



Dunside Wind Farm

Environmental Impact Assessment Report (EIA Report)

Volume 1: Non-Technical Summary (NTS)

June 2023

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Prepared by
LUC
on behalf of
EDF Energy Renewables Ltd

June 2023



Preface

This Non-Technical Summary (NTS) accompanies an Environmental Impact Assessment Report (EIA Report) which has been prepared in support of an application by EDF Energy Renewables Ltd (EDF-ER) ('the Applicant') to the Scottish Government Energy Consents Unit (ECU) for Section 36 consent to construct and operate Dunside Wind Farm ('the Proposed Development'). The proposed site (the Site) is located approximately 6 km north of Westruther and 7 km west of Longformacus in the Scottish Borders Council (SBC) administrative area. The Proposed Development will comprise up to 15 wind turbines with battery storage and other associated infrastructure.

The EIA Report comprises the following volumes:

- Volume 1: Non-Technical Summary (NTS) (this volume);
- Volume 2: Main Report;
- Volume 3a: Figures;
- Volume 3b: Visualisations;
- Volume 4: Appendices; and
- Volume 5: Confidential Documents.

In addition to the above, the application is accompanied by a Planning Statement, a Pre-Application Consultation (PAC) Report and a Socio-Economic and Tourism Assessment.

A hard copy of the EIA Report will be available for public viewing during the application consultation period at the following address:

Haddington Library	Scottish Borders Council Office	Westruther Village Hall
15 Lodge St,	Council Headquarters,	6 Edgar Road,
Haddington	Newtown St. Boswells, Melrose,	Westruther, Gordon,
EH41 3DX	TD6 0SA	TD3 6ND

A copy of the NTS can be requested free of charge. A hard copy of the EIA Report is available on request for £500. All documents are available to download from the project website (dunsidewindfarm.co.uk) or can be posted upon request in electronic format on USB free of charge.

The EIA Report will also be available for public viewing online via the Scottish Government ECU planning portal (<https://www.energyconsents.scot/ApplicationSearch.aspx>)

Any public representations to the application may be submitted via the ECU website at www.energyconsents.scot/Register.aspx; by email to the Scottish Government, Energy Consents Unit mailbox at representations@gov.scot; or by post to the Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the proposal and specifying the grounds for representation. The Applicant will advertise the submission of the Section 36 application in the local and national press and on the dedicated project website. The advert will state the deadline for submitting representations to Scottish Ministers.

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1. Introduction

Background

1.1 This document is a Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIA Report) which accompanies an application for development consent made by EDF Energy Renewables Ltd ('the Applicant'). The NTS summarises the findings of the Environmental Impact Assessment (EIA) which has been undertaken by LUC and technical specialist consultants on behalf of the Applicant to assess the effects of the construction operation and decommissioning of Dunside Wind Farm (hereafter referred to as 'the Proposed Development').

1.2 The Proposed Development is located on a plateau of rolling hills separated by the steep sided valley of the Dye Water, which runs west-east through the Site, and lies within the Scottish Borders Council (SBC) administrative area. The location of the Proposed Development is shown in **Figure 1**.

1.3 The Proposed Development will comprise up to 15 turbines, each up to a maximum blade tip height of 220 metres (m), with associated infrastructure and a battery storage facility. As the Proposed Development will have an installed capacity of over 50 megawatts (MW), consent is required from the Scottish Ministers (via the Energy Consents Unit (ECU)) in consultation with consultees including SBC¹. The consenting process for energy generation projects over 50 MW is set out under Section 36 of the Electricity Act 1989. As part of this Section 36 application deemed planning permission will also be requested under Section 57 of the Town and Country Planning (Scotland) Act 1997 (as amended) to construct and operate the Proposed Development.

The Applicant

1.4 The application will be made EDF Energy Renewables Ltd., part of one of the world's largest electricity companies. The Applicant has an operating portfolio of 37 wind farms in the UK as well as battery storage units providing new affordable, low carbon electricity. The Applicant operates under the brand "EDF Renewables".

Environmental Impact Assessment (EIA)

1.5 An EIA is carried out where a Proposed Development has the potential to result in significant environmental effects. As it is considered possible that the Proposed Development may result in significant environmental effects, an EIA has been undertaken to accompany the application for Section 36 consent.

1.6 EIA involves the compilation, evaluation and presentation of any likely significant environmental effects resulting from a Proposed Development, to assist the consenting authority, statutory consultees, and wider public in considering an application.

1.7 EIA is an iterative process whereby the identification and assessment of effects can also inform the design of a Proposed Development so that potentially significant adverse environmental effects can be avoided, reduced and if possible, removed at an early stage. Where potentially significant environmental effects cannot be avoided through the design process, these effects can be reduced through the use of mitigation measures.

1.8 The EIA Report presents information on the identification and assessment of the likely significant environmental effects resulting from the Proposed Development across a number of environmental topics. The significance of these effects has been assessed using criteria defined in the topic chapters of the EIA Report. Where appropriate, or as otherwise defined, the significance of effects has been categorised as major, moderate, minor or negligible. In the context of THE Environmental Impact Assessment (EIA) under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations') likely effects assessed as being of '**Major**' or '**Moderate**' significance are considered to be significant effects.

1.9 The scope of the EIA was informed by the Scoping Opinion provided by the Scottish Government ECU in May 2022, and included comments from a number of consultees, including SBC and NatureScot².

1.10 As required by the EIA Regulations, the EIA Report has been prepared by 'competent experts' in the relevant environmental specialisms.

