

Non-Technical Summary

Greenside Extension

Client: Greenside Wind Energy Ltd.

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Version 1

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Greenside Wind Energy Ltd. | C5865-891 | Version 1

Report Prepared for:

Greenside Wind Energy Ltd.

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Table of Contents

1	Introduction & Background	4
1.1	Project Background	4
1.2	Environmental Impact Assessment Report	4
1.3	Structure and Content of the Planning Application	5
2	Proposed Development	6
2.1	Decommissioning	7
3	Design Statement	8
3.1	Site Selection	8
3.2	Site Constraints	8
3.3	Site Design	9
3.4	Summary	10
4	Planning Statement	11
4.1	Development Plan	11
4.2	Appraisal of Compliance with the Development Plan	11
4.3	Other Material Considerations	11
5	Landscape and Visual Impact Assessment	13
5.1	Introduction	13
5.2	Assessment Results	13
5.2.1	Landscape Assessment	13
5.2.2	Visual Assessment	13
5.2.3	Cumulative Landscape and Visual Effects	14
5.3	Summary	14
6	Cultural Heritage	15
6.1	Assessment Results	15
6.1.1	Direct Impacts	15
6.1.2	Indirect Impacts	15
6.1.3	Physical Impacts	15
6.2	Summary	15
7	Noise	17
7.1	Introduction	17
7.2	Summary of Predicted Impacts and Effects	17
7.2.1	Construction Noise	17
7.2.2	Operational Noise	17
7.3	Conclusion	17
8	Hydrology and Hydrogeology	18
8.1	Introduction	18
8.2	Sensitive Receptors	18

8.3	Mitigation Measures	19
8.4	Summary	19
<hr/>		
9	Traffic and Transport	20
9.1	Introduction	20
9.2	Overview of the Abnormal Load Route to Site	20
9.3	Construction Traffic	20
9.4	Summary	21
<hr/>		
10	Carbon Balance	22
10.1	Introduction	22
10.2	Summary of Predicted Impacts and Effects	22
<hr/>		
11	Shadow Flicker	23
11.1	Introduction	23
11.2	Summary	23
<hr/>		
12	Other Issues	24
12.1	Introduction	24
12.2	Socio-Economics	24
12.2.1	Introduction	24
12.2.2	Construction and Operation Phase Impacts	24
12.3	Aviation and Radar	24
12.3.1	Introduction	24
12.3.2	Impacts and Effects	24
12.4	Telecommunications	25
12.4.1	Introduction	25
12.4.2	Impacts and Effects	25
12.4.3	Summary	25
12.5	Safety	25
<hr/>		
13	Summary of Mitigation	27
<hr/>		
14	Ecology	28
<hr/>		
15	Ornithology	29

1 Introduction & Background

1.1 Project Background

Green Cat Renewables Ltd (GCR) have been appointed by the Applicant, Greenside Wind Energy Ltd., to prepare this Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) and to manage the application through the planning process with Aberdeenshire Council.

Greenside Wind Energy Ltd. Are seeking to explore opportunities to develop an extension to the existing wind farm at Greenside. It is believed that the landholding presents a great opportunity for developing a modest project, which would strike the right balance between avoiding significant impacts on the surrounding environment and optimising the productivity of the site, maximising the potential contributions to renewable energy targets.

The proposed development at Greenside is approximately 2-3km southeast of Crimond, Aberdeenshire and will comprise three wind turbines and associated infrastructure. The proposed turbines will have a tip height of up to 100m. Based upon the candidate turbine being considered for the development having a capacity of 2.35MW, the proposed Greenside Extension will have a total installed capacity of 7.05MW.

1.2 Environmental Impact Assessment Report

An EIAR is a means of drawing together, in a systematic way, an assessment of the likely significant environmental effects arising from a proposed development. It is a rigorous assessment of the potential environmental effects the development may have across a wide range of areas. The purpose of the assessment is to ensure that decision makers consider these environmental impacts when forming a decision on the planning application.

The EIAR is a report that pulls together the results of the assessments as part of the EIA. The EIAR includes a description of how the work was carried out and any assumptions that were used. It sets out the likely impacts of the development on the environment and describes the measures proposed to reduce any impacts (known as 'mitigation').

In line with the EIA Directive and the local planning policies, the EIAR covers the key environmental, technical and social issues associated with the proposed development.

The EIAR comprises the following chapters:

- Introduction & Background
- Proposed Development
- Design Statement
- Planning Statement
- Landscape and Visual Impact Assessment (LVIA)
- Noise
- Shadow Flicker
- Cultural Heritage
- Hydrology and Hydrogeology
- Ecology
- Ornithology

- Traffic and Transport
- Carbon Balance
- Other Issues (Socioeconomics, Aviation and Radar, Telecommunications)
- Summary of Mitigation

1.3 Structure and Content of the Planning Application

The application is comprised of the following documents:

- **EIAR** containing all Chapters as outlined in **1.2** above.
- **Non-Technical Summary** summarising the key findings of the technical assessments in a non-technical style for ease of understanding.
- **Supporting Figures and Drawings** includes all of the technical planning application drawings and any supporting figures utilised in the topic chapters.

All appendices have been attached to the EIA report.

Figures extracted from the planning application drawings have been inserted in the relevant EIAR sections where appropriate. Figures which have not been included within the report have been provide separately for viewing on the Council's website.

2 Proposed Development

The Proposed Development consists of the following infrastructure elements:

- Three, three-bladed horizontal axis wind turbines measuring up to 100m tip height;
- Hardstanding areas for cranes at each turbine location;
- Turbine foundations;
- Site access tracks;
- Drainage works;
- An on-site electrical substation and control network of buried cables;
- Temporary laydown areas;
- Temporary construction compound, including parking, and welfare facilities; and
- Associated ancillary works.

