters and Communications Centre. Other evidence of WWII activity in the form of upstanding concrete structural remains and earthworks of defensive positions is still evident.

3.3.3 There are no confirmed prehistoric remains or early historic remains or artefacts within the 1 km study area. In addition, there are no confirmed medieval or post-medieval remains or artefacts recorded on the site.

3.4 Ownership

3.4.1 The main body of the site is owned partly by the Applicant and partly by a private landowner with whom the Applicant has a lease agreement.

4 Site and Area Appraisals

4.1 Site Search

Broad Site Identification and Selection

4.1.1 In response to the OIC decision to seek landowners with an interest in selling or renting land for wind farm development an Expressions of Interest (EoI) process was undertaken in August and September 2017 requesting landowners to get in touch with OIC. A number of responses were received, and each was assessed against defined criteria and compared against other sites received, and sites within OIC ownership.

4.1.2 The outcome of this process was the decision to focus on development of a project of up to 108 MW on Hoy.

4.1.3 Initial baseline survey work at a potential large-scale site which would potentially deliver the entire 108 MW capacity was undertaken in 2018 however based on preliminary findings it was considered that a single development of that scale was unlikely to be achievable in Orkney. A process was therefore undertaken in late 2018 to assess the whole of Orkney for the potential for onshore wind farm development at a smaller scale, which could, in combination, provide the required capacity to support the Needs Case.

4.1.4 This was done by buffering address point data and plotting international designated sites on a map and identifying those areas which were of sufficient size to host a wind farm and were not constrained by either of those limitations. Each site was then investigated in further detail to identify any additional potential constraints. A short list of sites was drawn up and a full assessment of suitability was undertaken, the results of which were used to inform a report to OIC.

Hoy Specific Site Identification

4.1.5 The land on Hoy was identified as a potentially suitable development site, and further work was undertaken to establish feasibility of development and the potential scale and capacity of potential wind energy generation at the site.

4.1.6 The Hoy site was therefore considered alongside responses from the 2017 EoI process (refer to paragraph 4.1.1) and subsequent wider work was undertaken in 2018 to identify suitable sites for development.

4.1.7 In conjunction with the OIC decision on 5th March 2019, to focus on developing all projects which have a realistic chance of contributing to the Needs Case for a new grid connection to Orkney, Hoy was selected for progression towards an application for planning permission, alongside sites at Quanterness and Faray.

4.1.8 Numerous surveys were undertaken on-site which have contributed to the various design iterations detailed in Chapter 2 (Design Iterations) culminating in the design detailed in Chapter 3 (Proposed Development).

4.2 Area Appraisal

Residential Receptors

4.2.1 There are no residential properties within the site boundary. The closest dwelling is Thurvoe c.950 m east of the nearest proposed turbine.

Landscape Context

4.2.2 The site is located on the island of Hoy, the second largest island in the Orkney archipelago, and situated to the south-west of the Mainland of Orkney. Hoy is famous for its dramatic coastal scenery, comprising cliffs over 300 m AOD in height and the Old Man of Hoy, which at 137 m AOD, is the highest stack in the British Isles. Although the hills on Hoy are relatively small, they are the highest

in Orkney and present a dramatic feature, especially the rugged hills located across the north of the island.

4.2.3 At 479 m AOD, Ward Hill is the highest hill on the Orkney Islands. It is set in the north of Hoy and along with the Cuilags (433 m AOD) to the north and the coastal hills, including St John's Head (378 m AOD) forms a prominent group of hills, separated by the central and southern parts of the island by a deep glacial valley which is aligned from Quoyness on the east coast to Rackwick on the west coast. To the south of this valley, the moorland hills merge to form a broad, undulating upland plateau, which is incised by a series of burns which either flow off the hills into the deep valley to the north, or to the coastal edges to the west or east. Knap of Trowieglen at 399 m AOD, is the highest hill in this group in which most of the hills are characterised by their relatively low and rounded profiles.

4.2.4 There is a distinct contrast between the high cliffs of the western and northern coastal edge and the lower cliffs and bays of the eastern coastal edge, with settlement mostly concentrated on the lower headlands and sheltered bays of the east coast, with the majority of the approximate 400 population in Lyness and Longhope. While development is typically small scale and rural, the history of Lyness as a naval base has left visible remnants in the landscape of larger scale developments.