Overview of the Site

1.11 The Site is located within the Lammermuir Hills in the northern part of the SBC local authority area. The Site is approximately 6 kilometres (km) north of the settlement of Westruther and 7 km to the west of the settlement of Longformacus (to the nearest proposed turbine). The topography of the site consists of a plateau of rolling hills separated by the steep sided valley of the Dye Water which runs west-east through the Site. The closest settlement to the Site is Westruther. There are a cluster of dwellings at Byreclough in the east of the Site, accessed via a private track and minor road from Longformacus. Other residential properties within 2-3 km of the Site include Trottingshaw and Dye Cottage to the east and Killpallet to the north.

1.12 The area where the turbines are proposed to be sited comprises a plateau of rolling hills separated by the steep sided valley of the Dye Water, running west-east through the Site. The landcover on the Site consists mainly of heather moor acid grassland and some areas with sparse tree cover.

1.13 The Dye Water runs west-east through the Site. The Dye Water is a tributary of the River Tweed. Multiple smaller watercourses join the Dye Water and further cross the Site.

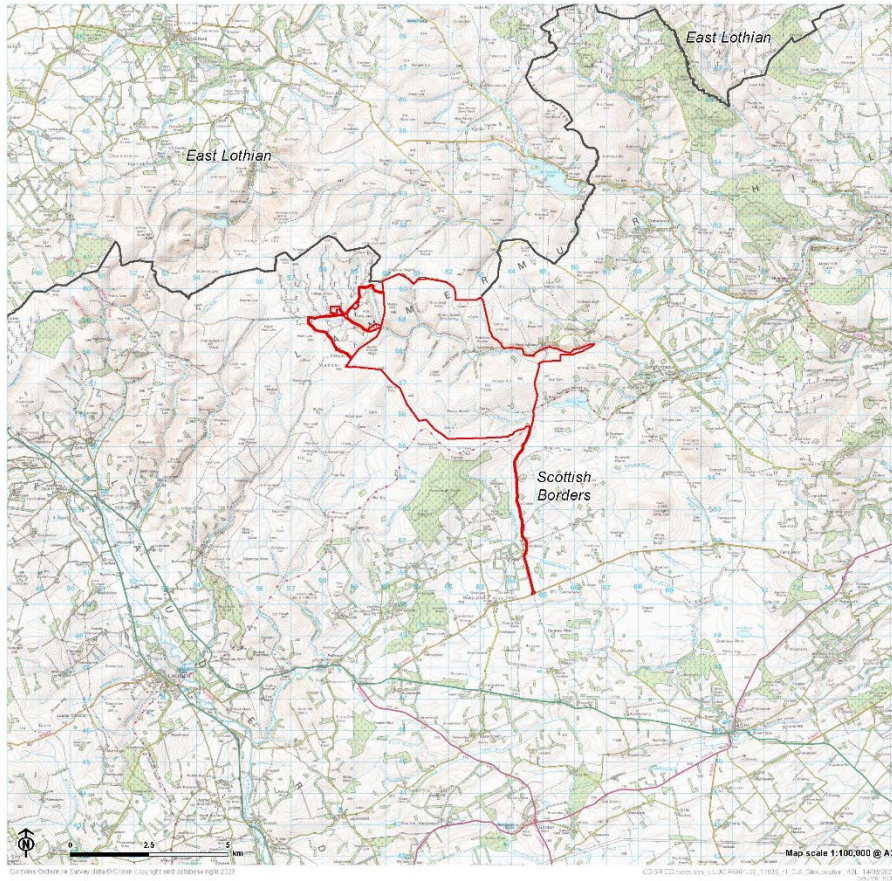
¹ SBC will not be the determining authority, but its inputs will be key to the decision making process.

² Formerly known as Scottish Natural Heritage (SNH)

1.14 Fallago Rig Wind Farm, which is operated by EDF Renewables, is located adjacent to the Proposed Development in the Scottish Borders. The existing Fallago Rig Wind Farm comprises 41 turbines at 125 m maximum blade tip height, and seven turbines at 110 m maximum blade tip height and is located immediately to the north-west of the Site boundary. Fallago Rig Wind Farm became operational in July 2013.

1.15 Access to the Site will follow that used for Fallago Rig Wind Farm, with access taken from the B6456 to the east of Westruther then by means of a short section of minor road to Wedderlie and then following the wind farm track north for approximately 6 km to the Dye Water valley.

1.16 There are several recreational routes present within and in close proximity to the Site. The Southern Upland Way (SUW) joins with the existing Fallago Rig access track for approximately 700 m then continues outside of the Site boundary. Several heritage paths also run alongside existing tracks within the site, one of which is the Herring Road Path. Other recreational paths run along the main existing Fallago Rig access track into the Site from the B6456 towards Dunside Cottage and across the River Dye. Public Rights of Ways (PRoW) follow the existing Fallago Rig access track from the B6456 and through the Site to Fallago Rig, stopping short of the existing substation. For more details on the recreational routes please see **Appendix 3.3: Outline Outdoor Access Management Plan** of the EIA Report.



Dunside Wind Farm
for EDF Renewables



Figure 1: Site Location

Site Boundary
 Local Authority boundary

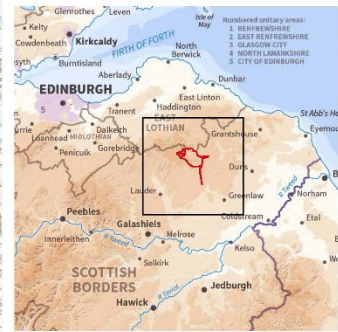


Figure 1: Site Location

2. Development Description

The Proposed Development

2.1 The main components of the Proposed Development will comprise the following:

- Up to 15 wind turbines, each with a maximum blade tip height of 220 m (with an external transformer kiosk);
- Crane Hardstandings adjacent to each turbine position;
- Four new watercourse crossings (including two upgraded existing crossings) and associated infrastructure;
- Approximately 15 km of proposed wind farm tracks and approximately 1.1 km of proposed light vehicle track;
- Use of approximately 17.5 km of existing access tracks (with localised areas of widening/upgrading);
- Onsite underground electrical cables connecting to Fallago Rig substation;
- Control building and extension to Fallago Rig substation; and
- A 20 MW battery for electricity storage.