The candidate wind turbine used for the purposes of the assessments is the Enercon E-82 machine. The candidate wind turbine has a tip height of 100m and a height to hub of 59m. The dimensions of the turbine are shown in Figure 2.3 below.

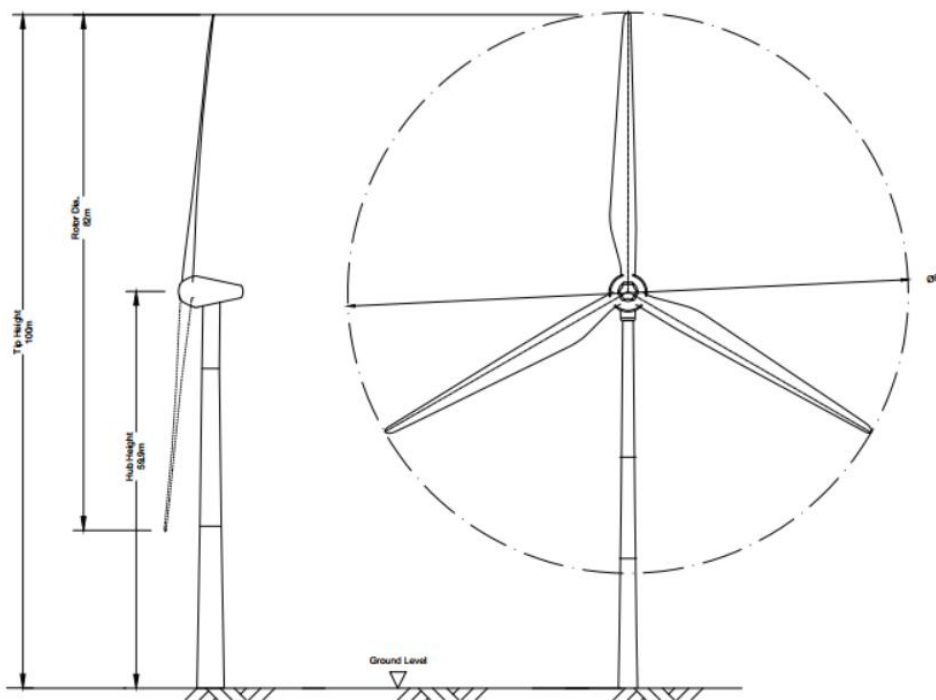


Figure 2.3 – 100m to tip turbine elevation drawing

New stretches of track will be required in order to reach the turbine hardstandings. These will typically be 4.0m wide with a 0.5m shoulder on each side and would consist of crushed stone to a depth dictated by ground conditions, generally between 300mm and 600mm.

Turbines will be constructed upon a gravity foundation with a base diameter of approximately 6.9m, and a depth of approximately 2.8m. Crane hardstanding areas are required at each turbine location to facilitate the erection

of the wind turbine. Further details about the specifications of all the infrastructure can be found in the **Chapter 3 – Project Description**.

2.1 Decommissioning

At the end of their operational life the turbines would be removed from the Site, and the foundations and hardstandings would be covered over with topsoil and re-seeded. The access tracks will remain in-situ to aid farming operations.

The electrical cables would be de-energised and left in place, with any cable marker signs removed. The electrical substation building would be demolished to ground level with the foundations covered with topsoil and re-seeded.

The decommissioning process would take between four to six months to complete. Decommissioning effects are not generally considered in detail at this stage. It is proposed that a decommissioning plan will be agreed with The Highland Council and relevant consultees prior to the end of life of the Proposed Development in line with planning conditions.

3 Design Statement

This statement provides a description of the site selection process and demonstrates how the site and its surroundings have been fully considered to ensure that the final design solution is the most suitable for the site.

Details are also provided on the alternative layouts that were considered before arriving at the final design.

3.1 Site Selection

The overall site selection and subsequent design process involved two main phases:

- A consideration of the overall design objectives.
- The iterative site selection phase which looked at site-specific constraints and opportunities.

This site offers an opportunity to expand the existing wind farm in a location where the Proposed Development would be able to add to the existing land use.

The existing Greenside Wind Farm provides wind speed data, and an established wind farm at that location which provides a good understanding of ground conditions and significant constraints on site, existing infrastructure such as grid connections and an established presence in the landscape.

The site selection also needs to take into account planning policy, wind speed, whether the site can be accessed easily and any environmental issues such as protected birds or protected areas.

3.2 Site Constraints

The next step in the design process is to identify all environmental issues and potential constraints on site and work out whether the wind farm is technically feasible. The best way to view and appreciate these issues is lay them out on a plan of the area (**Figure 3.1**).

Constraints were identified through the consultation process, site survey and desk-based assessment. Key constraints include:

- Fixed links / aviation;
- Residences (noise, shadow flicker and visual impacts);
- On site archaeology;
- Yield;
- Landscape; and
- Hydrology and topography.