4.2.5 The site occupies an area in the south-east of the island, set in the transition between the uplands and the coastal edge. It occupies the southern slopes of Wee Fea (173 m AOD) which lie to the north of the valley of the Burn of Ore and Binga Fea (154 m AOD). Although only a small hill, Wee Fea forms a prominent feature in the local landscape. The site lies to the west of the settlement of Lyness and the B9047 which follows the eastern coastline to the north and south.

4.2.6 While there are no operational wind farms within a 20 km radius of the Proposed Development, there are three operational commercial scale single turbines and two consented commercial scale single turbines in this area. Ore Brae is the closest of the single turbines, set at the south-eastern base of Wee Fea, while the West Hill turbine is located 6 km to the east on Flotta. The single turbine at Northfield lies out on Burray at a range of 20 km, while the consented turbines, Akla and Berriedale, are located 14 km to the north-east and 17 km to the east, respectively. There is also a large scale oil terminal on nearby Flotta, ferries and other vessels on the water and often large rigs stationed in Scapa Flow.

Transport and Access

4.2.7 Access to the site would be taken directly from the existing access track which would be widened and improved to enable HGV and turbine load access. The access track would be re-surfaced and re-constructed to adoptable standards (within the current limits of road adoption). The section leading into the wind farm site would be surfaced for the first 20 m in the interests of keeping the remaining road clear of mud and site debris.

Public Access and Pathways

4.2.8 There are no specific rights of way recorded by Orkney Islands Council near the Proposed Development. The B9047 and B9048 do not have any dedicated pedestrian or cyclist infrastructure.

4.2.9 Core Path H7 (Wee Fea) connects the junction of the B9047 and B9048 with the former naval buildings at Wee Fea.

4.2.10 The areas with the highest pedestrian use are in the vicinity of the ferry terminal and the Scapa Flow Museum, located to the west of the ferry terminal.

4.2.11 A review of the Sustrans cycle network plan of the United Kingdom indicates that there are no recommended National Cycle Routes (NCR) within the study area on Hoy. The A964 between Kirkwall and Kirkbister is part of NCR 1.

5 Design Principles

5.1 Introduction

5.1.1 As part of the EIA process design iterations were prepared and considered for the turbine locations and on-site ancillary infrastructure. In order to propose a development layout which is considered to represent the most appropriate design; potential environmental impacts and their effects, physical constraints and project economics were taken into account. Information was collated from desktop information, field surveys, scoping opinions, local planning policy, planning conditions and recent case law. This information provided the baseline from which site issues and sensitivities could be identified and highlighted for further detailed assessment and given priority in influencing the layout iterations of the Proposed Development. The design evolution process is described in detail below.

5.2 Environmental Constraints and Opportunities

5.2.1 The design of the Proposed Development took into consideration the following environmental constraints and opportunities.

Opportunities

Planning Policy

5.2.2 There are no planning policies which, in principle, preclude wind energy development. The development footprint is partially located within an 'Area with Potential for Wind Farm Development' and partially within an 'Area of Significant Protection' as defined by the Spatial Strategy Framework for windfarm development (OIC, 2017). The 'Area of Significant Protection' relates to the Wild Land Area at the western extent of the development footprint and mapped Class 1 Peat covering large parts of the site. The Supplementary Guidance includes explanation on the meaning of the above terms, as noted below.

5.2.3 'Areas with Potential for Wind Farm Development' represent *"the areas of least constraint to wind energy development. Wind energy development is likely to be supported in principle within these areas…"*

5.2.4 Wind farm developments within an 'Area of Significant Protection' *"may be supported when a proposal complies with the Development Criteria from Supplementary Guidance: Energy and where it can be demonstrated by the applicant that any significant effects on the qualities of these areas can be overcome by siting, design or other mitigation"*.

5.2.5 The Proposed Development is **not** within any areas that have been defined within the Spatial Strategy Framework as *"Areas where wind farms are not acceptable"*.

Wind Resource

5.2.6 The Orkney Islands are one of the windiest places in the United Kingdom (Met Office, 2019). The average wind speed across the development footprint is c.8.5 m/s at 45 m elevation (DECC, undated). This is substantially above the UK average of 6.8 m/s (DECC, undated).

Access

5.2.7 The Proposed Development site has good transport links with direct access to a main road and a short transport distance to the port at Lyness.

5.2.8 The road network allows for the delivery of large components, ensuring that the turbines can be of a scale that makes the best use of the excellent wind resource.

Land Use

5.2.9 The site is currently used as low quality rough grazing land. The loss of land to the Proposed Development footprint would not impact upon the agricultural requirements of the landowner.