2.2 In addition to the above operational features of the Proposed Development, its construction will also require the following temporary components:

- Four construction compounds (two existing compounds which will remain in place following completion of construction of the Proposed Development, and two proposed which will be restored following construction), including laydown area(s) and car parking; and
- Up to three temporary borrow pits which will be closed and reinstated following completion of construction.

2.3 **Figure 2** shows the layout of the Proposed Development including the key components noted above

Access

2.4 Access to the Site will use the existing access created and maintained for Fallago Rig Wind Farm (with localised upgrades/widening proposed where required), with access taken from the B6456 to the east of Westruther, then by means of a short section of minor road to Wedderlie and then following the wind farm track north for approximately 6 km to the Dye Water valley. Access from the port of entry (currently assumed to be Rosyth) will be undertaken via the M90, A720, A68 and A697 joining the B6456 near Hyndsidehill. This will be used primarily for the delivery of wind turbine components, general construction traffic and Site access for construction workers. This arrangement was chosen to minimise disruption, maximise safety and help facilitate delivery. It is the route used for the delivery of turbines at Fallago Rig Wind Farm.

Aviation Lighting

2.5 In the interest of aviation safety and in accordance with aviation legislation/policy, seven turbines will be fitted with visible red lights and all 15 turbines will be fitted with infra-red hub mounted obstruction lighting. Infrared lighting allows military aircraft fitted with a range of Night Vision Devices (NVDs) to detect and avoid the Proposed Development. Infrared lighting cannot be seen by the naked eye.

Lifespan of the Proposed Development

2.6 Subject to the granting of the consent, it is anticipated that the construction of the Proposed Development will last for approximately 19 months, commencing in 2026. Consent is being requested to operate the Proposed Development for 35 years.

2.7 At the end of the 35-year operational period, the Proposed Development may be fully decommissioned, or an application may be made to extend its operational life. Decommissioning would involve the following activities:

- Dismantling and removal of wind turbines and electrical equipment;
- Restoration of the turbine areas, hardstandings and new tracks; and
- demolition and removal of the substation and battery storage compounds.

2.8 Turbine components and electrical equipment will be dismantled and removed in a similar fashion to their delivery and erection. The turbines will be split into sections which will then be transported from the Site by HGVs unless they can be recommissioned elsewhere, in which case, they may be removed in the same manner as their delivery. Turbine components will be cut up offsite in controlled environments ready for reuse or recycling or appropriate disposal. EDF Renewables has adopted a no-landfill policy for turbine blades in all countries in which it operates.

2.9 Some of the access tracks could be left onsite to ensure the continued benefit of improved site access for the landowner, or they could be reinstated. It is not currently usual to fully remove concrete foundations as buried foundations are environmentally benign whilst excavating and disposing of them offsite will be more harmful. The exposed concrete plinth from turbine foundations will typically be removed to a depth of 1 m below the surface and the entire foundation will be graded over with soil and replanted / restored as appropriate.

Embedded Mitigation Measures

2.10 Embedded mitigation measures, comprising general good practice measures, will be employed as standard techniques during the construction of the Proposed Development. Therefore, these measures are considered to be an integral part of the design and implementation of the construction phase.

2.11 These measures include:

- Operating under a Construction and Environmental Management Plan (CEMP);
- Adopting a Construction Traffic Management Plan (CTMP); and
- A Peat Management Plan.

2.12 Embedded mitigation can also include measures adopted as part of the design of the Proposed Development to avoid the potential for significant effects on specific receptors. For example, where possible, a 50 m buffer has been applied to all watercourses (i.e., the receptor) as embedded mitigation to minimise the potential for run-off and pollution to affect water quality. Where relevant, embedded mitigation measures, including those incorporated through the design process, are mentioned in the topic summaries.

Peat Management

2.13 Whilst the Proposed Development has been designed to minimise disturbance to peatland, it has not been possible to avoid areas of peat entirely. Consequently, a Peat Management Plan (Outline PMP) has been produced which will ensure that excavated peat is appropriately managed and re-used onsite. It is anticipated that all excavated peat can be reused within the Site.

2.14 An Outline PMP is included in **Appendix 8.3: Peat Management Plan** of the EIA Report. This provides detail on the indicative volumes for peat excavation and outlines recommendations for the handling, re-use, and storage of peat during construction of the Proposed Development. Prior to construction, the Outline PMP will be updated with information obtained during the detailed ground investigations and detailed design stage of the Proposed Development.

Benefits of the Proposed Development

Environmental Benefits

Carbon Balance

2.15 The purpose of the Proposed Development is to generate electricity from a renewable source of energy, offsetting the need for power generation from the combustion of fossil fuels. The Proposed Development will also potentially contribute to the decarbonisation of heat and transport networks and ultimately contribute towards Scotland's net zero obligations. Consequently, the electricity that will be produced by the Proposed Development will result in a saving in emissions of carbon dioxide (CO₂) with associated environmental benefits.

2.16 It is calculated that the CO₂ emissions that will be emitted as part of the construction of the Proposed

Development will be paid back within 22 months (1.8 years). Following this period, the Proposed Development will, in effect, be in a net gain situation and will contribute to national objectives to reduce carbon emissions.

Habitat Management

2.17 An Outline Restoration and Enhancement Plan (OREP) is presented within **Appendix 6.6** of the EIA Report. The OREP provides details of indicative proposals to provide biodiversity/habitat enhancements within the Site. The OREP will be developed through consultation with key stakeholders, further research, and will culminate in a more formal REP to be implemented and monitored during the lifetime of the Proposed Development.