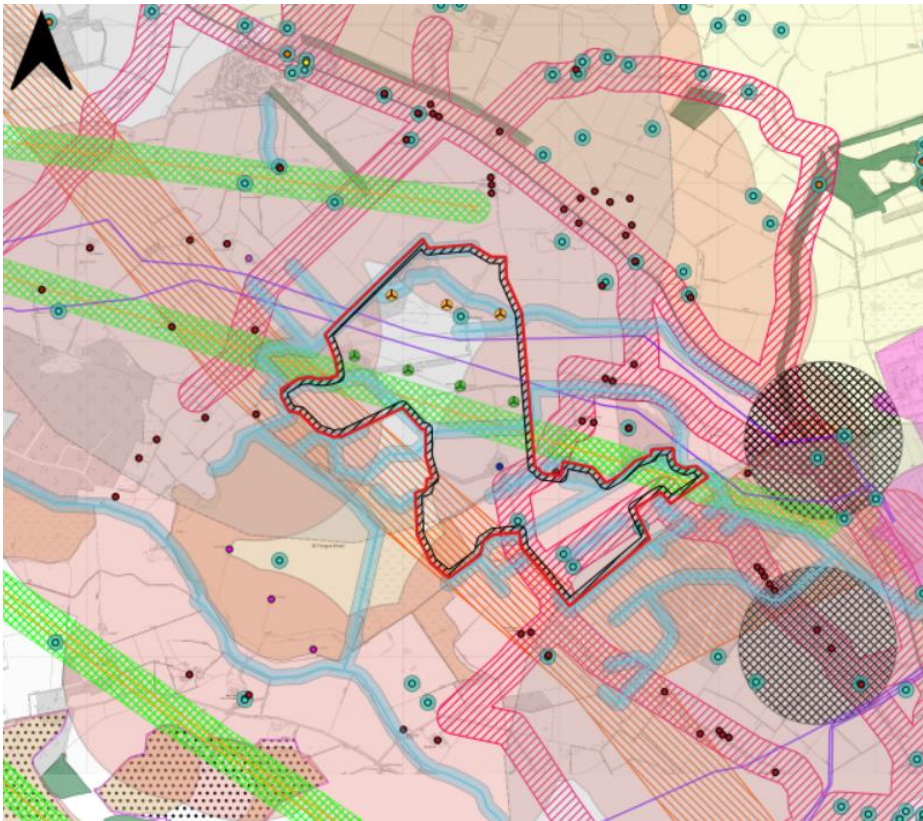


Figure 3.1 – Constraints Plan

3.3 Site Design

Once the constraints are mapped, the proposed wind farm can then be designed around those constraints.

The goal of the final layout of the turbines and tracks is to have the least impact on environmental features and neighbours and avoid any significant impacts. At the same time, the technical and commercial viability of the overall project has to be taken into account.

The site was deemed to have the capacity to accommodate a modest extension to the existing wind farm following the identification of the initial constraints of to the proposal site. The final wind development design would need to satisfy on-site constraints, whilst attempting to achieve preferable objectives relating to energy generation and carbon reduction, while minimising residential and visual impacts.

The final layout for the site, as shown in **Figure 3.2**, has been designed to find the right balance of these factors and take into account all available guidance.

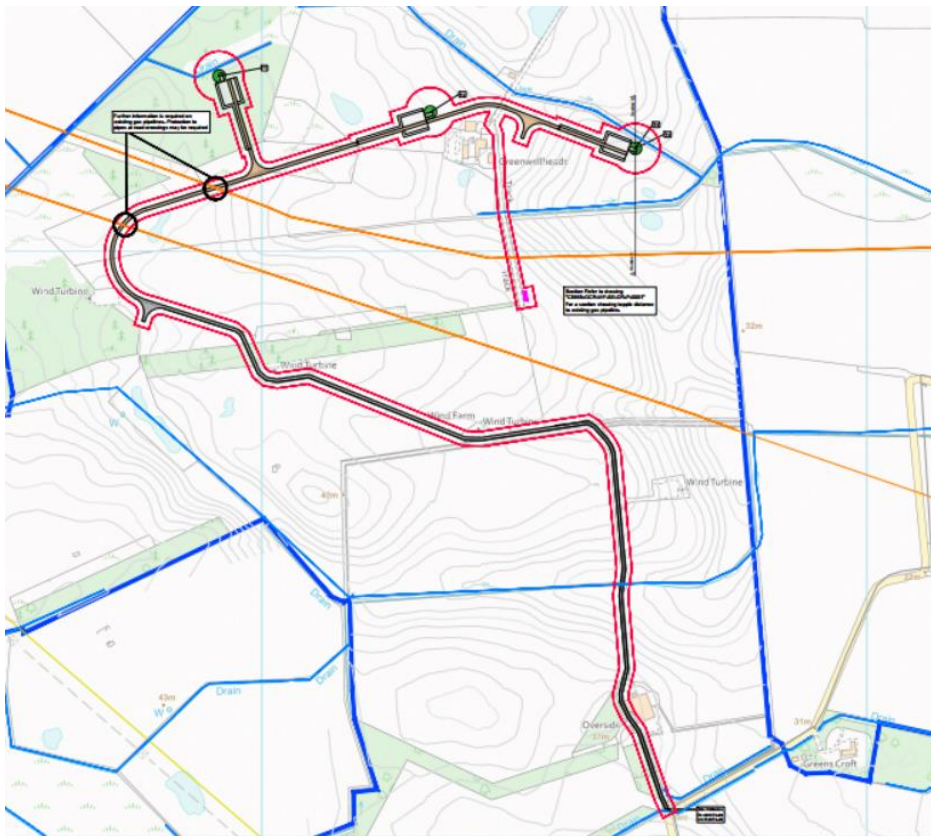


Figure 3.2 – Site Layout Plan

3.4 Summary

The final layout for the site, as shown in **Figure 3.2**, has been designed to find the right balance of these factors and take into account all available guidance. The resulting proposed development is for three wind turbines, up to 100m in height with associated infrastructure, including new access tracks and crane hardstandings.

4 Planning Statement

The Planning Statement sets out a summary of the proposed development in its context, provides a summary of the Development Plan, carries out an appraisal of whether the proposed development is in compliance with the Development Plan and assesses whether other material considerations indicate otherwise.

The proposed development is an extension to the existing and operational Greenside Wind Farm which was consented on 30 March 2012 under planning permission reference APP/2011/1024. It consists of four wind turbines with associated infrastructure and is located immediately to the north of the proposed development.

4.1 Development Plan

The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Policy Framework 4 (NPF4)¹, adopted February 2023, and the Aberdeenshire Council Local Development Plan (SLDP)⁶, adopted January 2023.

4.2 Appraisal of Compliance with the Development Plan

A summary table discusses the requirements of each policy and compares them to the proposed development. This provides a very brief summary of the information submitted to the application in order to assess the particular policy area and highlights the most relevant chapter of the EIAR for more detailed information.