Separation from Residential Properties

5.2.10 There are **no** residential properties within the site boundary. The closest dwelling is Thurvoe c.950 m east of the nearest proposed turbine.

Separation from Watercourses and Private Water Supplies

5.2.11 Only a single watercourse crossing (Burn of Longigill) is required and there are no Private Water Supplies within 1 km of the Proposed Development.

Designations

5.2.12 Within the site boundary, there are **no** National Parks, National Scenic Areas (NSA), World Heritage Sites (WHS), Natura 2000 and Ramsar sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Sites identified in the Inventory of Gardens and Design Landscapes, or Sites identified in the Inventory of Historic Battlefields.

Constraints

5.2.13 It is important to note that the identification of a constraint does not necessarily result in the exclusion of that area from the potential development envelope; rather it means that careful thought and attention was paid to the constraint and the design altered appropriately.

Topography

5.2.14 Turbines have been located so as to avoid the steepest areas of the site where practical to do so. Slope stability and peat slide risk has been considered throughout the site design process.

Landscape and Visual

5.2.15 The design of the wind farm layout is a vital part of the EIA process, as it is the stage where the biggest contribution can be made to mitigate potential effects. Due to the generally high visibility of wind farms, landscape and visual aspects are particularly important, and as such have played a key role in the design process.

5.2.16 The site is located on the southern margin of the Hoy Wild Land Area (41) (WLA) with five of the six turbines located outside the boundary. The Hoy and West Mainland National Scenic Area (NSA) is located c.5.2 km to the north.

5.2.17 The final turbine layout has been optimised to minimise landscape and visual effects as far as possible.

5.2.18 Further detail, and the full assessment of landscape and visual effects, are presented in Chapter 6 (Landscape and Visual).

Ornithology

5.2.19 Ornithology has had a major influence on the site design. In response to surveys that have been undertaken, the number of turbines has been reduced from 30 to 6. In addition, the turbine locations have been optimised as far as possible to minimise potential effects and ensure appropriate separation from any protected nest locations.

5.2.20 The full assessment of effects on ornithological receptors is presented in Chapter 7 (Ornithology).

Ecology

5.2.21 An ecological desk study was undertaken to confirm the presence of any statutory and non-statutory nature conservation sites and legally protected species. Field surveys including a National Vegetation Classification (NVC) survey, an otter survey and fishery studies then took place.

5.2.22 The Important Ecological Features identified by the ecological assessment works 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. The presence, nature and (where applicable) distribution of these features has been taken into account in design iteration, with a view to minimising impacts on these receptors.

5.2.23 The full assessment of effects on ecological receptors is presented in Chapter 8 (Ecology and Nature Conservation).

Noise

5.2.24 During 2019 background noise monitoring was undertaken at noise sensitive receptors. These were selected and agreed with OIC Environmental Health Officer as being representative of the noise sensitive receptors located closest to the Proposed Development. Using the background noise measurements and noise characteristics of a suitable candidate turbine model, noise modelling was undertaken to allow consideration of noise impacts on local receptors, in the design iteration process.

5.2.25 Applying design criteria in respect of turbine locations and potential models and modes of operation ensures that no exceedances of acceptable noise levels (determined based on relevant policy and guidance) will occur for the Proposed Development.

5.2.26 Noise is assessed in Chapter 9 (Noise).

Cultural Heritage

5.2.27 There are 163 non-designated heritage assets and two Category A Listed Buildings on-site, the majority of which date to military activity from the Second World War. The Proposed Development has been designed to avoid direct impacts upon these assets where possible, and to minimise the effect on setting of these and other nearby heritage assets.

5.2.28 The full assessment of cultural heritage effects is presented in Chapter 10 (Cultural Heritage).

Geology, Peat, Hydrology and Hydrogeology

5.2.29 A 50 m buffer has been applied to surface watercourses, and no turbines or other infrastructure have been sited within that buffer apart from a single water crossing (the Burn of Longigill).

5.2.30 Site geology comprises Upper Old Red Sandstone sedimentary strata. This is overlain by peat across most of the site area, with depth varying from nil to locally over 3 m. In parts of the site, there is evidence of recent and older peat cutting, and other localised disturbance or excavation associated with historical wartime structures.

5.2.31 The site has been designed to avoid the areas of deepest peat and minimise peat slide risk where possible. In addition, a Habitat Management Plan (HMP) will look to utilise excavated peat to restore degraded areas of blanket bog in the local area. Further details are provided in Chapter 8 (Ecology).