2.18 In summary, the current OREP proposals include the following measures:

- Non – Peatland Habitat Enhancement:
 - Riparian shrub/ woodland planting of key river corridors;
 - Species Rich Grassland introduction to improve biodiversity; and
 - Native Shrub Regeneration.
- Peatland Related Habitat Enhancement:
 - Re-wetted areas to enhance bog and heath habitat;
 - Alternative approaches to heather management; and
 - Heathland habitat improvement.
- Habitat improvement for wader species.

Community Benefits

2.19 It is estimated that the Proposed Development could power over 62,000 homes per year, based on a 7.2 MW turbine³.

2.20 As well as contributions to the generation of low carbon electricity and the resulting offsetting of carbon emissions, the Proposed Development also provides the opportunity for local communities to benefit financially from its operation through the creation of a community benefit fund estimated to be £540,000 per year (based on 15 x 7.2 MW turbines and £5,000 per MW as recommended by the Scottish Government).

2.21 The Applicant recognises the opportunities and benefits that arise from community ownership in energy projects and are committed to working with local communities to develop suitable community investment opportunities if there is interest in taking this forward.

³ Load factors based on the five year rolling averages on unchanged configuration basis using Table 6.5 of 'Digest of UK Energy Statistics' -

latest figures as per July 2022 release. Digest of UK Energy Statistics (DUKES): renewable sources of energy - GOV.UK (www.gov.uk)

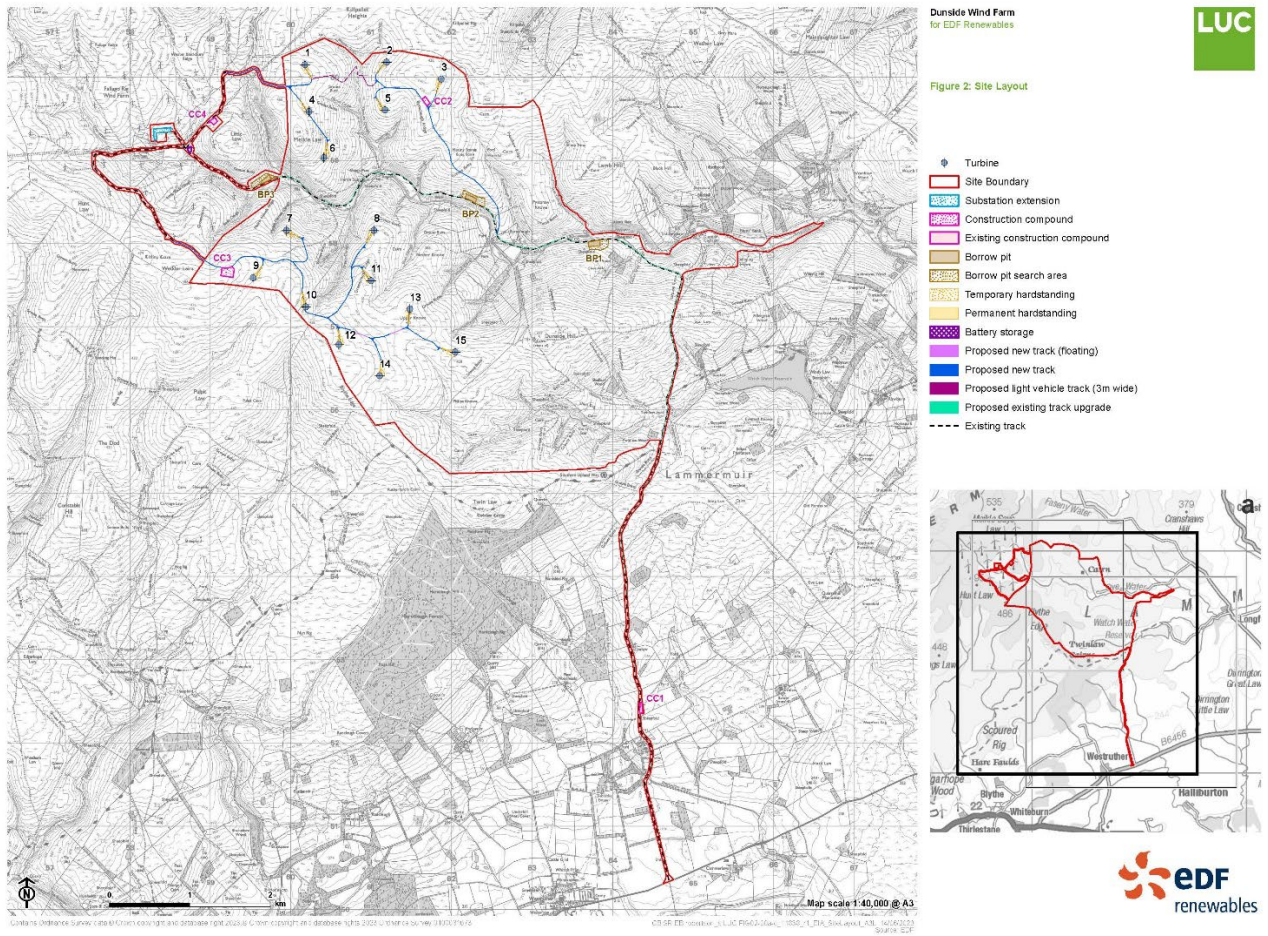


Figure 2: Site Layout

3. Site Selection and Design Strategy

Site Selection

3.1 The Site was selected by the Applicant for a number of reasons, including the following:

- The Site has an excellent wind resource.
- The size of the Site allows for good opportunities to explore and provide habitat management and enhancement.
- There are no environmental constraints which cannot be directly avoided through careful design, however the presence of the Site within a locally designated landscape (Lammermuir Hills Special Landscape Area (SLA) formed a key consideration in the design process, as detailed below.
- Existing land use and the adjacent land (Fallago Rig Wind Farm) is compatible with the development of a renewable energy scheme.
- There is good access to the Site from the B6456 public road for construction traffic and turbine deliveries, using existing infrastructure such as the existing Fallago Rig Wind Farm access tracks, reducing the need for new tracks, and the benefit of less habitat loss.
- The Site is at distance from main settlements, with the closest being the village of Westruther approximately 6 km to the south of the nearest proposed turbine.
- The distances from the nearest properties are such that noise limits and residential visual amenity threshold impacts can be avoided.
- There is a feasible local electricity grid connection available.