The EIAR concludes that the proposed development is in compliance with the development plan.

4.3 Other Material Considerations

This section considers national planning policy documents and both local and national policy on climate change, renewables and wind energy. Ambitious carbon emission and renewable energy targets provide a driver for renewable energy delivery and it is considered that a positive material weight should be added to the planning balance in favour of the proposed development because of its contribution to national targets.

The planning history of a site can be material in the determination of the application.

- Various energy applications and related infrastructure:
 - Erection of 4 No. Enercon E70 2.3MW Wind Turbines (Height to Tip of Blade 99.5m) Turbine 1:(N405,695) (E854,905) Turbine 2:(N406,035) (E854815) Turbine 3:(N406,365) (E854,715) Turbine 4:(N406,705) (E854,615) (APP/2011/1024) – *Granted Planning Permission in March 2012*
 - Erection of Ground Mounted Solar Array (APP/2015/2949) – *Granted Planning Permission in October 2015*
 - Erection of 4 Enercon E70 2.3MW Wind Turbines (Height to Tip of Blade 99.5m) Turbine 1:(N405,695) (E854,905) Turbine 2:(N406,035) (E854815) Turbine 3:(N406,365) (E854,715) Turbine 4:(N406,705) (E85) without compliance with condition 14 (Noise Levels) of approved planning permission reference APP/2011/1024 (APP/2016/2575) – *Refused Planning Permission in December 2016*
 - Erection of 4 Enercon E70 2.3Mw Wind Turbines without compliance with condition 14 (Extension to Interval Between Monitoring Periods) of approved planning permission reference APP/2011/1024 (APP/2017/1071) – *Refused Planning Permission in June 2017*

¹ [National Planning Framework 4](#) Accessed 25/10/2023

⁶ [Aberdeenshire Local Development Plan](#) Accessed 25/10/2023

- Installation of 36.6MW Solar SV Park and Associated Infrastructure (APP/2019/0296) – *Granted Planning Permission in September 2019*

This planning history context has informed the design process for the Proposed Development.

5 Landscape and Visual Impact Assessment

5.1 Introduction

Landscape and visual impact assessment is concerned with the impact the development will have on the landscape character of Angus and the visual impact it will have on residents, tourists, recreational users of the landscape, road users and anyone else visiting the area. A Landscape and Visual Impact Assessment (LVIA), including a Cumulative LVIA, were undertaken for the proposed development in accordance with EIA regulations and current industry good practice. The LVIA is supported by a series of graphics and visualisations which form Volume IV: Landscape & Visual Impact (LVIA) Assessment Figures.

5.2 Assessment Results

5.2.1 Landscape Assessment

The Proposed Development is located within the Eastern Coastal Agricultural Plain LCA, within the Banff and Buchan Landscape Character Assessment and would affect a proportion of this area. This section of the LCA is described as agricultural with the influence of development, with 13 turbines within 5km of the Proposed Development, along with the presence of transmission masts, lines, the A90 and A953 and the gas terminal at St Fergus. Due to the medium to large scale of the landscape, it is accommodating for wind energy. The area in which the Proposed Development is situated may be considered more sensitive due to its proximity to St Fergus Moss.

Considering the wider area, the assessment has concluded that there will be no notable indirect effects from any of the other landscape character types or within the study area. Generally, the surrounding landscapes have been modified with roads, settlement pattern, pylons and wind turbines, and the Proposed Development would fit into this pattern. In addition to this, the turbines will always appear alongside the operational turbines at Greenside which mitigates the impact somewhat, as these turbines are already present in views from the same parts of these landscapes.

The Proposed Development is not situated within a nationally or locally designated landscape and as such would have no direct impacts on any designated landscapes. It would have some minor indirect impacts on the North East Aberdeenshire Coast SLA however due to the designations notable features being in the eastern direction, the Proposed Development would be rarely seen in conjunction with these. The Proposed Development would also have some minor indirect impacts on the Cairness GDL and the Crimmongate GDL, however these would be screened by woodland and would only create an impact upon the removal of this woodland.

5.2.2 Visual Assessment

It is concluded that, while there may be some major visual effects experienced by the closest visual receptors within ~2km due to the introduction of three, of up to 100m high turbines, wider impacts a limited and dimmish quickly, with the turbines being indistinct from the existing turbines. Only moderate/minor level of effect would be experienced on the A90 between Fraserburgh and Peterhead, and impacts from surrounding settlements beyond Crimmond would be limited. The turbines will feature in an area of landscape which is already characterised by wind turbines and therefore only slightly increases the existing visual influence.

5.2.3 Cumulative Landscape and Visual Effects

The Proposed Development will be an extension of the four already existing Greenside Wind Farm. North Lothian, St Fergus Moss, St Fergus and Ednie Farms also exist within 5km and all within the Eastern Coastal Agricultural Plain LCA. Greenside Extension has been positioned to minimise any cumulative effects by locating the turbine on the same section of landscape already characterised by these turbines and maintaining the linear pattern which they create. This keeps turbine development to the same section of landscape and by virtue of being a relatively modest extension, it does not exacerbate any existing landscape effects. The addition of these turbines does little to add to the cumulative effects that occur between Greenside Wind Farm and the turbines at North Lothian and St Fergus Moss. In addition to this, the LCA would not cross any thresholds which would alter the character of this LCA by virtue of cumulative impacts.

Cumulative views were therefore found to be limited and in all instances, it was found that the cumulative relationship the operational turbines already had with other schemes in the area was the same, even with the addition of the extension turbines.

5.3 Summary

The assessment has found that Greenside Extension can be accommodated in the landscape but may have a moderate impact when viewing in close proximity. The capacity study indicates that there is medium capacity for large-scale wind turbines within the Eastern Coastal Agricultural Plain LCA, however the areas around Mormond Hill and St Fergus Moss are already beyond capacity.