5.2.32 An analysis of impacts on peat associated with the Proposed Development is presented in Chapter 11 (Geology, Hydrology and Hydrogeology) of the EIA Report and Appendices 11.1 and 11.2.

Shadow Flicker

5.2.33 The Update of UK Shadow Flicker Evidence Base (DECC, 2011) reviews international legislation relating to the assessment of shadow flicker for wind turbine development and concludes that the area within 130 degrees either side of north from the turbine, and out to 10 rotor diameters, is for a suitable study area for the assessment of shadow flicker effects, within which significant flicker may be experienced. The potential for flicker to impact local residential receptors has been considered in the design iteration process, and flicker effects have been assessed as non-significant.

5.2.34 Shadow Flicker is assessed in Chapter 15 (shadow Flicker).

Telecommunications

5.2.35 Consultation with OFCOM and BT identified a number of telecommunication links in the vicinity of the Proposed Development. A suitable buffer distance was agreed with BT and adhered to during the design process.

5.2.36 Effects on telecommunications links are assessed in Chapter 16 (Other Issues).

5.3 Design Principles

5.3.1 Taking into consideration the above constraints and opportunities, the following principles were adopted during the design iterations undertaken by the Applicant to ensure that the final design of the Proposed Development was the most suitable for the site:

- maximising wind yield and maintaining adequate spacing between turbines;

- avoiding designated and protected sites;
- positioning turbines to minimise impacts on ornithology;
- utilising existing tracks, where possible, in order to reduce the footprint of the Proposed Development;
- maximising the distance as far as possible from potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- avoiding positioning turbines in WLA as far as possible;
- avoiding inconsistent turbine spacing, such as relatively large gaps, outliers or excessive overlapping turbines to minimise visual confusion and ensure a balance / compact array from key views within the National Scenic Area (NSA), WLA and the wider area;
- positioning turbines outwith agreed telecommunication link buffers;
- maintaining a suitable separation distance from residential properties to minimise noise, flicker and visual amenity impacts;
- minimising impacts on cultural heritage assets;
- minimising the impacts from traffic and transport;
- maintaining a 50 m buffer from watercourses and keep watercourse crossings to a minimum (one water crossing only);
- avoiding areas of high flood risk; and
- avoiding areas of deepest peat and areas of elevated peat slide risk where possible.

5.4 Proposed Development Layout Iterations

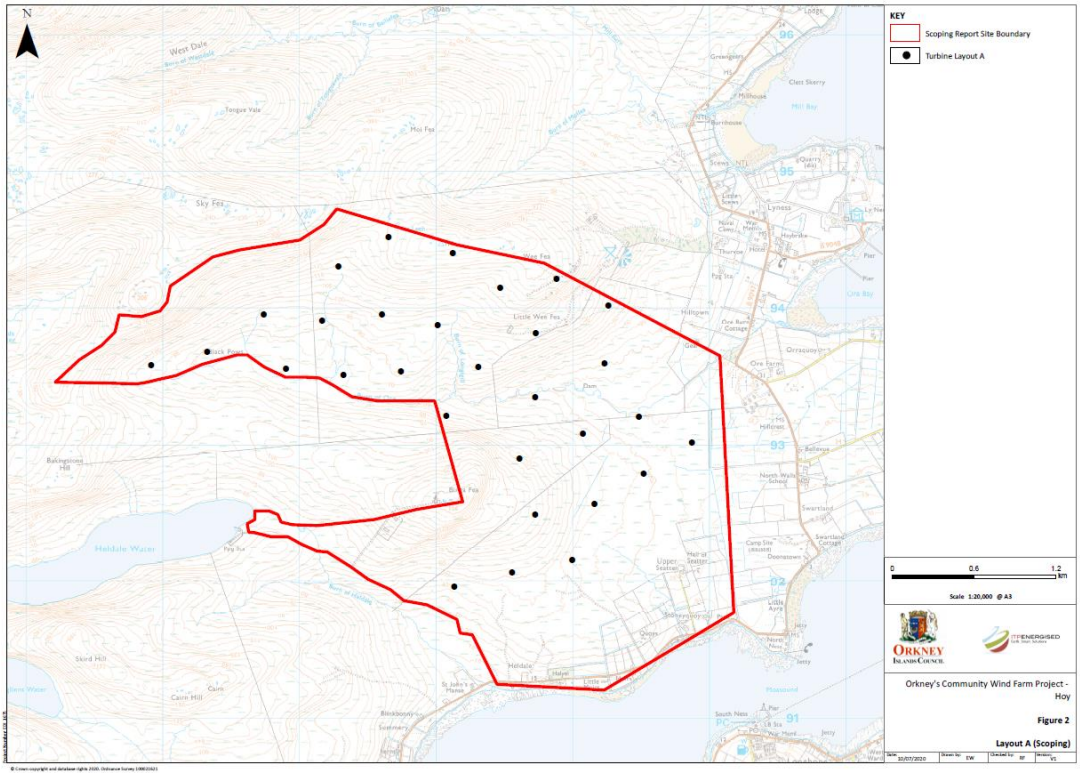
5.4.1 Following the design principles above the Applicant has undertaken multiple design iterations of all aspects of the Proposed Development including the turbine and the infrastructure layout. This Section describes the principal design iterations that have been undertaken as the Applicant has sought to achieve a viable design that maximises the renewable electricity generation from the site, whilst minimising the environmental effects related to the constraints identified above.

Turbine Layout Iterations

Layout A (EIA Scoping)

5.4.2 The initial site layout which was submitted with the EIA Scoping Report consisted of up to 30 wind turbines of approximately 125 m to blade tip (Figure 2). This layout was based on preliminary high-level assessments.

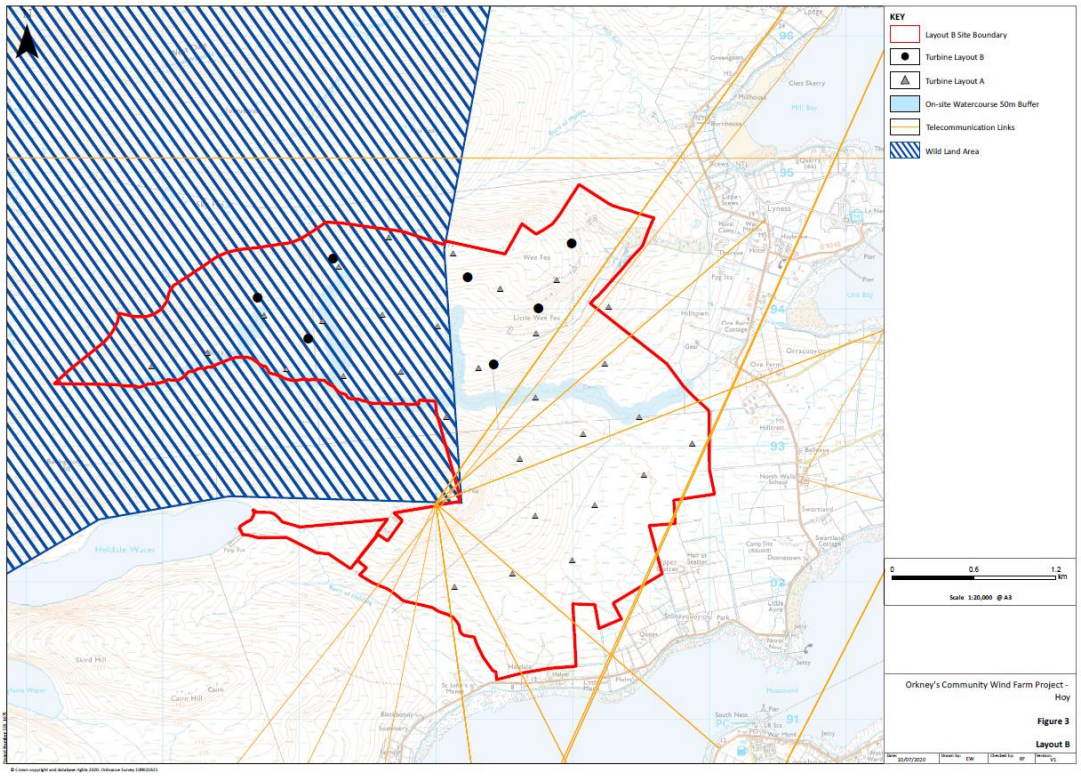
Figure 2: Layout A (EIA Scoping)



Layout B

5.4.3 Feedback during the first season of ornithological surveys indicated that the southern half of the site (as defined at that time (Figure 2)) was less suitable than the north and that it would be necessary to reduce the number of turbines being proposed in order to avoid potentially unacceptable effects on ornithological receptors. Consequently, the site boundary was extended to the north, and the number of turbines was reduced from 30 to seven (Figure 3). At the same time, it was identified that the scale of turbines (tip height and rotor diameter) for the majority of wind energy projects being proposed and progressed in the UK was increasing. Turbine models limited to 125 m tip height were becoming rarer, as larger turbines were being proposed to optimise generation and ensure financial viability of developments following changes to government support mechanisms for onshore wind. The Applicant recognised that, by the time the Proposed Development would be ready for construction, it may be difficult to obtain 125 m turbines and the availability of turbine models could be highly restrictive. In addition, with the changes to government support mechanisms and the additional costs associated with developing in a remote location, it was essential to maximise the generation capacity. Consideration was therefore given to an increased tip height, of up to 149.9 m, remaining below the threshold requiring aviation lighting, but providing greater flexibility in turbine choice, and greater renewable energy generation potential.

Figure 3: Layout B



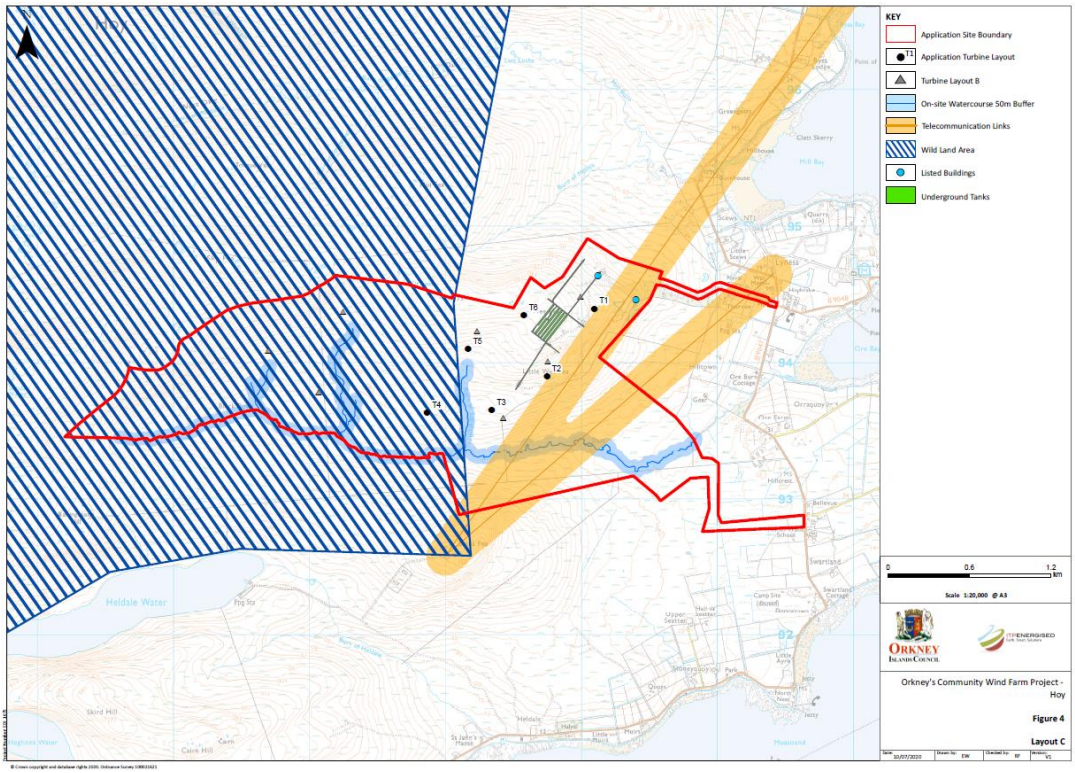
5.4.4 Whilst the primary driver from Layout A to Layout B was ornithology, the change brought the following additional benefits:

- Consultation on Layout A had identified eight turbines that had been in close proximity to telecommunication links. All eight of these turbines were removed for Layout B;
- Five turbines in Layout A were within 50 m of watercourses. All five of these turbines were removed for Layout B;
- Two turbines in Layout A were located within basic flushes (sensitive habitat identified during field surveys). All of the Layout B turbines were outwith the basic flushes; and
- The number of turbines located within the WLA was reduced from 12 to three.

Layout C (Application)

5.4.5 A number of alternative seven turbine layouts were considered that represented improvements to Layout B. However, ultimately it was decided based on the analysis of the extensive bird survey data, that a further reduction in turbine numbers would help to further reduce impacts on ornithological receptors. Therefore, the layout was optimised based on six 149.9 m turbines (Figure 4).