Design Process

3.2 The final design of the Proposed Development (see **Figure 2**) is the outcome of an iterative process which has aimed to balance maximising electricity production whilst minimising potential effects on the environment.

3.3 The design strategy was, importantly, influenced by landscape and visual considerations including landform, scale, land use (including cumulative wind farm context, notably Fallago Rig Wind Farm) and key visual receptors. These factors influence how the Proposed Development will be perceived by people within the surrounding area, and to what extent the landscape is capable of accommodating the Proposed Development. Achieving an optimal balance between renewable energy generation and effects upon cultural heritage assets was also a key consideration, together with achieving acceptable noise emissions and minimising effects on ecological and hydrological receptors and the Site's peat resource to the greatest feasible extent. The design strategy

also comprised a number of design objectives which are set out below. The design of the Proposed Development has drawn upon the guidance contained within NatureScot's Siting and Designing Wind Farms in the Landscape⁴.

3.4 The layout of the Proposed Development evolved through a number of design iterations. The layout iterations took into account emerging survey findings, as well as the feedback received following consultation with the consultees and public to avoid or minimise likely significant environmental effects.

3.5 The main components of the Proposed Development considered in the initial design iterations were the turbines. The location of other infrastructure components was largely dictated by the positioning of the turbines, and were designed around onsite environmental constraints including:

- Ecology: Avoidance of sensitive habitats; observing appropriate separation distances with respect to protected species and associated habitat features (including bats, otters and mountain hare, watercourses and key habitat features).
- Residential Properties: Maintaining a buffer around residential properties and considering views in detail to minimise significant effects relating to residential visual amenity, noise and shadow flicker.
- Cultural Heritage: Avoiding designated cultural heritage assets within the Site which are considered to be nationally important including Scheduled Monuments (in particular, the Mutiny Stones), and any known non-designated heritage assets within the Site.
- Hydrogeology and Peat: Maintaining a 50 m buffer where possible from watercourses, designing site infrastructure to minimise the number of new watercourse crossings. Avoiding construction in areas identified as likely Groundwater Dependent Terrestrial Ecosystems (GWDTEs) as well as areas of peat (>1 m) where possible.
- Topography: Avoiding steeper slopes where feasible to ensure constructability and minimising the need for significant cut and fill engineering works.
- Recreation: Turbines were removed from the initial layout to improve separation distance and views from the Southern Upland Way and Twin Law Cairns. Temporary segregated footpaths for recreational users of the Southern Upland Way and Herring Road footpaths have been proposed during the construction period.

3.6 Further details can be found in **Chapter 2: Site Selection and Design Strategy** of the EIA Report and the **Design and Access Statement**.

⁴ Scottish Natural Heritage, 2017, Siting and Designing Windfarms in the Landscape (Version 3a)

4. Landscape and Visual Impact Assessment

Introduction

4.1 The Landscape and Visual Impact Assessment (LVIA) considered the potential effects of the Proposed Development on landscape and views of the Proposed Development from key viewpoints, surrounding routes and settlements, in accordance with best practice guidance. The cumulative landscape and visual impact assessment included consideration of operational and under construction developments as well as those which are consented and at application stage. It was considered appropriate to include Newlands Hill Wind Farm in the cumulative assessment given that, although at Scoping stage, the design of this wind farm has been finalised and sufficient information was available to carry out an assessment.

4.2 To support the assessment of the effects of the Proposed Development on landscape and visual amenity, 24 viewpoints within the 45 km Study Area were selected and agreed via consultation with ELC and NatureScot⁵. These viewpoints were selected to represent the maximum visibility of the Proposed Development from different viewing directions and distances. To show what the Proposed Development is likely to look like from these viewpoints, photomontage visualisations and wirelines have been provided. To assess the visual effects of night-time aviation lighting, 'dusk' photomontages were prepared for three viewpoints: Viewpoint 3 Minor Road near Wanside Rig Junction, Viewpoint 7 B6456 near Westruther, and Viewpoint 12 Minor Road near Hen Law. These are representative of the locations from which residential receptors and road users are likely to see the aviation lights at night.

Overview of Methodology

4.3 The method for assessment included field survey, computer modelling, creation of Zone of Theoretical Visibility (ZTV) maps, GIS mapping and photography.

4.4 Landscape and visual considerations, and the composition of the layout in key views (e.g. from Twin Law Cairns on the Southern Upland Way and Westruther), played a key role in the iterative development of the layout design.

Baseline Conditions

4.5 The Site is located within the Dissected Plateau Moorland Landscape Character Type (LCT), which is characterised by its level-topped hills and ridges, grandeur of scale and sense of wildness. The Site is within the locally designated Lammermuir Hills SLA, which is coincident with the Lammermuir Moorland SLA to the north of the Site. Beyond 15 km from the Site, designated landscapes with theoretical visibility of the Proposed Development include the Eildon Hills National Scenic Area (NSA).