The design is a simple and logical extension, maintaining spacing and scale while also continuing the linear character of the wind farm. This avoids any visual clutter or visual confusion and would not overwhelm the character of the landscape, affecting a small section of the landscape already characterised by the Greenside turbines.

6 Cultural Heritage

Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. These include listed buildings, cairns, sub-surface archaeological remains and artefact scatters. Cultural heritage and archaeological features also include earthwork monuments as well as landscape features such as field boundaries and industrial remains. The aim of this study was to identify elements of archaeological and cultural heritage value that may be impacted upon by the Greenside Extension development.

6.1 Assessment Results

6.1.1 Direct Impacts

Direct impacts are physical impacts or changes to features of cultural heritage as a result of the proposed development. This could involve the disturbance of any buried features or the removal or moving of above ground remains. All known features within 200m of the turbines and 50m of the associated elements were considered.

One additional feature was found to be within 200m of the proposed turbine locations. The potential direct impact of the Proposed Development infrastructure on these features and on unknown archaeological features is assessed in **Chapter 6 – Cultural Heritage and Archaeology**.

In the event that unknown or unrecorded archaeological features are encountered, a suitable program of archaeological works will be implemented to the satisfaction of Aberdeenshire Council.

6.1.2 Indirect Impacts

Indirect impacts are those where the presence of the proposed development can alter the setting of a historical feature, without physically altering it. This can be as a result of visibility of the development from the feature, or views towards the feature containing the turbines.

The indirect impacts upon all of the historic features within 10km of the proposed development and within the Zone of Theoretical Visibility (ZTV) has been considered in the assessment. The findings of the assessment considered that all features which were affected ranged from none to moderate. This includes effects found on any Scheduled Monuments, Category 'A' or 'B' Listed Buildings and Gardens and Designed Landscapes taken forward for assessment.

6.1.3 Physical Impacts

One known archaeological feature was found to be within the development footprint of the Proposed Development during the desk-based assessment. One additional feature was found to be within 200m of the proposed turbine locations.

The setting impact upon heritage assets within 10km of the Proposed Development have been considered in the assessment. There are only two features within 2km of the Proposed Development, one category A Listed Building and one category B Listed Building. Although they are the closest features, the level of impacts will be of a moderate level and not considered significant.

6.2 Summary

With regards to physical effects, one feature is within the area of ground-breaking with one further feature within 200m of proposed turbine locations.

Within the 10km study area, undulating topography alongside intervening vegetation and buildings restrict visibility of the Proposed Development from many features. Views towards the Proposed Development are already characterised by the existing Greenside wind farm. This mitigates impacts which would arise from the addition of

the Proposed Development. With regard to setting effects, the level of effect ranges from **none** to **moderate**. This includes effects found on any Scheduled Monuments, Category 'A' or 'B' Listed Buildings and Gardens and Designed Landscapes taken forward for assessment.

7 Noise

7.1 Introduction

Noise can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The impact of noise can, therefore, be a material consideration in the determination of planning applications.

Noise impacts have the potential to arise from three distinct areas of wind farm development:

- The construction of the wind turbines.
- During the operation of the wind turbines.
- Cumulative noise from surrounding wind farms.

The Noise Impact Assessment (NIA) considered potential noise impacts associated with the construction and operation of Greenside Extension, a proposal consisting of 3 wind turbines and ancillary infrastructure. An assessment considering operational noise from the existing Greenside Wind Farm (GWF) was also considered.

The operational noise assessment took the form of a desktop assessment that considered operational noise from the proposed extension in isolation and with GWF against existing noise limits.

7.2 Summary of Predicted Impacts and Effects

7.2.1 Construction Noise

The highly conservative noise impact assessment carried out for the construction phase of the Proposed Development demonstrated that the project would not exceed the limit of 65dB(A) for daytime hours and 55dB(A) for evening hours as per BS 5228-1. As such, construction noise is not expected to have an adverse impact on nearby receptors and could be adequately controlled via a suitably worded planning condition.

7.2.2 Operational Noise

Operational noise from the proposed project was assessed using propagation modelling in accordance with IoA GPG guidance. Using conservative baseline data from 2018 compliance monitoring of GWF, a noise modelling exercise was undertaken to assess potential impacts from the Proposed Development.

When considering the Proposed Development in isolation, maximum predicted immissions at the two nearest receptors of 36.9dB(A) at NAL1 (Tillyduff) and 35.7dB(A) at NAL2 (Tophead) were predicted. All other properties were predicted to receive levels of <35dB(A).

An assessment of predicted operational noise immissions from the Proposed Development and GWF found that the expanded (7 turbine) GWF project would comply with existing noise limits.

It is therefore concluded that the development could be accommodated in the area without significant impact on amenity at the surrounding receptor locations.

7.3 Conclusion

It was concluded that the proposed project would meet appropriate noise limits during both construction and operational phases of the development, and that the immission levels of the Proposed Development and GWF are expected to have a low to negligible impact on all third-party receptors within the study area. As such, the proposed turbines can be accommodated in noise terms.

8 Hydrology and Hydrogeology

8.1 Introduction

Understanding surface and groundwater environments is critically important to designing a successful project. The hydrology assessment considers the potential effects of the Proposed Development on surface water and ground water.

Surface water includes watercourses, waterbodies and run off. Surface water provides important water resources for potable and industrial supplies, as well as other benefits such as amenity, aesthetic value, conservation, ecological environments, and importantly for recharge to groundwater systems. Groundwater includes all water stored in permeable underground strata (or aquifers). Groundwater is also an important resource, providing more than a third of the potable water supply in the UK. In addition, it provides essential baseflow to rivers and wetland areas, often supporting important ecological systems.

The risk of pollution or disruption of watercourses, groundwater bodies, and private water sources, within or near the Site, needs to be assessed and appropriately mitigated where necessary. Potential impacts could include:

- Erosion and sedimentation
- Impacts to surface runoff characteristics
- Impacts on surface water quality
- Impacts on river flows and flooding
- Impacts on groundwater dependent terrestrial ecosystems (GWDTE)
- Impacts on soils
- Impacts on peat hydrological regime
- Chemical pollution of groundwater
- Disruption or fouling of private water supplies
- Impacts on public water supplies and abstractions
- Modifications to hydrogeological regime
- Peat Slide Risk

8.2 Sensitive Receptors

It was identified that the nearest classified surface waterbody within the study area is the Black Water u/s St Fergus waterbody, situated in the southern study area. At its closest point, it sits approximately 114m from the Proposed Development. Additionally, there are several drain networks associated with the surrounding farmland and forestry that intersect various sections of the study. Particularly, there are two drains that feed from the small pocket of forestry and run adjacent to the Proposed Development. In addition, the Flood Risk and Hazard Map identified an area of high-risk surface water flooding directly north of the Proposed Development.

There is one Private Water Supplies (PWS) within the study area. The PWS sits on a lower elevation and is c.0.5km from the Proposed Development at its closest point. It was confirmed with the landowner during the site visit that the property is supplied by mains at present, and that the PWS is not active.

According to the Carbon and Peatland Map 2016, there is an area of Class 1 Peat along the fringes of the south-western study area situated c.0.8km from the development. Class 1 Peat is considered to be nationally important soil and to be of high conservation value.

8.3 Mitigation Measures

Proposed mitigation measures can be grouped under three headings:

- Mitigation built into the design. The design process has aimed to reduce environmental impacts through careful siting of proposed infrastructure.
- Adoption of Best Practice during construction, including further micro-siting where required.
- Restoration and enhancement of the site post-construction.

Chapter 13 of the EIA Report details a full summary of proposed mitigation measures.

8.4 Summary

A desk-based study and site walkover were conducted to establish the baseline hydrological environment of the site, whereby potential impacts from the development were identified.

It was determined that there were three categories of sensitive receptor within the study area, these being: Surface Water Features, including the Black Water u/s St Fergus River and its tributaries; Fraserburgh and Mintlaw Groundwater Units; Private Water Supplies; Class 1 Peat; and vegetation characteristic of Class 1 and Class 2 groundwater dependent terrestrial ecosystems (GWDTE).

It is anticipated that careful design of the site layout, and the implementation of the mitigation methods proposed, will ensure that any potential risks identified are avoided and the associated risk is reduced to acceptable levels.

9 Traffic and Transport

9.1 Introduction

The following section highlights the potential impacts and the measures to be taken to minimise traffic disruption. Due to the dimensions of the turbine sections and construction vehicles required, careful assessment of the access route is required.

9.2 Overview of the Abnormal Load Route to Site

One site access option has been considered within the study, the route is detailed below:

- Exit Peterhead Port using Merchants Quay Road;
- Turn left onto Charlotte Street;
- Continue along Charlotte Street until the junction;
- Turn left at the junction to join Kirk Street;
- Continue westbound on Kirk Street for approximately 200m until the roundabout;
- Take the second exit at the roundabout to join the A950;
- Continue westbound along the A950 for approximately 2.2km until the Howe o' Buchan Roundabout;
- Take the second exit at the roundabout and continue westbound on the A950 to Longside;
- Navigate through the town of Longside remaining on A950
- Continue Westbound on A950 to Mintlaw
- At the roundabout turn right contraflowing the normal flow of traffic onto the A952 northbound, North Street;
- Continue north on the A952 traversing a single roundabout for approximately 11km;
- Turn right onto the A90 south-east bound;
- Continue approximately 13km south on A90 towards St. Fergus;
- Turn right at the crossroads to join Newton Road;
- Travel through the settlement of St Fergus for approximately 1.5km and turn right to join South Essie Road;
- Continue along South Essie Road for approximately 2km and enter the Site.

9.3 Construction Traffic

The estimated delivery loads for the construction of the wind farm have been provided in **Chapter 13** of the EIAR. Construction activities will take place over several months and the requirement for construction material deliveries will be spread throughout this period.

Deliveries will be scheduled to avoid peak hours when the roads are busiest. While delivery routes will vary depending on the source of the materials, it is expected that the majority of vehicles will follow a similar route to the turbine delivery vehicles described above.

Following consent of the proposed development, a comprehensive Abnormal Load Routing Plan and Construction Traffic Management Plan will be produced and agreed with the Council. This will lay out finalised work programme and schedule of deliveries any required management measures in detail.

9.4 Summary

A suitable route to the site has been identified to be viable. The finalised route will be presented as part of the Abnormal Load Routing Plan and Construction Traffic Management Plan. There is potential for mitigation of a number of movements through the use of local quarries to procure materials which will be investigated further. We have demonstrated that the turbine components can be safely delivered to the site and that suitable management plans will be enacted in agreement with the LPA and other key stakeholders, post consent.

10 Carbon Balance

10.1 Introduction

This chapter considers the potential impact of the proposed wind turbines on climate change. The UK and Scottish Governments have developed ambitious targets for tackling climate change:

- The UK Government, in the 2008 Climate Change Act, made a commitment to reduce the UK's emissions of CO₂ by 34% (on 1990 levels) by 2020 and 80% by 2050.
- The Climate Change (Scotland) Act 2009 sets in statute the Government's Economic Strategy target to reduce Scotland's emissions of greenhouse gases by 80% by 2050 (on 1990 levels), with an interim reduction target of at least 42%. These targets will be achieved through an investment in energy efficiency and clean technologies such as renewable energy generation.

The committee on Climate Change has published advice for the new Scottish Climate Change Bill, which also feeds into the Scottish Energy Strategy: The Future of Energy in Scotland (2017). The proposal advocates the 2020 target of a 56% reduction on 1990 emissions, with a further interim target set for 2030 of a reduction of 66% on 1990 levels, with an overall goal of an 80% reduction in harmful greenhouse gases by 2050.²

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a legally binding target for Scotland to reach net-zero GHG emissions by at least 2045. In addition to the net-zero target for 2045, the Act commits Scotland to interim emission reduction targets of 75% by 2030 and 90% by 2040 (based on 1990 levels).³

Renewable electricity generated by wind turbines is already considered to be the cheapest form of new electricity generation⁴ and as such, has a vital role to play in achieving the ambitious targets set by both the Scottish and UK Governments.

10.2 Summary of Predicted Impacts and Effects

Following the guidance set out by NatureScot and the Scottish Government it is calculated that the proposed development will result in the saving of approximately **131,150 tonnes of CO₂** over the lifetime of the development.

² <https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/> - (Accessed March 2021)

³ <https://www.legislation.gov.uk/asp/2019/15/contents/enacted> - (Accessed March 2021)

⁴ <https://www.renewableuk.com/general/custom.asp?page=WindEnergy> – (accessed March 2021)

11 Shadow Flicker

11.1 Introduction

Tall structures such as wind turbines cast shadows. The shadows vary in length according to the sun's altitude and azimuthal position. Under certain combinations of geographical position and time of day, the sun may pass behind the rotor of a wind turbine and cast a moving shadow over neighbouring properties. Where this shadow passes over a narrow opening such as a window, the light levels within the room affected will decrease and increase as the blades rotate; hence the shadow causes light levels to 'flicker' - an effect commonly known as 'shadow flicker'.

Whilst the moving shadow can occur outside, the shadow flicker effect is only experienced where the shadow passes over a narrow window opening for a naturally illuminated space.

11.2 Summary

Four properties were assessed within the shadow flicker study area. Once realistic meteorological and operational factors were considered, H3 (Thornfield) was noted to have the largest impact with an expectation of around 10 hours of shadow flicker per year, which is comfortably below the 30 hours threshold of significance.

A cumulative assessment was carried out to identify the potential for cumulative shadow flicker effects as a result of operational and proposed turbines in the surrounding area. The cumulative assessment identified H2, H3 & H4 had the potential to be influenced by cumulative shadow flicker from the existing Greenside Wind Farm. Results from the cumulative assessment found that the maximum expected realistic hours of flicker per year at each location was around 18 hours per year, remaining below the 30-hour threshold.

As such, shadow flicker is expected to have a low and not significant impact on nearby sensitive receptors.

12 Other Issues

12.1 Introduction

This chapter sets out the approach to any other assessment topics to be considered within the EIA Report. Topics covered include:

- Socio-Economics
- Aviation and Radar
- Telecommunications
- Safety

12.2 Socio-Economics

12.2.1 Introduction

The Greenside Wind Farm Extension will result in economic benefits, mainly during the construction phase.

12.2.2 Construction and Operation Phase Impacts

The Proposed Development will provide a range of positive opportunities for the local, regional, national, and overseas economies. Of particular interest to this assessment are those which will benefit the local economy in Aberdeenshire. It is estimated that over the duration of the construction and operational phase of the Proposed Development that:

- Up to £1.2 million will be spent within the local economy across the construction and operational phases;
- Up to 9 jobs will be created across Aberdeenshire, with up to 25 estimated for Scotland as a whole;
- Up to £600,000 in GVA will be contributed to the local economy.

12.3 Aviation and Radar

12.3.1 Introduction

Wind turbines have the potential to affect civil and military aviation during operation. These impacts include but are not limited to:

- Physical obstructions;
- Generation of unwanted returns on Primary Surveillance Radar (PSR);
- Adverse effects on overall performance of Communications, Navigation and Surveillance (CNS) equipment

12.3.2 Impacts and Effects

A list of consultees with aviation interests in the area was identified based upon advice given in Scottish Planning Policy. The proposals were assessed for conflicts with existing aviation and radar infrastructure via direct consultations with the relevant stakeholders.

These consultees include:

- National Air Traffic Services (NATS)
- Ministry of Defence (MoD)

- Aberdeen Airport
- Met Office

Independent assessment has identified no significant aviation impacts are likely as a result of the Proposed Development. It should be noted that the MoD, NATS, Aberdeen Airport and the Met Office all had no objections to the original Greenside Wind Farm application.

12.4 Telecommunications

12.4.1 Introduction

By their nature, operational wind turbines have the potential to interfere with television reception, fixed telecommunications links and utilities. A list of consultees with telecommunications and other infrastructure interests in the area was identified based upon advice given in Scottish Planning Policy. The proposals were assessed for conflicts with telecommunications infrastructure, via direct consultations with relevant stakeholders.

12.4.2 Impacts and Effects

The Ofcom Spectrum Information Portal was consulted to determine the presence of fixed telecommunications links in the vicinity of the development. The Ofcom Spectrum Information Portal identified two fixed links in the vicinity of the development site: one located 600m south of the nearest proposed turbine operated by Telefonica, and another located 650m north of the nearest proposed turbine operated by the Joint Radio Company (JRC).

A SSEN Transmission line was also identified running across the western edge of the Site Boundary. An appropriate buffer was applied to this, and as the operational Greenside Wind Farm turbines sit between this line and the proposed turbines, it is not anticipated that this line will have any impact on the Proposed Development.

Furthermore, a minor 11kV SSEN Distribution line was identified approximately 180m north of the nearest proposed turbine. No impacts are anticipated from this due to its small scale, but if it is still installed at the time of construction, mitigation is available through re-routing of the line underground if this is judged to be required.

12.4.3 Summary

The Applicant will work closely with telecommunications operators to ensure that there are no unacceptable impacts on any fixed links.

No impacts are currently anticipated on television infrastructure or on the identified SSEN Transmission and Distribution lines.

12.5 Safety

This chapter covers the range of measures in place to ensure the safety of the workforce and the public. It details the approach to ensure safe operation and maintenance, turbine safety, safety during adverse weather conditions and public safety.

The chapter highlights the requirements of construction regulations and legislation as well as best practice.

Modern wind turbines have a proven track record for safety, and the turbines proposed will be constructed and operated in accordance with relevant health and safety legislation. Commercial sized turbines are particularly reliable, requiring minimal intervention and maintenance during operation. They are designed to cope with extreme wind and weather conditions.

Only turbines with a proven record of safety and reliability will be selected for this site.

The risk of ice throw (ice falling or being thrown from a turbine during particular circumstances) is also low. An ice detection system on the turbines will ensure they are deactivated if there is a risk of ice throw. As a further safety

measure, notices at access points alerting members of the public of potential risks under certain conditions will be provided.

The development site is an area of open agricultural land with scattered farmsteads. In terms of access, the potential for interaction between members of the public and the development are low. The site's location has been given detailed consideration throughout the design process and appropriate separation has been included between all infrastructure elements and the nearest residential receptors, paths, public rights of way and any other access points to the development site.

The assessment undertaken shows that there are no likely significant effects on human health through the safe operation of the Proposed Development, Greenside Extension Wind Farm.

13 Summary of Mitigation

See **Chapter 13 - Summary of Mitigation**. The Summary of Mitigation is a live document and will be updated as any new mitigation measures are identified.

14 Ecology

A review of the ecological interests of the site and potential impact of the proposal on ecology over a wider area was undertaken. Initially this comprised a habitat survey over the development site within 200m of the proposed turbine locations.

The construction of the Proposed Development will cause the loss of and disturbance to habitats during construction and the effects may be both permanent and temporary however temporary losses can be assumed to be relatively limited in extent, based on experience of the construction of similar developments, and so are assumed, on a *precautionary principle*, to equate to approximately 20% of the areas permanently lost.

During the habitat survey, very low levels of bat foraging and commuting activity of common and widespread bat species of low to moderate population vulnerability were recorded within the Site. Furthermore, no bat roosts were recorded within the Study Area.

The EIA Regulations require the cumulative effects of the Proposed Development with other relevant projects or plans to be assessed. Cumulative effects are particularly important in EclA as ecological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause irreversible decline. Cumulative impacts are only likely to influence the more mobile species such as bats, mountain hare and badgers.

It is therefore considered that this is unlikely due to the low levels of bat activity recorded at the site. The habitats and other species present at the site are not anticipated to be affected by cumulative impacts.

Four NVC (National Vegetation Classification) communities were recorded within the respective study area. Non-NVC habitat types present included conifer and broadleaved plantation, watercourses, ditch systems, ponds, scattered trees and scrub. The most common vegetation types (Phase 1 and NVC) within the study area (Tables 6 & 7) included modified grassland (71.54%) for grazing followed by conifer plantation (11.30%).

There are no plant species from the habitats recorded on site that are considered critically endangered, endangered or vulnerable.

The protected species surveys confirmed presence of brown hare. No signs of badger, pine marten, water vole, otter or red squirrel were recorded within the Ecological Study Area. Appropriate mitigation measures from Brown Hare habitats have been considered within **Chapter 14 - Ecology**.

The applicant has also committed to reduce any adverse environmental effects and to provide significant enhancements for important ecological features and biodiversity enhancement at the Proposed Development. The proposal for enhancement has initially included the enhancement of Terrestrial Habitats and Watercourse Habitats.

A selection of other biodiversity measures have also been considered to ensure the opportunities for enhancement can be achieved. These additional biodiversity measures are of an ecological and practical nature and include the most suitable and locally appropriate biodiversity measures specific for the location, site and proposed development. Thus, to further improve the site the following species-specific habitat provisions are recommended;

- Bat and bird roosting boxes to be installed with the retained trees along the plantation edges;
- Refugia/hibernacula in the form of external and buried log piles within areas of open space to provide suitable shelter for amphibians and reptiles and to further enhance biodiversity.

Following the application of mitigation, such as habitat management plans, biodiversity enhancement plans, species protection plans and standard working methods and good practice measures, such as a CEMP and pollution prevention measures, no significant residual effects are predicted as a result of the Proposed Development.

15 Ornithology

This chapter of the EIA Report will consider the likely significant effects associated with ornithology and designated sites as a result of the proposed three turbine Greenside Extension Wind Farm.

The area surveyed was within a 500m radius of the Red Line Boundary in line with the appropriate guidance.

The survey demonstrated that breeding birds of interest recorded in the survey area were limited. Birds recorded on the open fields were skylark and oystercatcher. No curlew, lapwing, snipe, hen harrier, merlin or short-eared owl breed on Site. Breeding birds in the nearby plantations are as expected and include goldcrest, bullfinch, wren, robin, chaffinch etc. In the marsh and reed areas sedge warbler, reed bunting and grasshopper warbler were present.

Standard mitigation is proposed that a pre-construction breeding bird survey be undertaken if construction work is carried out in the bird-breeding season of March- July inclusive.

The Site is approximately 3.5km distant from the southern tip of the Loch of Strathbeg SPA, designated for various geese, ducks and wildfowl assemblage. The species that could possibly be utilising the Site for foraging would be pink-footed goose, greylag goose, barnacle goose and whooper swan.

The majority of geese flights were recorded at height with flocks of geese heading to distant foraging grounds.

Current research on pink-footed goose and collision avoidance (Drachmann et al 2021) at a Danish onshore windfarm has shown that pink footed geese avoid turbines by flying further away, and that the avoidance rate for geese in CRM is now calculated as 99.8%.

Due to the small size of the Site, the habitat present and the ornithological survey results, it is considered that the integrity of qualifying species and habitats for designated sites (SPA) within the specified distances as recommended by NatureScot would not be impacted upon. No foraging areas for species designated for the SPA will be lost and connectivity between the SPA and existing foraging areas will not be impacted.



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