Figure 4: Layout C (Application)



5.4.6 The turbines were positioned to ensure suitable separation distances are maintained from protected nests and to minimise collision risks. Details relating to protected species are provided in Confidential Appendix 7.2.

5.4.7 The application layout was designed to ensure that it appears as a compact and well-contained feature in surrounding views, with care taken to avoid any turbines appearing as outliers. The number of turbines within the WLA was reduced as far as possible, within the confines of other constraints (from 12 in Layout A, down to one in Layout C).

5.4.8 Care was taken to ensure the application layout respected the agreed telecommunication buffers.

5.4.9 The turbines were positioned with due consideration of the two A Listed Buildings and the various non-designated world war assets on-site.

5.4.10 The locations where deepest peat was recorded were avoided wherever possible, within the confines of other constraints noted above. It was not however, possible to entirely avoid areas of deep peat (>1 m depth) given its distribution across the site and the presence of numerous other constraints. However, siting of turbines on deep peat has been avoided or minimised as far as practically possible, and peat slide risk has been minimised.

On-site Infrastructure Layout Iterations

5.4.11 Following confirmation of the turbine locations the design of the accompanying infrastructure was considered. This included access tracks, hardstandings, substation compound and building, temporary construction compound, met mast and the borrow pit search area.

5.4.12 The design was carried out to balance cut and fill where practical. This minimises the requirement for both imported material and on-site borrow.

5.4.13 Numerous adjustments were considered, and various iterations of hardstanding orientations were assessed before the infrastructure layout was finalised. This iterative design process allowed the effects of different wind farm layouts to be assessed then modified to prevent, reduce or offset effects.

5.4.14 Principal adjustments included, inter alia:

- Adjustments around T1 and T2 to maintain suitable separation from the A-Listed underground tanks and taking into account factors such as contours, cut and fill balance, peat depth and peat slide risk;
- Minor adjustments to the placement and orientation of the infrastructure around T4 to minimise the interaction with the 50 m watercourse buffer and to avoid the deepest peat;
- The substation building and compound were relocated from their earlier location (in close proximity to the OS viewpoint), to its final and less prominent location to the north of T1;
- The orientation of the temporary construction compound was adjusted to avoid directly impacting on a visible component of non-designated WWII heritage remains; and
- The borrow pit search area was moved further west from its initially proposed position, to ensure it would not impact on key views from the A-Listed Naval Headquarters and Communication Centre.

6 Public/Community Involvement

6.1.1 The Applicant has engaged with local communities throughout the development of the Proposed Development. This engagement has been undertaken through a variety of approaches:

- Launch Event in April 2018
- Follow-up public exhibition in January 2019
- Virtual public information day
- Availability of project team members for one-to-one Skype presentations
- Availability of project team members by telephone for question and answer sessions
- Availability of project team members by email to answer queries
- Website with information on the Proposed Development, including a video presentation of the exhibition material

6.1.2 The Applicant submitted a Proposal of Application Notice (PAN) in February 2020. In line with good practice for the consenting stage of major development projects as set out within the Planning Circular 3/2013 'Development Management Procedures', a programme of pre-application community engagement has been undertaken by the Applicant.

6.1.3 This consultation allowed local residents to provide their opinions on the principle and design of the Proposed Development, while also raising concerns. Full details are provided in the Pre-Application Consultation Report.

7 Programme

7.1 Construction

7.1.1 The estimated on-site construction period for the Proposed Development is expected to take approximately 18 months and includes a programme to reinstate all temporary working areas.

7.1.2 Normal construction hours will be between 07:30 to 18:00 weekdays and 08:00 to 13:00 Saturdays. There will be no working on Sundays or bank holidays. If required, additional working hours will be agreed in consultation with OIC's Environmental Health Officer. These times have been chosen to minimise disturbance to local residents and if required to be restricted this will be agreed with OIC by an appropriately worded condition. Details of the construction programme will be provided to

OIC in a Construction Environmental Management Plan (CEMP) prior to the commencement of construction.

7.1.3 Table 1 below shows the indicative construction programme.

Table 1 – Indicative Construction Programme

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site establishment																		
Access tracks, turbine hardstanding construction and peat extraction																		
Turbine foundations construction																		
Cable laying																		
Turbine erection																		
Substation construction																		
Site reinstatement & commissioning																		

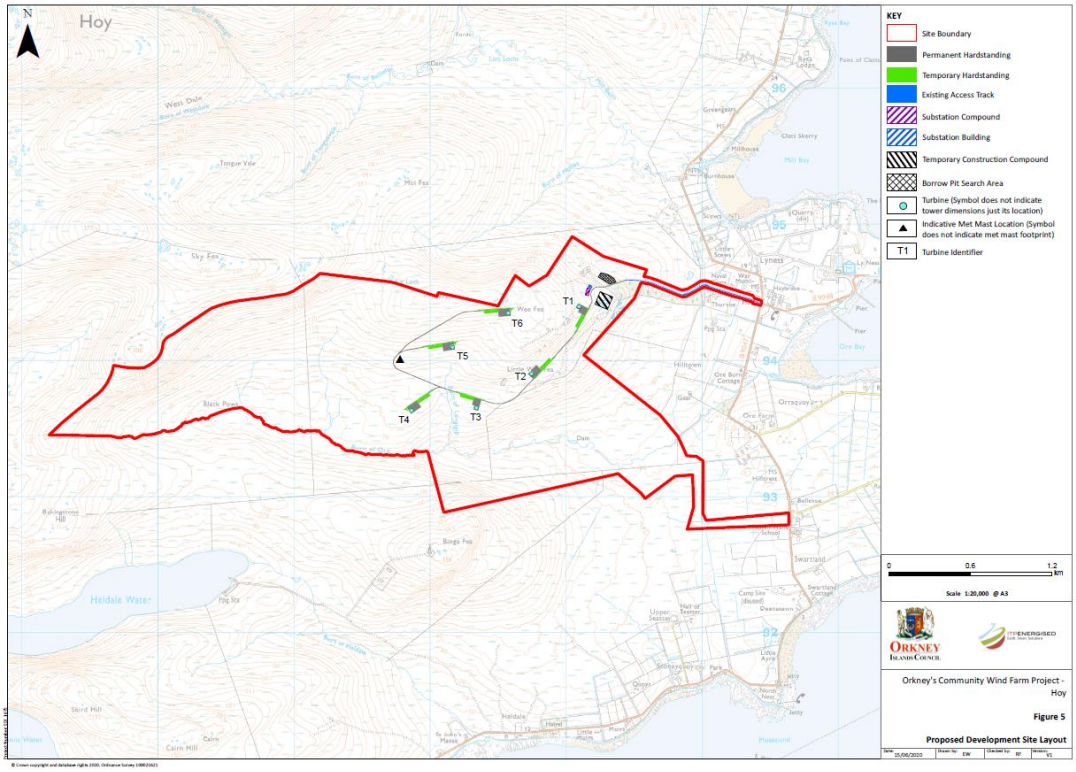
7.2 Operation

7.2.1 The Applicant is applying for consent in perpetuity.

8 Design Solution

8.1.1 The Proposed Development comprises of six wind turbines of up to a maximum 149.9 m height from ground to blade tip when vertical. The indicative capacity of the Proposed Development will be c.28.8 MW. The actual installed capacity may be greater or less dependent on turbine model selection but will not be greater than 50 MW. A number of ancillary elements are also proposed, including access tracks, a watercourse crossing, crane hardstandings, underground cabling, possible external transformers, on-site substation and maintenance building, a temporary construction compound, borrow pit and a permanent meteorological mast (refer to Figure 5). Further details of the site infrastructure are provided within Chapter 3 (Proposed Development) of the EIA Report.

Figure 5: Site Layout



9 Conclusion

9.1.1 The initial site layout consisted of up to 30 wind turbines of approximately 125 m to blade tip (Figure 2). This layout was based on preliminary high-level assessments.

9.1.2 The final layout has been informed by a robust environmental assessment and design iteration process, taking into account physical constraints, potential environmental, landscape and visual impacts and their effects. The information used to inform the design iteration process included consultation responses received, baseline data and the impact assessment undertaken.

9.1.3 The final layout comprises six turbines of up to 149.9 m tip height, and their associated infrastructure, as shown in Figure 5.

9.1.4 The Proposed Development layout is considered to represent the most appropriate design, taking into account potential environmental impacts and physical constraints, while maximising the renewable energy generating capability of the site.

9.1.5 Overall, the Proposed Development is an appropriately designed, sensibly located, and completely sustainable development which is in line with policies in the local and strategic development plans and conforms to national policy. It will provide valuable contribution towards economic growth on Orkney and in Scotland as a whole.