4.6 There are a number of small settlements within 15 km of the Proposed Development, and those with theoretical

visibility of the Proposed Development include Westruther, Longformacus, Lauder, Gordon and Nether Blainslie.

4.7 The Southern Upland Way passes to the south of the Site and through the Site at the access track.

Assessment of Effects

Landscape

4.8 **Major** and Significant landscape effects will occur for the Site during the construction of the Proposed Development due to ground disturbance, the presence of tall cranes and the movement of plant and machinery. During operation, effects are likely to continue due to the introduction of the turbines as tall structures in the landscape.

4.9 In terms of LCTs, **Major** and Significant effects are predicted for LCT 90: Dissected Moorland Plateau, within the Site, reducing to Moderate and Significant within up to 5 km of the Site. Moderate and Significant effects are predicted for LCT 105 - Upland Fringe Moorland with Hills and LCT 266 – Plateau Moorland – Lothians, within 7 km and 5 km of the Site, respectively. Beyond this, effects on these LCTs will Not be Significant.

Visual

4.10 Significant effects on views are predicted at nine of the 24 representative viewpoints. Major and Significant effects are predicted at Viewpoint 1: Twin Law Cairns, and Viewpoint 2: Nunn Rig. Moderate and Significant effects are predicted at Viewpoint 3: Minor road near Wanside Rig junction, Viewpoint 4: Watch Water Reservoir, Southern Upland Way, Viewpoint 5: Minor road near Wrunk Law, Viewpoint 6: Spartleton Hill, Viewpoint 8: B6456 near Bedshiel, Viewpoint 9: Derrington Great Law, and Viewpoint 11: Edgarhope Wood, Southern Upland Way.

4.11 Residents within settlements including Westruther and Longformacus are not expected to experience significant effects. People using the Southern Upland Way are expected to experience Significant effects within around 5 km of the Proposed Development, which reduces to Not Significant beyond 5 km.

Cumulative

4.12 The cumulative assessment contained within the LVIA focuses on the additional cumulative change which may result from the introduction of the Proposed Development. Cumulative landscape and visual effects are most likely to arise when the Proposed Development is considered in addition to Newlands Hill, which is at Scoping stage and located around 4 km to the north of the Proposed Development.

⁵ SBC was also consulted but no response was received.

Aviation Lighting

4.13 No Significant effects on landscape character or designated landscapes are anticipated as a result of aviation lighting. In terms of visual effects, Significant visual effects are predicted for one assessment viewpoint at night.

Residential Visual Amenity

4.14 A Residential Visual Amenity Assessment (RVAA) has been undertaken from seven properties located closest to the Proposed Development. Although people at five properties assessed in the RVAA have the potential to experience a Significant visual effect, none of these will be subject to effects on residential visual amenity which are judged to breach the Residential Visual Amenity Threshold described in guidance provided by the Landscape Institute⁶, where the effect would appear overwhelming or oppressive.

Mitigation Proposed

4.15 Measures to minimise effects upon the landscape resource and visual amenity were mainly achieved through the design of the Proposed Development (embedded mitigation). The appearance of the Proposed Development in views from nearby properties, settlements and hills formed a key consideration in the design development.

4.16 A reduced lighting scheme has been designed and agreed with the Civil Aviation Authority (CAA). The lights will be controlled such that when the meteorological visibility is greater than 5 km from the points of measurement on the turbine hubs, the lights will be reduced to 200 cd (10% of normal power). The required design of the lights is also such that the brightness reduces in intensity when seen from above and below the horizontal, resulting in a reduction in brightness being experienced for the lower-lying and closer receptors.

Residual Effects

4.17 As all mitigation for landscape and visual effects is embedded within the final design for the Proposed Development, all effects summarised in the LVIA are effectively residual effects as no additional mitigation is proposed.

⁶ Landscape Institute (2019) Residential Visual Amenity Assessment Technical Guidance Note 2/19 (TGN 2/19)

5. Cultural Heritage

Introduction

5.1 The cultural heritage assessment has considered the potential physical and setting effects on cultural heritage assets during construction and operation of the Proposed Development (including cumulatively). Heritage assets are defined as a physical element of the historic environment and can be a building, monument, site, place, area or landscape identified as having cultural significance. Heritage assets may have statutory or non-statutory designations, including scheduled monuments, listed buildings, conservation areas and gardens and designed landscapes.

Overview of Methodology

5.2 The assessment was conducted in line with heritage protection legislation and the requirements of National Planning Framework 4 and informed by relevant technical and professional guidance.

5.3 The information underpinning the assessment was gathered from Historic Environment Scotland databases, the SBC and East Lothian Council historic environment records (HER), archival and published sources, recent and historical aerial photography, and field survey of the Site and surrounding area.

5.4 A range of measures were built into the design of the Proposed Development to aid in the avoidance and minimisation of effects to heritage assets – both physical and due to change in their setting.

Baseline Conditions

5.5 Five designated heritage assets (four scheduled monuments and one category C listed building) as well as 69 non-designated heritage assets have been identified within the Site. Evidence of historic land use of the moorland and hilltops within the Site comprised grazing and later sporting activities. This, in combination with the exposed and peat-covered environment suggests there is a low potential for previously unrecorded heritage assets, including buried archaeological remains, within the Site above 350 m AOD (Above Ordnance Datum). There is greater potential for previously unrecorded buried archaeological remains below this level, particularly adjacent to watercourses and along the lower slopes of the Dye Water and Watch Water.

5.6 Heritage assets within the setting study areas are characterised by evidence of prehistoric activity from the Neolithic to the Iron Age, including Neolithic and Bronze Age funerary and ritual monuments, late prehistoric settlements, including interrelated groups of Iron Age hillforts, promontory forts and defined enclosures. Also included in the historic environment baseline are the remains of pre-Improvement farmsteads and townships, post-medieval buildings, some of which are listed buildings, and gardens and designed landscapes associated with the houses of county estates.

Assessment of Effects

5.7 No significant effects resulting from direct physical effects on heritage assets during construction have been identified.

5.8 A number of designated heritage assets will experience setting change as a result of the operation of the Proposed Development. These changes have the potential to affect the contribution of their setting to how they are understood, appreciated and experienced in the landscape. The elements of their setting that contribute most to their cultural significance and the evidential and historical value of their physical remains will not be affected.

5.9 Potential direct effects resulting from setting change have been identified for five designated heritage assets of high importance, comprising four scheduled monuments and one listed building. Changes to the setting of the Mutiny Stones, Long Cairn (SM361) and Byrecleugh Farmstead (SM4549) will affect the way elements of their settings contribute to how they are appreciated and experienced in the landscape. This is assessed as leading to a **Moderate** and **Significant** effect in EIA terms. The presence of the Proposed Development during operation may slightly affect the way the settings of a further two scheduled monuments and one category C listed building are experienced in the landscape, which could lead to a **Minor** and not **Significant** Effect.

5.10 No cumulative effects to heritage assets are anticipated.

Mitigation Proposed

5.11 The design process has sought to minimise the potential for impacts on heritage assets resulting from setting change. This has included a reduction in the number of turbines and their re-siting through the design process.

5.12 For developments of this sort, it is difficult to fully mitigate impacts to heritage assets resulting from setting change during operation beyond those changes to the design and layout identified as the Proposed Development evolves. Therefore, no specific additional mitigation to reduce the potential significant effects to Mutiny Stones, Long Cairn (SM361) and Byrecleugh Farmstead (SM4549) due to setting change have been identified.

Residual Effects

5.13 The residual effects on the setting of these designated heritage assets are therefore **Moderate** and **Significant**.

Introduction

6.1 This chapter summarises the ecological baseline conditions recorded within and around the Site in relation to sites designated for nature conservation purposes, habitats and protected species (not including bird species). It also summarises the findings of the assessment of likely significant effects on these features, associated with the construction, operation and decommissioning of the Proposed Development.

Overview of Methodology

6.2 The ecology assessment followed the relevant guidance, legislation and policy as detailed in the Scoping Report.

Baseline Conditions

6.3 A suite of studies were undertaken to establish baseline ecological conditions, these included: a desk study, habitat/vegetation field surveys and protected species field surveys. Field surveys were conducted between April and September 2022 in line with best practice guidelines.

6.4 The desk study identified one statutory designated site and three non-statutory sites within or immediately adjacent to the Site. The potential effects on these designations as a result of construction of the Proposed Development were assessed in detail.

- River Tweed Special Area of Conservation (SAC)/ Special Site of Scientific interest (SSSI). The Dye Water, located in the northern edge of the designation, rises to the west of the Site and flows through its centre. The Dye Water is a tributary of the Whiteadder Water, which is a tributary of the Tweed. The Dye Water flows for approximately 5.5 km through the Site, however only 3 km of the watercourse is designated, representing 0.002 % of the SAC's total c.1285 km length. The Proposed Development's access track, which utilises existing wind farm tracks (for Fallago Rig wind farm), also crosses the Blackadder Water, a tributary of the River Tweed, which rises to the south of the Proposed Development, in the Harecleugh Forest. The River Tweed SAC is designated for:
 - Watercourses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation.

6.5 Atlantic salmon, otter, sea lamprey, brook lamprey and river lamprey.

- Byrecluech Burn, Stot Cleugh Local Biodiversity Site (LBS) is designated for cleughs and burnside with nationally scarce plants and locally rare plants and moths.
- Corby Scar and Upper Watch Water LBS is designated for acid burnside with a high diversity of grassland plant species, including several local rarities.

- The Watch Water LBS was located immediately adjacent to the Site, this is designated for its burnside, rocky banks with a high diversity of grassland plants, locally rare plants and moths.

6.6 Habitats within the Site were dominated by managed moorland/ dry dwarf shrub heath strips with mosaics of acid/ marshy grassland, improved grassland, modified heath and modified bog with localised broad-leaved woodland and conifer plantation. The following habitats of conservation concern were recorded within the Site and were assessed in detail:

- Four Annex 1 habitats: H4030 European dry heaths; H7130 Blanket bogs; H4010 Northern Atlantic wet heaths with *Erica tetralix* and H7220 Hard-water springs depositing lime.
- Six Scottish Biodiversity/LBAP List habitats: Upland Heathland; Blanket Bogs; Upland Flushes, Fens and Swamps; Upland birchwoods; Marshy grassland and Rivers.
- Six potential Ground Water Dependent Ecosystem communities.

6.7 The habitats onsite supported low levels of the following protected species: Badger, otter, and mountain hare and bat species (common pipistrelle, soprano pipistrelle, brown long-eared bat, Daubenton's bat, Leisler's bat and noctule bats). The potential effects of construction and operation of the Site were assessed for these features.

Assessment of Effects

6.8 The ecological assessment considered the likely effects of construction, operation and decommissioning of the Proposed Development on the following features:

6.9 Construction effects as a result of:

- Habitat loss and fragmentation disturbance and mortality on statutory and non-statutory designated sites within the Site:
 - Habitat loss and fragmentation of habitats of conservation concern.
 - Habitat fragmentation disturbance and mortality of otter.
 - Habitat loss and mortality of mountain hare.
- Operational effects on:
 - Habitat fragmentation and mortality of bats.
- Cumulative/in-combination effects of the Proposed Development in combination with other developments.

6.10 No Significant Effects were identified, within the context of the EIA regulations definitions. Furthermore, within the context of a Habitat Regulations Assessment, no adverse effects on the integrity of the River Tweed SAC were identified.

Mitigation Proposed

6.11 During the design phase of the project a series of design assumptions, good practice measures and embedded design actions were taken to avoid ecologically sensitive features.

6.12 The Proposed Development was subsequently not predicted to have any significant effects, within the definitions defined in the EIA regulations, thus no mitigation was required. Notwithstanding this, a series of measures have been identified to ensure legal compliance is achieved during construction, operation and decommissioning.

6.13 An Outline Restoration and Enhancement Plan (OREP, **Appendix 6.6**) has been prepared and sets out a series of objectives which will deliver biodiversity enhancements within the Site, including the restoration of degraded peatland habitats and the creation of new riparian woodland.

Residual Effects

6.14 The residual effects are considered to be Not Significant within the context of the EIA Regulations.

Introduction

7.1 The ornithology assessment has considered the baseline ornithological conditions recorded within and around the Site and presents an assessment of the potential for significant effects on ornithological features associated with the construction, operation and decommissioning of the Proposed Development.

7.2 Information has also been provided to enable the competent authority to conclude whether any likely significant effects on a European site may occur under the terms of the Habitats Regulations, and if so, whether the proposals would have an adverse effect on the site's integrity.

Overview of Methodology

7.3 The ornithology assessment followed the relevant guidance, legislation and policy as detailed in the Scoping Report.

Baseline Conditions

7.4 Baseline surveys recorded the following key species: barn owl, golden eagle, goshawk, hen harrier, marsh harrier, merlin, osprey, peregrine falcon, red kite, short-eared owl, white-tailed eagle, curlew, golden plover, lapwing, ringed plover, wood sandpiper, pink-footed goose, greylag goose, barnacle goose, whooper swan and herring gull. On the basis of these species' presence, Nature Conservation Importance (NCI) and conservation status, curlew, golden plover, lapwing, golden eagle and short-eared owl were identified to be Important Ornithological Features (IOFs) and were included in the assessment.

7.5 Three Special Protection Areas (SPAs) were identified to be within 20 km of the Proposed Development (Greenlaw Moor SPA, Fala Flow SPA and Firth of Forth SPA) and it was established that there was potential for a likely significant effect to the pink-footed goose populations associated with these SPAs. Information to inform an appropriate assessment was provided within the chapter and **Appendix 7.3: Shadow Habitat Regulations Appraisal**.

Assessment of Effects

7.6 The following effects were considered for the Proposed Development alone and cumulatively with other wind farms for each of the IOFs:

- Construction and decommissioning: disturbance/displacement and direct habitat loss.
- Operation: disturbance/displacement, collision risk and lighting (both disturbance/displacement and attraction).

7.7 The assessment concluded the following predicted effects for each of the IOFs:

- Construction/decommissioning: No Significant Effects were predicted for curlew, golden plover, lapwing, short-eared owl or golden eagle.

- Operational displacement: a potentially significant effect was predicted for curlew. No Significant Effects were predicted for golden plover, lapwing, short-eared owl or golden eagle.
- Operational collision risk: No Significant Effects were predicted for curlew, golden plover, lapwing, short-eared owl or golden eagle.
- Operational lighting: No Significant Effects were predicted for curlew, golden plover, lapwing, short-eared owl or golden eagle.
- Cumulative: curlew were also considered in the context of cumulative operational displacement and No Significant Effects were predicted.

7.8 In the context of the Habitats Regulations Appraisal (HRA), no adverse effects on the integrity of the Greenlaw Moors SPA, Fala Flow SPA or Firth of Forth SPA were predicted.

Mitigation Proposed

7.9 As No Significant Effects were predicted during construction, no specific mitigation in addition to the embedded construction mitigation (Bird Disturbance Management Plan, pre-construction surveys and the presence of an Ecological Clerk of Works (ECoW)) was proposed. Similar embedded mitigation to that outlined during the construction phase will be undertaken during the decommissioning.

7.10 Potentially Significant Effects during operation were identified for curlew (displacement). Curlew were identified as a key ornithological feature in the Outline Restoration and Enhancement Plan (OREP, **Appendix 6.6**) with objectives 2, 4 and 5 specifically identified to deliver focussed habitat enhancement to maintain and increase the breeding curlew population. It should be noted that these objectives will also be of benefit to other breeding waders (including lapwing and golden plover).

Residual Effects

7.11 The residual effects are considered to be Not Significant within the context of the EIA Regulations.

8. Hydrology, Hydrogeology, Geology & Peat

Introduction

8.1 This chapter considers the potential effects of the Proposed Development on hydrology, hydrogeology, geology and peat. It details the baseline environmental conditions, based on desk studies and a comprehensive field survey conducted from March 2022 to May 2023.

Overview of Methodology

8.2 The assessment was undertaken using the findings of field survey, consultation and desk-based data collection. Phase 1 and 2 peat surveys were undertaken based on Scottish Government (2017⁷) guidance, along with hydrological surveys, Ground Water Dependent Terrestrial Ecosystem (GWDTE) surveys and a watercourse crossing assessment.

8.3 Many mitigation measures are embedded into project design (e.g. avoidance of deeper peat, 50m buffers from watercourses, buffers from GWDTEs and the use of Sustainable Drainage Systems (SuDS) for treatment of water and slowing the rate of surface water runoff). Also avoidance of new watercourse crossings by using existing tracks where available and minimising new crossings. If new crossings cannot be avoided, environmental sensitive bridge design (e.g. bottomless arched culverts) will be used.

8.4 These embedded measures were considered to be in place for the assessment of effects.

Baseline Conditions

8.5 Most of the Proposed Development is located within the Dye Water catchment in the Scottish Borders. The Dye Water is a tributary of the Whiteadder Water. Small parts of the Proposed Development are located within the Watch Water, