Non-Technical Summary

Burgar Hill Wind Farm Repower

Client: Burgar Hill Energy Limited
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1 Introduction

1.1 Overview

This Non-Technical Summary (NTS) has been prepared by Green Cat Renewables (GCR) on behalf of the Applicant, Burgar Hill Energy Ltd., to accompany the Planning Application submitted to Orkney Islands Council (OIC) for the repowering of five existing wind turbines at Burgar Hill Wind Farm (the 'Proposed Development'). This NTS summarises the **Environmental Impact Assessment Report** (**EIAR**) for the Proposed Development.

As shown in **Image 1.1** the Proposed Development is to be located within the OIC area, approximately 1.4km north-west of the village Evie and 1.0km south-west of the A966.

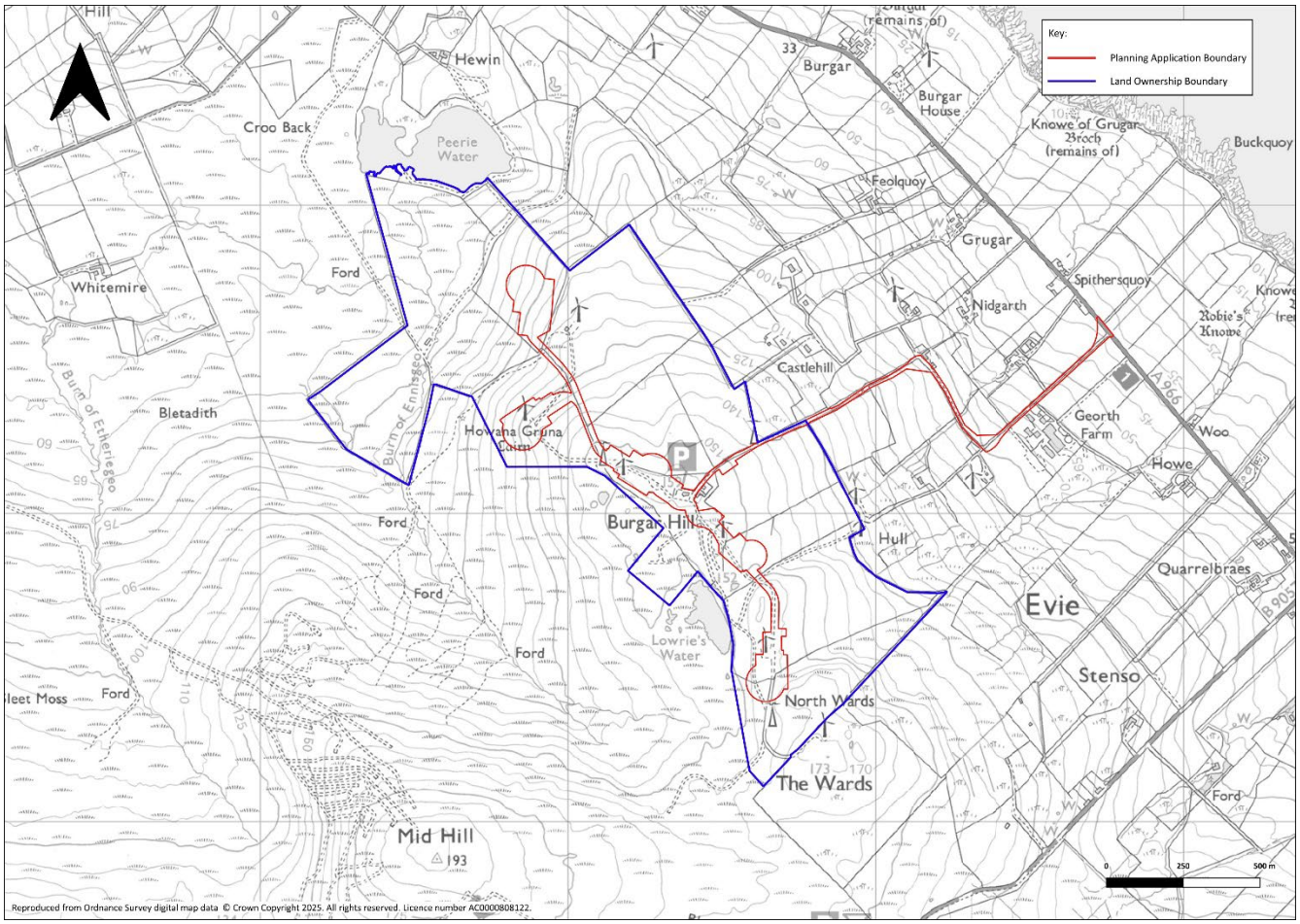

Image 1.1 – Site Location Plan

1.2 The Applicant

Burgar Hill Energy Limited is a joint venture between the local Spence family who own Burgar Hill Renewables Limited and Thrive Renewables plc, created to repower the wind farm on Burgar Hill once the current infrastructure comes to the end of its operational life. Both parties each currently operate an existing turbine on the Site and as of December 2025, Burgar Hill Energy has taken ownership of two Nordex N80 turbines which operate as part of the Existing Scheme.

1.2.1 Burgar Hill Renewables (BHR)

Burgar Hill Renewables Limited owns most of the land on Burgar Hill and is the operator of a 2.3MW Enercon E-70 on Burgar Hill, commissioned in 2009. Burgar Hill Renewables Limited is owned by Orcadians Mervyn and Maureen Spence and their children.

1.2.2 Thrive Renewables plc

Thrive Renewables plc exists to tackle the climate emergency, working with investors, developers, businesses and communities to fund, build and operate clean energy projects since 1994. The company has operated a 1.3MW Nordex N60 turbine at Burgar Hill for over twenty years. Originally established to widen ownership of clean energy projects, the Bristol-based company unites a community of over 6,500 shareholders, mostly individual small investors.

1.3 The Agent

Green Cat Renewables Ltd (GCR) have been commissioned to prepare the EIA and supporting documents and manage all aspects of the planning submission. GCR is an environmental and engineering consultancy based in Scotland, with an expanding team spread across 4 offices. The company's multi-disciplinary resource base covers all stages of project delivery from feasibility through to planning, engineering, project management and operational asset management.

2 Environmental Impact Assessment

Due to the potential for the Proposed Development to result in significant environmental effects, an Environmental Impact Assessment (EIA) has been carried out in accordance with the Town and Country Planning Act (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

EIA is a statutory process governed by UK law that assesses the likely significant environmental effects arising from a proposed development, and in this case evaluates the potential effects associated with the construction, operation and eventual decommissioning of the proposed repowering. The aim is to ensure that potential impacts on matters such as (but not limited to) human health, biodiversity, natural resources, landscape and cultural heritage are fully understood and appropriately managed. The EIA process has been informed by detailed consultation with public bodies, local authorities, and other important stakeholders.

The EIAR describes the existing environmental conditions to identify sensitive assets or features (known as receptors) and the methods used to assess whether environmental effects, either beneficial or adverse, are predicted due to the construction, operation or decommissioning of the Proposed Development. Where appropriate, it also sets out mitigation measures designed to prevent, reduce and if possible, offset any significant adverse environmental effects. Following consideration of mitigation measures, any remaining residual effects are also presented.

The EIAR also assesses 'cumulative effects' which considers how multiple effects occurring simultaneously may affect a receptor. This could be due to effects of the Proposed Development happening in combination with those from other existing, approved, and/or developments in planning (i.e. in the process of being determined by the planning authority).

Individual methodologies for assessing each EIA topic are described in detail within each of the technical topic chapters in the EIAR.

3 Assessment of Alternatives

3.1 Introduction

The EIA process requires developers to consider reasonable alternatives when selecting a site and designing a project. This ensures that potential adverse impacts which may result from the Proposed Development have been avoided or minimised as far as reasonably practicable. This chapter explains how Burgar Hill Wind Farm was identified as a suitable site for repowering and how the Site was designed and evolved to minimise environmental effects while maximising energy generation.

3.2 Policy Context

Scotland has legally binding targets to reach net zero greenhouse gas emissions by 2050, supported by national planning policy and the Onshore Wind Policy Statement. These policies encourage the development and repowering of wind farms to increase renewable energy generation. Repowering existing wind farm sites is particularly supported as it can increase energy output while using established infrastructure and locations already associated with wind energy development.

3.3 Site Selection

Burgar Hill was identified as a suitable site for repowering due to its long-standing association with wind energy, having been developed as a test site in the 1980s and later as a commercial wind farm. The turbines comprising the Burgar Hill Wind Farm (the Existing Scheme) have been operating between 17 and 26 years, during which extensive data has been collected, confirming the Site's high wind resource. Repowering the Existing Scheme provides an opportunity to continue generating renewable energy, maintaining Burgar Hill's historic role in wind energy generation, while improving efficiency and contributing to national and local renewable energy targets.

3.4 Design Principles

Relevant guidance on wind farm siting and layout was considered throughout the design process to ensure environmental impacts could be minimised as much as possible. Key design principles included:

- Minimising impacts on the landscape and visual environment;
- Protecting heritage features and archaeological sites;
- Avoiding environmental designations and sensitive habitats;
- Avoiding areas of deep peat;
- Avoiding watercourses;
- Maintaining appropriate distances from residential properties; and
- Making use of existing access tracks and infrastructure where possible.

3.5 Site Constraints

Primary constraints identified on-site included:

- Proximity to residences (considered in relation to noise, shadow flicker and visual impacts);
- Areas of potential archaeological interest;
- Proximity to services and associated infrastructure (e.g., telecommunications masts and overhead lines);

- Operational Burgar Hill T6 which is assumed to remain in-situ;
- Watercourses and waterbodies on-site; and
- Proximity to ecological designations (Sites of Special Scientific Interest (SSSI) and Special Protection Areas (SPA)).

Additional constraints considered in the wider area include:

- Landscape character and designations;
- Cultural heritage assets and designations, including the Heart of Neolithic Orkney World Heritage Site (WHS);
- Other wind farm developments.

3.6 Design Evolution and Iterations

The final layout was developed through three main design stages as outlined in Table 3.1.

Table 3.1 – Design Iterations

Iteration	Description
1 – Feasibility and Scoping Layout	Initial feasibility work confirmed that repowering the Site was possible. Studies conducted in the early stages of the project suggested the Site could potentially support up to four turbines with a height of around 200m to blade tip.
2 – Post-Scoping Layout	Following consultation with stakeholders and further environmental surveys, the turbine layout was refined to avoid sensitive habitats, improve construction feasibility and respond to site constraints. Small adjustments were made to turbine locations.
3 – Planning Layout	Further assessment of noise, landscape, heritage impacts led to additional changes. Turbine height was reduced from 200m to 149.9m to reduce potential visual, noise and heritage impacts. To maintain energy generation capacity, the layout was updated to include five turbines instead of four, which more closely aligns to the Existing Scheme layout. Reducing turbine height also removed the need for aviation lighting, avoiding potential nighttime visual impacts and ensuring no conflict with nearby airport flight procedures. Infrastructure such as tracks, compounds and turbine locations were then refined to avoid environmental sensitivities, reduce impacts on agricultural land and maximise the use of existing infrastructure.

3.7 Conclusion

The final layout was developed through an iterative design process informed by environmental surveys, technical assessments, consultation with stakeholders and engagement with the local community. The design aims to minimise environmental effects while maintaining the Site's contribution to renewable energy generation.

Repowering Burgar Hill will allow the Site to continue its long-standing role in wind energy generation while helping to meet local and national climate and renewable energy targets.

4 Proposed Development

4.1 Development Description

The Proposed Development will see the replacement of five of the existing turbines with five larger turbines with a tip height of up to 149.9m to tip. As demonstrated on **Image 4.1,** the final design of the Proposed Development will comprise:

- Five, three-bladed wind turbines measuring up to 149.9m to tip;
- Crane hardstandings and laydown areas at each turbine location;
- Turbine foundations;
- New and upgraded access tracks, including two turning areas;
- Temporary/permanent construction compounds, including parking, and welfare facilities;
- Onsite cabling and a new substation building; and
- Associated ancillary works.

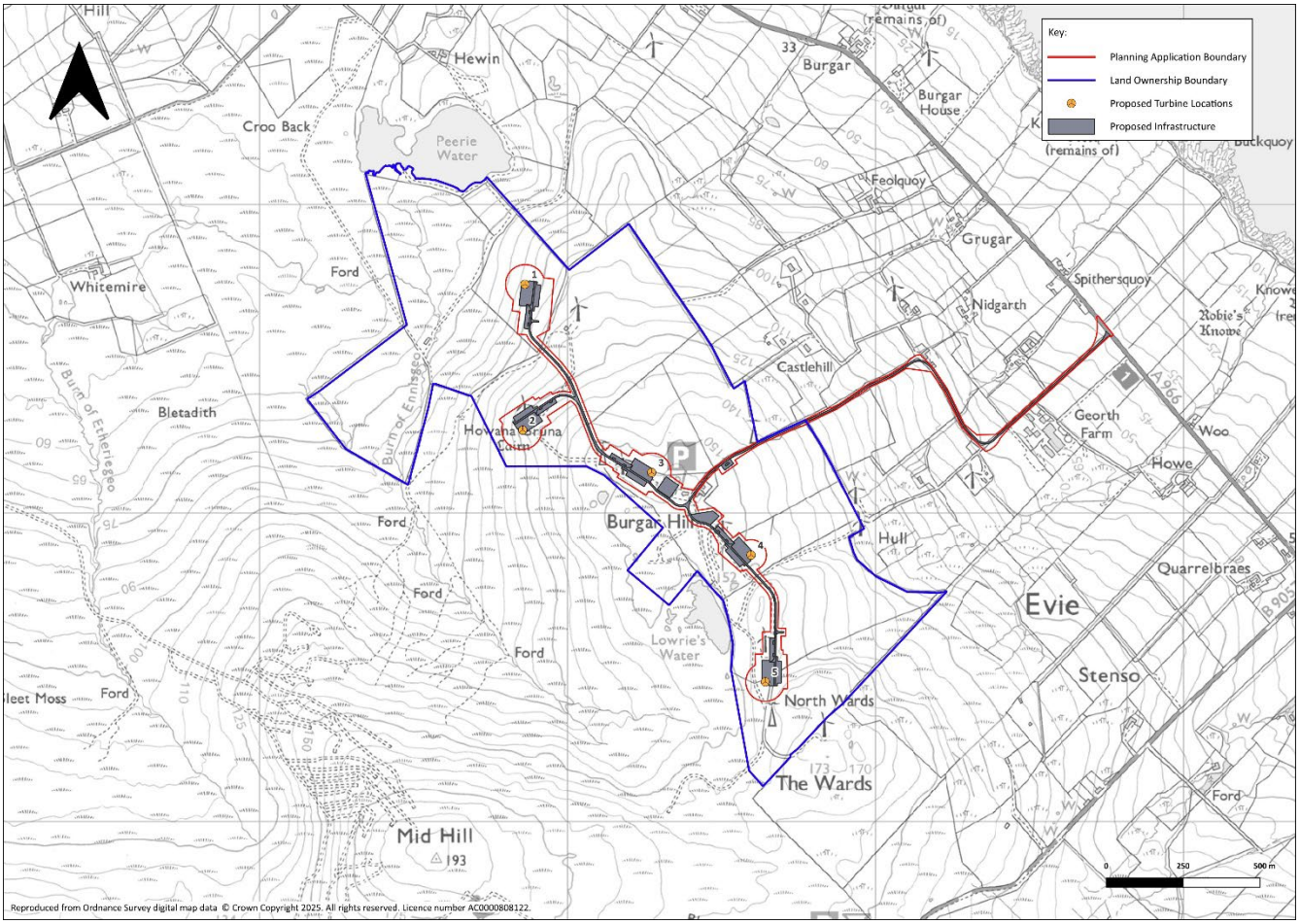

Image 4.1 – Site Layout Plan

4.2 The Site

The Site falls within Landscape Character Type (LCT) 314, titled 'Moorland Hills - Orkney'. This LCT is characterised by gently rolling hills covered mainly by heather, rough grassland and peat. Parts of the Site comprise areas of peat and bog which have been carefully considered during the design process to minimise disturbance. The Site is generally not at risk of flooding, aside from small, localised areas near minor watercourses.

The southern and western boundaries of the Site lie immediately adjacent to Orkney Mainland Moors, an area designated for its importance to breeding birds such as hen harriers, short-eared owls and red-throated divers. This area has also been recognised as a SSSI and SPA and has been taken into consideration during the design of the Proposed Development.

The Site is influenced by existing wind energy developments in the surrounding area. This includes Burgar Hill T6, located just outwith the southern boundary of the Site and which is assumed to remain in place. Other nearby wind energy developments considered include (but are not limited to) Ludenhill Wind Turbine, Hammars Hill Wind Farm and Nisthill Wind Farm which is currently in planning.

4.3 Access

Wind turbine components are proposed to be delivered to Hatston Pier in Kirkwall. As depicted in **Image 4.2**, there are two different routes to the Site that have been identified as viable and which are currently being explored.

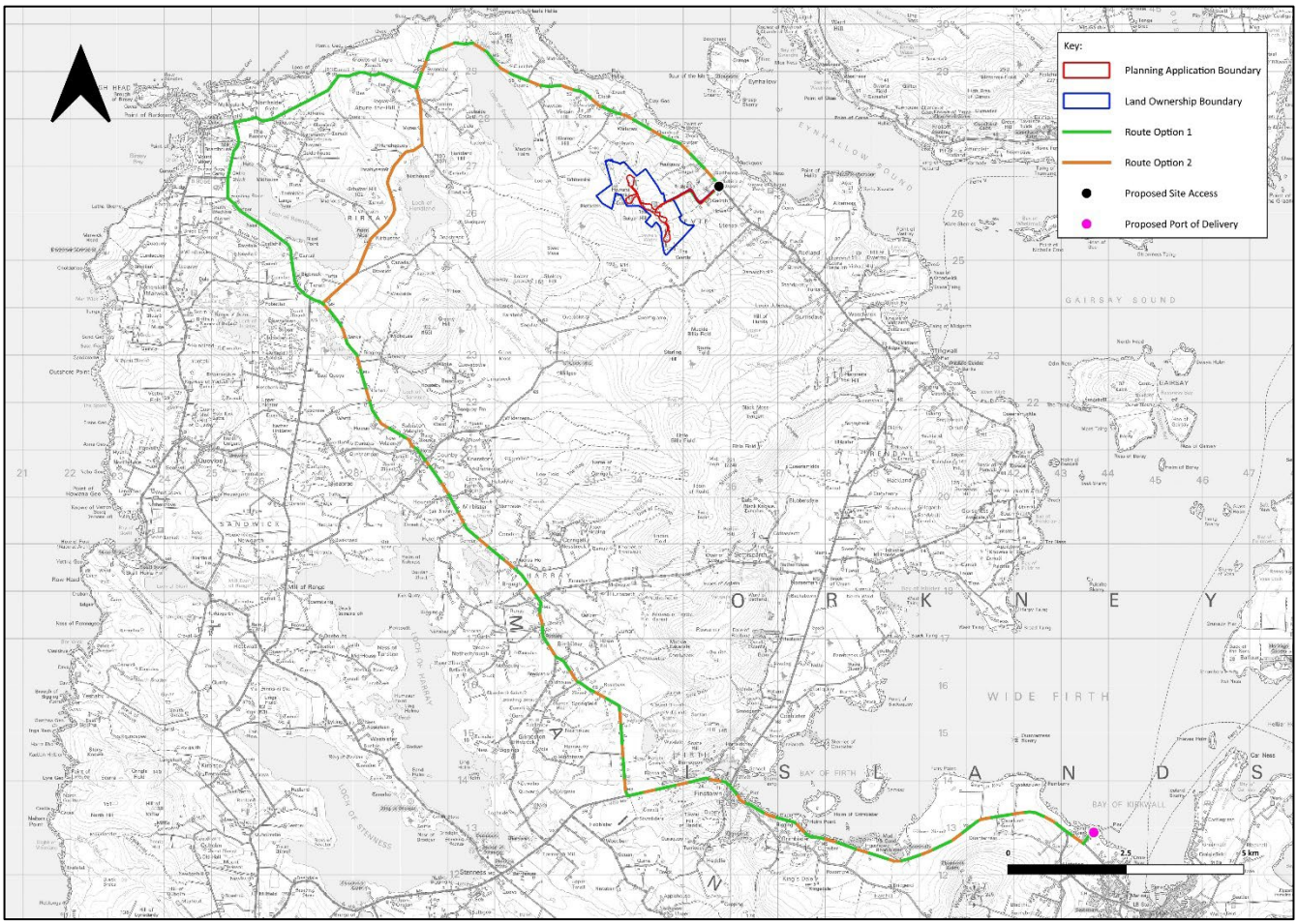

Image 4.2 – Access Route Options

Option 1: Components will be transported from Hatston Pier along the A965, through Finstown before turning northwards on the A986. It is intended that the vehicles will follow the A966 through Dounby to Birsay, then following the coastal road through Costa then to Burgar Hill, exiting the A966 at Georth Road and continuing to the Site.

Option 2: Option two will follow the same route as Option one until Twatt where vehicles would exit onto Hundland Road. Vehicles would continue north-east along Hundland Road until re-joining the A966 and following the coastal road through Costa then to Burgar Hill, exiting the A966 at Georth Road and continuing to the Site.

These routes were established to allow delivery of larger turbine parts to the Site and avoid tight pinch points within Finstown. A detailed assessment of these route options is provided in **EIAR Chapter 11 – Traffic and Transport**, which highlights areas of potential constraints along the delivery route.

4.4 Construction

The construction phase is expected to last around 12 to 18 months, depending on planning approval, construction contracts, the time of year and weather conditions. Largely due to grid connection availability, construction is not expected to start before 2029.

Prior to the commencement of construction, necessary site investigations and surveys will be carried out to help finalise design and inform the Construction and Environmental Management Plan (CEMP). The CEMP is intended to set out how environmental impacts will be managed during construction via measures outlined in **EIAR Chapter 15 – Summary of Mitigation** and will be agreed with the planning authority and relevant consultees.

An Ecological Clerk of Works (ECoW) will also be present on-site during construction to oversee environmental protection measures. Additional environmental specialists will be brought in if needed. All mitigation measures are described in detail in the relevant technical chapters.

4.5 Operation

The development would operate for 40 years. Once construction is finished, all large machinery required for construction such as cranes would be removed and the Site restored where necessary to improve its appearance.

4.6 Maintenance

During operation, the Site would be visited periodically by technicians to carry out maintenance and safety checks. Most visits would be short and infrequent, although planned maintenance may require technicians to be on Site for several weeks each year. Occasional unscheduled maintenance would also be required.

Maintenance activities would be limited and controlled and environmental protection measures would continue to be followed throughout the operational life of the development.

5 Landscape and Visual

EIAR Chapter 5 – Landscape and Visual assesses how the Proposed Development may affect the landscape character and visual appearance of the area, as well as views experienced by people living, travelling and visiting nearby.

5.1 Baseline

The Site is located within a landscape characterised by gently undulating moorland with a relatively simple landform. Views are often long-distance due to the landscape's slightly elevated position and proximity to the coast, extending across the surrounding countryside and towards nearby islands such as Rousay, Eynhallow and Wyre.

The area is largely rural, comprising a mix of rough grazing, heathland and peatland habitats with few trees, likely owing to strong winds. There are also a number of designated landscapes and cultural heritage assets within the surrounding landscape, including the Heart of Neolithic Orkney World Heritage Site and Hoy National Scenic Area. These areas are valued for their scenic quality and historic significance, thereby forming an important part of the wider landscape setting.

Importantly, the Site is not undeveloped as it already contains the Existing Scheme and associated infrastructure. As such, the existing landscape has an established association with wind energy, with a number of wind farms present in the wider area further contributing to a landscape influenced by renewable energy infrastructure of which three of the Existing Scheme turbines have perpetual consent and as such, the presence of wind energy on Burgar Hill would always be present in some form.

It is important to recognise that the baseline reflects the landscape as it currently exists, rather than how it may have appeared in the past as an undeveloped site. The magnitude of landscape and visual impacts is therefore assessed based on the change resulting from the replacement of the existing turbines with new turbines. Adopting a 'no turbine' scenario as the baseline would be inaccurate, as it would fail to reflect current on-site conditions and how the landscape is currently experienced by receptors.

5.2 Predicted Effects

5.2.1 Construction

Landscape
During the construction phase, effects on landscape and views would be temporary. These would include the presence of construction equipment, cranes, vehicles, and the creation of new or upgraded tracks and infrastructure.

Visual
Construction activities may be noticeable, particularly from nearby properties and roads, but would be short-term and limited to the duration of construction phase.

5.2.2 Operation

Landscape
During the operational phase, the main effects would arise from the presence of the turbines themselves. Given that the Existing Scheme is currently a key feature of the surrounding landscape, the Proposed Development would have a limited degree of contrast to this baseline. The use of existing infrastructure where possible and the similar design pattern further helps to ensure there is no drastic change to the existing landscape. Effects on landscape character are expected to be localised. While the turbines would alter the appearance of the Site, the

area already contains wind turbines and is therefore not considered a pristine or undeveloped landscape. The Proposed Development would be seen as a replacement within an established wind farm landscape setting.

Visual

The proposed larger turbines would have a greater visual impact on receptors as they are taller structures with longer blades. These would be noticeable from parts of the surrounding area, particularly where views are open and elevated. The degree of visibility would vary depending on factors such as distance, topography and direction of view. In closer views, turbines may appear prominent and form a noticeable feature in the landscape. At greater distances, they would appear smaller and less visually dominant. Views from south of the Site are particularly limited by topography.

Effects on visual amenity would vary depending on the viewer. For instance, nearby residents and local road users to the north-west may experience noticeable changes in their views, particularly where turbines are in their direct line of sight, however the overwhelming majority of dwellings are orientated in the opposite direction from the Proposed Development. Recreational users and visitors may also experience changes in views from certain locations, particularly the small section of a the A966 and St Magnus Way which runs between Evie and Costa. However, in many views, existing turbines and other developments already influence the landscape, meaning the overall change is reduced.

5.2.3 Cumulative

Landscape

The assessment also considers cumulative effects, where the Proposed Development would be seen alongside other wind farms in the area.

While the Proposed Development would introduce visible changes to the landscape and views, these are largely contained within an area already influenced by wind farm development, and effects are expected to decrease with increasing distance from the Site.

Visual

In some locations, multiple wind farms may be visible within the same view, increasing the perception of development. However, given the pattern of wind energy in the area, the additional effect of the Proposed Development is generally considered to be incremental rather than transformative. Such effects would also depend on projects such as Costa Head and Nisthill being constructed.

5.3 Mitigation

Measures taken to reduce landscape and visual effects have been incorporated throughout the development and design process. These are referred to as embedded mitigation, meaning they are incorporated into the project from the outset to avoid significant impacts rather than introduced later to reduce them. As such, key mitigation measures include:

- Optimising turbine layout: turbines have been arranged to form a clear and coherent pattern similar to that of the existing development, which helps reduce visual impact and ensures the wind farm appears as a single, organised development.
- Turbine height and scale: the final turbine height has been reduced from 200m as initially proposed to 149.9m to lessen visibility and reduce potential effects on nearby views, landscape character and heritage settings. Reduction in height also eliminated the need for aviation lighting, which is required on structures over 150m tall.
- Maintaining an appropriate number of turbines: the number and positioning of turbines have been selected to ensure there is a balance between maximising energy generation while avoiding unnecessary visual effects, it also keeps the overall number of turbines the same as the existing development, replacing 5 with 5.

- Use of an established site: the development is located within an existing wind farm, meaning it benefits from a landscape that is already associated with wind energy, thereby reducing the degree of change compared to developing on a new site, as well as alleviating pressure on undeveloped areas in Orkney.
- Avoiding sensitive receptors: turbines have been positioned to maintain appropriate distances from nearby residential properties, key viewpoints and designated landscapes, helping to reduce potential effects on visual amenity.
- Minimising additional infrastructure: existing tracks and infrastructure are used where possible to limit the need for new features and reducing landscape disturbance.
- Careful infrastructure design: tracks, hardstandings and ancillary infrastructure have been designed to follow the natural landform where possible, thereby reducing earthworks and visual intrusion.
- Avoidance of sensitive landscape features: the layout has been refined to avoid areas of higher landscape or cultural sensitivity where practicable.

Through this iterative design process, landscape and visual effects have been reduced as far as reasonably practicable. As a result, no additional mitigation beyond good design practice is required and the remaining effects are considered acceptable in the context of the landscape and visual related planning policy.

6 Cultural Heritage and Archaeology

EIAR Chapter 6 – Cultural Heritage and Archaeology considers whether the Proposed Development has the potential to impact archaeological features and heritage assets through the construction, operation or decommissioning phases of the Proposed Development. The assessed impacts could affect either the physical asset or its setting.

The assessment has been undertaken by AOC Archaeology Group, a Registered Organisation of the Chartered Institute for Archaeologists. The scope and method of the assessment have been subject to consultation with the Orkney Islands Council Archaeology Officer and substantial consultation with Historic Environment Scotland. In addition, this assessment has been peer reviewed by experienced professionals at the Orkney Research Centre for Archaeology (ORCA).

6.1 Predicted Effects and Mitigation

6.1.1 Construction

It is possible that undiscovered archaeological remains could be present on the Site of the Proposed Development. In addition, a number of known assets have been recorded in close proximity to and within the footprint of the proposed infrastructure. Potential physical effects on 13 non-designated heritage assets (Assets 161, 163 and 164 representing the original Burgar Hill Wind Farm, 192 representing a turf dyke, and 197-205 representing former tracks or access routes) have been identified. However, none of these potential effects are considered significant in EIA terms, meaning that any effects would be at most minor and would not harm the overall heritage value of the assets.

Given the proximity of the proposed access track to known assets and the potential for unrecorded buried archaeological remains to survive, mitigation measures, designed to avoid, minimise or offset impacts, have been proposed. These include site design to avoid asset locations where possible, demarcation of known assets to avoid inadvertent damage during the construction period and maintenance of a targeted archaeological watching brief during ground breaking works in areas of known heritage assets or archaeological potential. The mitigation proposed will allow for avoidance of impacts or, where this is not possible, will allow for any remains that cannot be preserved in in situ to be investigated and recorded and thus impacts would be offset through preservation by record.

6.1.2 Operational

During the operational phase, potential significant effects on the setting of the Scheduled Stones of Stenness (Asset 6) and the Ring of Brodgar (Asset 5) have been identified. Effects upon the setting of these assets has been minimised insofar as possible through the design process, notably by reducing the tip height of the turbines from 200m as initially proposed, down to 149.9m which significantly reduces visibility from these assets.

The assessment also considered cumulative effects, where the Proposed Development is seen alongside other wind farm developments. Potential significant cumulative effects have been identified upon the setting of the Heart of Neolithic Orkney (HONO) World Heritage Site (WHS) (Asset 1), the Scheduled Ring of Brodgar (Asset 5) and the Scheduled Stenness stone circle and henge (Asset 6).

While these effects are considered significant in EIA terms, the assessment concludes that the ability of the settings of the Scheduled Monuments to contribute to an understanding, appreciation and experience of them would be adequately retained and thus there would be no significant adverse impact upon the integrity of the assets' settings. As such the Proposed Development would not be contrary to Policy 7(h) of NPF4.

The Outstanding Universal Value (OUV) of the HONO WHS is defined in the draft management plan created by Historic Environment Scotland (2025) as comprising the following key attributes:

- Attribute 1: The extensive physical remains of the four major monuments and their associated funerary and ceremonial sites.
- Attribute 2: The intricate interplay between the monuments and between the monuments and the wider archaeological landscape forms a rich visual and archaeological narrative.
- Attribute 3: The relationship of the monuments with the surrounding landscape and environment.
- Attribute 4: The architectural sophistication and exceptional preservation of the monuments.
- Attribute 5: The role of the WHS monuments in the development of archaeology as a discipline.

The assessment concludes that the Proposed Development would not undermine the above attributes for which the HONO WHS is recognised, and there are no significant effects on the OUV of the HONO WHS or its setting resulting from the Proposed Development on its own. Whilst the turbines would be located in the Inner Sensitive Zone and would break the skyline at one of the sensitive ridgelines, this would be a slight incremental change from the existing baseline, where the Existing Scheme is currently seen beyond the ridgeline. As such it is not considered that the Proposed Development would result in a significant negative impact on the OUV or the setting of the WHS. On the basis of this assessment, it is considered that overall, the attributes would remain intact and the OUV would be protected and preserved in line with NPF 4 Policy 7l. As a result, the Proposed Development would not therefore have a significant effect upon the HONO OUV in terms of Policy 8(b)i of the Orkney LDP (OIC, 2017a: 32).

The assessment also concludes that no adverse impacts are anticipated during the decommissioning phase.

6.1.3 Cumulative

A significant cumulative effect on the setting of the HONO WHS has been predicted when the Proposed Development is considered together with the Proposed Nisthill Wind Farm. The two developments together would extend the horizontal spread of turbines across the skyline in certain views. However, it is reiterated that whilst the Proposed Development would introduce taller turbines, it would be largely contained within the same view as the Existing Scheme and would replace the current infrastructure without increasing the turbine envelope along Burgar Hill. As such it is not considered that the addition of the Proposed Development would result in a significant negative impact on the OUV or the setting of the WHS.

6.2 Summary

Following implementation of mitigation measures, potential direct effects will be avoided or offset. All operational effects upon the settings of designated heritage assets would be as described in Section 6.1.2 above however beneficial effects are predicted with the removal of the turbines following decommissioning, as the Site would not just be returned to the current baseline, which includes the Existing Scheme, but would be returned to a pre-turbine scenario.

7 Noise

EIAR Chapter 7 - Noise assesses the potential noise effects of the Proposed Development on nearby properties and the surrounding area during operation.

Onshore wind turbines generate sound primarily from their blades passing through the air. This sound varies with wind speed and is typically most noticeable at moderate wind conditions. At high wind speeds there is also increased background noise, which masks the turbine noise and makes it less noticeable. Modern turbines, including those to be installed for the Proposed Development, incorporate noise-reduction technologies like trailing edge serrations. Regulatory standards further ensure operational noise remains within safe and acceptable thresholds at nearby dwellings.

7.1 Baseline

As part of the baseline study, background sound levels were measured at three nearby residential properties. These locations were selected due to their proximity to the Proposed Development and to ensure clusters of properties within the study area were considered. The data collected established prevailing noise conditions in both quiet daytime and night-time periods under various wind speeds. This information was used to define allowable operational noise limits in accordance with industry guidance (ETSU-R-97).

7.2 Predicted Effects

7.2.1 Construction

The construction phase includes building the access tracks and installing the turbines. Noise will be controlled following best practicable means and a suitably worded planning condition, therefore a detailed construction noise assessment has been scoped out of the assessment. If construction activities are necessary outwith normal working hours (for example, due to weather delays), noise levels would follow stricter evening limits. Therefore, construction noise is predicted to have a minor effect, and no mitigation beyond normal good practice is required.

7.2.2 Operation

Operational noise limits are designed to protect local residents and are based either on background noise plus 5 decibels (dB) or a fixed limit of 38 or 43 dB(A), depending on the time of day.

Noise modelling results showed that at some windspeeds during daytime periods, the maximum allowed levels, as set by ETSU-R-97, at the nearest receptors were exceeded. The exceedance occurs between windspeeds of 6 – 8m/s, to a maximum of 2.7 dB(A).

The predictions show that the Proposed Development is not expected to exceed the night-time ETSU-R-97 noise limits at any residential property.

7.2.3 Cumulative Effects

Cumulative noise from wind farms within 3km of the Proposed Development have been accounted for, this includes a single turbine of Burgar Hill T6 and four turbines from the proposed Nisthill Wind Farm. The cumulative calculations show that these developments will have negligible impact on overall noise levels at the assessed receptors.

7.3 Mitigation

Noise mitigation in the form of sound optimised operation modes at specific wind speeds is proposed during daytime. This is where the turbine operates in a lower power output, reducing the overall sound levels.

It is expected that appropriate planning conditions would be put in place to ensure the project complies with the respective noise limits and to ensure the protection of residential amenity at all receptors.

8 Ecology

8.1 Baseline

Surveys were carried out to understand the types of habitats and wildlife present on-site and in the area surrounding the Proposed Development. Much of the surveys and fieldwork was undertaken by a local ecologist familiar with the Site and the local ecological context.

There are several designated nature conservation sites located in the wider area of the Proposed Development which are recognised for their ecological importance; however, none of these are located within the Application Boundary and their distance from the Site make direct impacts unlikely.

The Site mainly consists of grassland and heathland habitats typical of the Orkney landscape, with some wetter areas and patches of peat. Most habitats present are common in the surrounding area; however, some peatland and wet habitats are considered more ecologically sensitive.

The surveys also recorded several species of mammals. Otter activity was found in the wider area near waterbodies, although important features such as breeding sites were not located close to the proposed turbines. Orkney vole, a species unique to the islands was recorded within grassland and heath habitats on-site. Brown hare was also observed in nearby fields.

Such information on existing conditions was used to inform the ecological assessment and to ensure that potential impacts on habitats and wildlife are avoided or minimised where possible. Due to the Existing Scheme, historic ecological data on the Site was also available and helped to inform further assessments.

8.2 Predicted Effects

The main ecological impacts that could arise from the Proposed Development include:

- Loss or disturbance of habitats during construction, including sensitive wet and peatland habitats;
- Disturbance to protected species, particularly near watercourses;
- Potential impacts on peatland habitats; and
- Potential disturbance to wildlife during construction and operation.

These impacts are generally expected to be localised and temporary, particularly during the construction phase.

8.3 Mitigation

A range of measures have and will be implemented to minimise ecological impacts, including:

- Careful siting of turbines and infrastructure to avoid sensitive habitats, particularly peatland and wet habitats;
- Protective buffers around watercourses within which construction will not take place;
- Good practice construction methods to prevent pollution or disturbance to wildlife;
- Pre-construction checks for protected species; and
- Environmental management procedures during construction.

These measures will be secured through a Construction Environmental Management Plan (CEMP) and implemented by an Ecological Clerk of Works during construction.

9 Ornithology

9.1 Introduction

EIAR Chapter 9 - Ornithology assesses the potential ornithological effects of the Proposed Development on the local bird populations. The assessment considered the impacts associated with decommissioning the existing turbines, constructing the new turbines, operating the Proposed Development, and eventual future decommissioning.

The Site lies close to internationally and nationally important bird habitats, including the Orkney Mainland Moors Special Protection Area (SPA) and West Mainland Moorlands Site of Special Scientific Interest (SSSI). These areas are recognised for important breeding populations of species such as Red-throated Diver, Hen Harrier and Short-eared Owl. The nearby North Orkney SPA is also important for Red-throated Divers and wintering coastal birds.

Extensive ornithological surveys were completed between late 2024 and 2025, supported by historic bird survey information collected over many years at Burgar Hill. Existing turbine carcass search data covering more than 15 years was also reviewed to understand patterns of bird activity and collision risk around the current wind farm.

9.2 Existing Bird Populations

The surveys confirmed that the area around Burgar Hill supports a range of breeding and non-breeding bird species typical of Orkney moorland and farmland habitats. Species recorded close to the site included:

- Red-throated Diver;
- Hen Harrier;
- Short-eared Owl;
- Golden Plover;
- Curlew;
- Snipe;
- Redshank;
- Great Skua; and
- Great Black-backed Gull.

Several of these species are legally protected and are qualifying interests of nearby designations.

The assessment found that one pair of Red-throated Divers regularly breeds at Lowrie's Water close to the Existing Scheme. Hen Harriers and Short-eared Owls also breed in the wider surrounding moorland. Wader species such as Curlew, Snipe and Redshank breed within nearby rough grassland and wet field habitats.

9.3 Construction Effects

The main potential effects during decommissioning and construction are disturbance to breeding birds from noise, machinery movement and increased human activity.

The assessment concluded that, without mitigation, there could be temporary disturbance effects on several protected species, particularly Red-throated Diver, Hen Harrier and Short-eared Owl. However, detailed mitigation measures have been proposed in order to avoid significant impacts. Mitigation includes pre-construction surveys to be undertaken by a suitably qualified ecologist or Ecological Clerk of Works (ECoW) and timing of construction works to avoid any nesting areas and breeding seasons. This mitigation will be secured and controlled through planning conditions.

Key mitigation measures include:

- avoiding works close to sensitive breeding areas during key nesting periods;
- restricting works near Lowrie's Water during the Red-throated Diver breeding season;

- timing works around known Hen Harrier and Short-eared Owl nesting activity;
- avoiding night-time works near winter Hen Harrier roost areas; and
- ongoing ecological monitoring during construction.

With these measures in place, the assessment concluded that significant disturbance effects on protected SPA species can be avoided.

Some temporary disturbance to common breeding waders such as Curlew, Snipe and Redshank may still occur locally during construction. However, these effects are expected to be short-term and limited to the immediate vicinity of the works.

9.4 Operational Effects

The assessment also considered operational effects of the Proposed Development in terms of collision risk.

As the Proposed Development largely follows the layout of the Existing Scheme, the assessment concludes that additional displacement effects are likely to be very limited. Many bird species present at or near the Site are already accustomed to the Existing Scheme and associated activity.

Collision risk assessments were informed by historic monitoring data from the Existing Scheme. Over more than 15 years of carcass searches, relatively low collision rates were recorded for the key protected species. No Red-throated Diver or Hen Harrier collisions were recorded during this period.

Some collisions involving species such as Short-eared Owl, Curlew, Snipe and Great Black-backed Gull were identified historically, but at low levels. The assessment concluded that the predicted collision risk for the Proposed Development would not adversely affect the conservation status of these species or the integrity of nearby designated sites.

9.5 Cumulative Effects and Shadow Habitats Regulation Appraisal

The assessment also considered the combined effects of the Proposed Development alongside other operational, consented and in planning wind developments in Orkney.

Particular attention was given to cumulative impacts on the Orkney Mainland Moors SPA and North Orkney SPA. Population modelling and Habitats Regulations Appraisal work were undertaken for qualifying SPA species, especially Hen Harrier and Red-throated Diver.

The assessment concluded that, with mitigation in place, the Proposed Development would not result in adverse effects on the integrity of the designated sites, either alone or in combination with other developments.

9.6 Conclusion

The ornithology assessment identified several important bird species and sensitive habitats in the vicinity of the Site. However, the Proposed Development has been designed carefully to minimise impacts on birds through turbine siting, construction management and timing restrictions.

Following implementation of mitigation measures, the assessment concluded that the Proposed Development would not result in significant long-term adverse effects on protected bird populations or nearby designated nature conservation sites.

10 Hydrology and Hydrogeology

10.1 Baseline

The Proposed Development is located on the eastern slopes of Burgar Hill in Orkney. The Site occupies gently sloping ground below a broad upland ridge, with land falling westwards towards inland lochs and eastwards towards the coast at Eynhallow Sound. Landcover within the Site consists mainly of improved grassland used for livestock grazing, shaped by long-term agricultural management. Field drains and minor water channels cross the ground, collecting rainfall and directing it either west towards the Loch of Swannay or east to the sea. Beyond the main development area, particularly to the west and south-west, the landscape becomes more open and moorland in character, with heath, blanket bog and peatland on flatter and gently sloping ground. Small lochans and pools are also present within the wider study area.

Within the main infrastructure areas, peat is generally shallow and much of the ground is underlain by mineral soils typical of managed farmland. Deeper peat deposits are largely confined to the moorland areas beyond the footprint of the Proposed Development. Three private water supplies are located within the wider hydrological study area. The western part of the study area overlaps with designated moorland recognised for its blanket bog habitats and breeding bird populations. Localised wet flushes and damp heath occur in places, typically sustained by rainfall and surface water rather than deeper groundwater sources.

10.2 Predicted Effects

Potential construction impacts include increased runoff, erosion, and pollution from fuels, concrete, or disturbed soils. Without controls, these could affect burns flowing to nearby drains and burns, particularly during periods of heavy rainfall. Excavation of soils for foundations and cables could disturb shallow peat and mineral soils, creating a risk of erosion or silt-laden runoff.

During operation, activities would be limited to routine maintenance, involving small quantities of oils and lubricants. The likelihood of soil or water effects during this phase is low. Decommissioning would involve removal of above-ground infrastructure and reinstatement of disturbed areas, with effects similar in nature to construction but of shorter duration and smaller scale.

10.3 Mitigation

Environmental protection has been incorporated into the design of the Proposed Development. Infrastructure has been positioned to avoid deeper peat and sensitive wet areas where possible, and existing access tracks are reused to minimise new ground disturbance. Appropriate separation distances from water features are maintained wherever practicable.

During construction, drainage measures will ensure that clean rainfall is kept separate from construction runoff. Features such as cut-off ditches, cross-drains, infiltration trenches and settlement areas will slow the movement of water and allow sediment to settle before water is released back to ground.

Excavated soils and peat will be stored carefully and reinstated in their original sequence to support recovery of vegetation. Disturbed ground will be restored as soon as practicable. Fuels, oils and other potentially polluting materials will be stored securely and handled in accordance with best practice to prevent spills. Any water removed from excavations will be managed in a controlled manner to avoid impacts on surrounding land and water features.

All construction activities will be managed through a Construction Environmental Management Plan, which will set out detailed procedures for drainage control, pollution prevention, restoration and monitoring and will be agree

11 Traffic and Transport

11.1 Baseline

The Study Area has considered the following Mainland Orkney road network to be used by construction traffic, to facilitate the construction phase of the Proposed Development:

- A965 - between Kirkwall and Stromness
- A966 - between Finstown and Birsay
- A967 – between Stromness and Birsay
- A986 - between Finstown and Twatt
- Hundland Road (C7)
- Georth Road (site access road)

At this stage, it is proposed that turbine components will arrive at Hatson Pier, Kirkwall, and travel to the Site using one of two potential routes:

1. Option 1 (via A967)
2. Option 2 (via Hundland Road)

Both routes connect to the A966 and then to Georth Road, which leads directly to the Site.

In order to assess the impact of construction traffic on the Study Area, existing traffic data was obtained from the Transport Scotland and Department of Transport (DfT) databases, as well as from the publicly available data within planning applications of neighbouring projects. Traffic levels on most roads in the Study Area are relatively low, particularly heavy goods vehicle (HGV) traffic.

11.2 Predicted Effects

11.2.1 Construction Phase

The Proposed Development would lead to increased traffic volumes on a number of roads in the vicinity of the Site during the 12 to 18-month construction phase. The traffic assessment assumes all construction vehicles will use local roads, without factoring in possible on-site material sources or concrete production, which could reduce traffic.

Most roads are predicted to experience negligible to minor increases in total traffic, with no significant long-term effects, with the exception of both Hundland Road (if this route was selected) and Georth Road, which could experience more noticeable short-term effects. However, all significant effects are considered temporary and limited to the construction phase.

At peak construction (month 7), approximately 91 additional vehicle movements per day are expected. Around 69 of these would be HGVs, equivalent to roughly 6 HGVs per hour over a 12-hour working day. Although statistically, percentage increases appear high on some roads (due to low HGV levels), the actual quantity of additional vehicles is modest in absolute terms.

A detailed Construction Traffic Management Plan (CTMP) will be agreed with the Orkney Islands Council, Transport Scotland and Police Scotland, prior to the commencement of any works. Residual effects are therefore anticipated to reduce to minor adverse and not significant.

11.2.2 Operational

Transport demand during operation would be much lower than during construction, since during operation there would be only occasional visits from maintenance or inspection vehicles. These would be unlikely to amount to more than a handful of trips per day and would therefore not be significant. The transport impacts of the Proposed Development during operation have therefore been scoped out of assessment.

11.2.3 Decommissioning

The number of vehicle movements generated during decommissioning would likely be lower than the number generated during construction. Mitigation measures which may need to be implemented during decommissioning would be agreed with the key stakeholders in line with best practice measures at that time.

11.2.4 Cumulative Effects

In accordance with published guidance, cumulative effects are defined as those that may arise from the interaction of the Proposed Development with other committed or reasonably foreseeable developments that could generate construction traffic on the same sections of the local or strategic road network during an overlapping temporal period, within the surrounding Study Area.

As such, the cumulative assessment has considered third-party projects which either hold valid consent or are currently under/awaiting construction. Two other consented wind farm developments (Costa Head and Hammars Hill Extension) were considered in a worst-case scenario where construction overlaps. While modelling suggests potentially moderate cumulative effects on some roads, this assumes all projects peak at the same time - which is considered unlikely. In practice, construction programmes are unlikely to fully coincide with each project implementing its own traffic management measures. With mitigation, cumulative impacts are expected to be minor and not significant.

12 Shadow Flicker

EIAR Chapter 12 – Shadow Flicker evaluates the potential for shadow flicker effects to arise from the Proposed Development during operation, both individually and in combination with other nearby wind farms.

Shadow flicker can occur when the sun passes behind rotating turbine blades, creating a moving shadow that may pass across a window. This can briefly cause light levels inside a room to fluctuate. The effect only occurs indoors, under specific weather and sunlight conditions, and typically for short periods at certain times of the year.

Scottish Government guidance states that where shadow flicker may be an issue, developers should assess and quantify the effect. However, it advises that shadow flicker is generally unlikely to be a problem where turbines are located at least 10 rotor diameters from nearby dwellings.[1]

OIC follows this approach in its supplementary planning guidance, requiring an assessment where turbines are proposed within 10 rotor diameters of properties.

Research has also shown that due to the position of the sun in UK latitudes, turbines cannot cast shadows in all directions. There is a sector approximately 50 degrees either side of due south where shadow flicker cannot occur. This means properties in that zone will not experience shadow flicker regardless of distance. These findings remain relevant despite changes in government departments.

12.1 Baseline and Methodology

A study area extending 1,380 metres (equivalent to 10 rotor diameters) from the proposed turbines was defined. Within this area, 33 residential properties were identified and assessed.

Specialist software was used to calculate potential shadow flicker, using the specific coordinates of the proposed turbines and the residential properties under assessment. The assessment first considered a worst-case scenario, assuming continuous sunshine, turbines operating at all times, and no screening from vegetation or buildings. This produces a theoretical maximum figure.

The results were then adjusted to reflect more realistic local conditions, including:

- Average sunshine levels in Orkney (approximately 26% of daylight hours annually) based on local meteorological data, and
- Typical turbine operating time (around 90%).

This adjusted scenario provides a more representative estimate of what could occur in practice.

12.2 Predicted Effects

Under worst-case assumptions, the highest predicted level of shadow flicker is approximately 169 hours per year at the nearest property (H17, Cuppar). However, when realistic weather and operational factors are taken into account:

- The highest predicted level reduces to approximately 29 hours per year; and
- All other properties are predicted to experience less than 30 hours per year.

Therefore, shadow flicker from the Proposed Development is predicted to remain below the recognised threshold of significance of 30 hours per year at all assessed properties.

[1] ClimateXChange. (2017). Review of Light and Shadow Effects from Wind Turbines. Retrieved January 2024, from https://www.climatexchange.org.uk/media/2075/light_and_shadow_effects_from_wind_turbines_in_scotland_stages_1_and_2.pdf

12.2.1 Cumulative Effects

A cumulative assessment was undertaken to consider combined effects with nearby wind developments. Only one property (H33, Whitemire) required cumulative assessment, based on proximity to other proposed wind farms.

The predicted cumulative impact at this property is approximately 8 hours per year, which is also well below the 30-hour benchmark.

12.3 Mitigation

As predicted effects fall below the threshold considered significant, no mitigation is proposed. However, if shadow flicker were to cause issues in practice, turbines can be fitted with automatic shut-down systems that temporarily stop operation during conditions likely to generate shadow flicker.

13 Tourism and Recreation

13.1 Baseline

The Proposed Development is located at Burgar Hill within an established operational wind farm. Tourism is an important contributor to Orkney's economy, with visitors drawn to the islands' archaeology, cultural heritage, wildlife, and coastal scenery.

Within 5km of the Site there are several tourism attractions, including RSPB Birsay Moors, Eynhallow Church, Aikerness Beach, Click Mill, the Broch of Gurness, Swandro Iron Age Houses, and the Quern of Whisber coastal walk.

Recreational receptors within 5km include several Core Paths, the St Magnus Way long-distance route and the Orkney section of the National Cycle Network. The closest sections of these routes pass approximately 1.1km from the Site. Turbines are already a feature of the local landscape as part of the Existing Scheme.

13.2 Predicted Effects

During construction, potential effects would be temporary and relate mainly to increased traffic, short-term noise and the visual presence of cranes and construction activity. The requirement for tourism attractions or recreational routes to be physically closed is unlikely and none would be permanently altered. Effects would be localised, short in duration and experienced within the context of an existing wind farm.

During operation, effects would arise from changes in turbine height and appearance as part of the repowering of the Site. Turbines may be visible from some tourism attractions and recreational routes; however, these views would occur within a landscape where wind turbines are already present. Access, use and function of attractions and paths would remain unchanged.

Decommissioning effects would be similar to construction but shorter in duration.

Overall, effects on tourism and recreation are assessed as minor or negligible and not significant in EIA terms.

13.3 Mitigation

The Proposed Development represents a repowering of an existing wind farm and has been designed to minimise changes to established access routes and visitor infrastructure. Standard construction management measures will be implemented to reduce temporary disruption.

No specific mitigation measures are required for tourism or recreation.

14 Other Issues

14.1 Aviation and Radar

The Proposed Development has been assessed for potential effects on aviation and radar systems during construction, operation and decommissioning. Consultation has been undertaken with National Air Traffic Services (NATS), Highlands and Islands Airports Limited (HIAL), and the Ministry of Defence (MoD).

The Site lies approximately 21.5km from Kirkwall Airport and is outside the protected airspace surfaces associated with aircraft take-off and landing. The turbines would have a maximum tip height of 149.9m, remaining below the 150m threshold at which visible aviation lighting is normally required.

NATS and HIAL have confirmed that the turbine layout would not adversely affect airport operations or radar infrastructure. The MoD identified that the Site lies within a low-flying training area and has requested infra-red (IR) aviation lighting to ensure aircraft safety. This requirement will be addressed through agreement of an appropriate IR lighting scheme with the MOD and controlled through planning conditions.

With the implementation of IR lighting and formal notification to aviation authorities for charting purposes, the Proposed Development is considered acceptable in aviation terms, with no significant operational impacts anticipated.

14.2 Telecommunications and Utilities

An assessment has been undertaken to identify potential effects on telecommunications links and utility infrastructure within 1km of the Site.

Four telecommunications masts and associated fixed radio links are present in the surrounding area. The turbine layout has been designed to maintain appropriate separation distances from these links in accordance with industry guidance. Consultation has been carried out with operators including Arqiva, the Joint Radio Company (JRC), BT, Vodafone and others.

Most operators confirmed that their infrastructure would not be affected. Arqiva identified a rebroadcast link near the Site and requested continued consultation and maintenance of access during construction. The layout maintains appropriate separation from this link, and a planning condition will be accepted to investigate and resolve any substantiated effects on television or radio reception.

JRC identified a potential interaction with a fixed link supporting wind farm communications. Ongoing engagement has informed layout refinements, and mitigation measures will be agreed where necessary before construction proceeds.

Electricity infrastructure, including overhead lines and underground cables associated with the Existing Scheme, is present within the Study Area. Appropriate stand-off distances have been incorporated into the design, and standard construction practices will protect underground services. No gas pipelines are present.

With embedded design measures, continued liaison with infrastructure owners, and agreed mitigation where required, no long-term disruption to telecommunications or utilities services is anticipated.

14.3 Climate Change and Carbon Balance

The Proposed Development will generate renewable electricity, contributing to national and Scottish Government targets for reducing greenhouse gas emissions and achieving net zero.

Although greenhouse gas emissions will arise from turbine manufacture, construction activities and eventual decommissioning, these are expected to be offset by emissions savings during operation. A detailed carbon balance assessment has been undertaken using the Scottish Government Carbon Calculator.

Total predicted lifetime carbon losses are estimated at approximately 40,000 tonnes of carbon dioxide equivalent (tCO_2e). However, the Proposed Development is expected to generate around 104,000 MWh of electricity annually over a 40-year lifetime, equivalent to powering approximately 33,200 homes per year assuming average consumption of 3.1MWh per home per year.

The Proposed Development is expected to save approximately 21,600 tCO_2 per year compared to the current electricity grid mix, and up to 45,500 tCO_2 per year when compared to fossil fuel generation. Over its 40 year operational life, this equates to total carbon savings of over 860,000 tonnes of CO_2. The time taken for the Proposed Development to offset the emissions generated during its lifecycle (known as the carbon payback period) is estimated to be 1.9 years compared to grid electricity, and when compared against fossil fuel generation, the payback period reduces to approximately 0.9 years. After this relatively short payback period, the wind farm will deliver approximately 38 years of net carbon savings for the operational 40 year life.

Through careful siting to avoid deeper peat, application of good construction practice, and implementation of environmental management measures, the Proposed Development is expected to deliver a net benefit in terms of greenhouse gas reduction.

Overall, the Proposed Development will make a significant positive contribution to reducing greenhouse gas emissions and tackling climate change.

14.4 Health and Safety

Health and safety considerations have been integrated into the design, construction, operation and decommissioning of the Proposed Development in accordance with relevant legislation and best practice.

During construction, a Construction Method Statement and site-specific safety procedures will be implemented. All personnel will receive appropriate training and site inductions. Access to working areas will be controlled, and appropriate signage will be installed.

Modern wind turbines incorporate certified safety systems that continuously monitor performance and automatically shut down in the event of a fault or extreme weather conditions. Turbines will be fully certified to recognise international standards and designed to withstand severe climatic conditions.

Public access will remain managed and safe. Turbines are locked and inaccessible to unauthorised persons, and warning signage will be installed at access points. Lightning protection systems and emergency procedures will be incorporated as standard.

Overall, the Proposed Development will be constructed and operated in accordance with established health and safety regulations, and no unacceptable risks to workers or the public are anticipated.

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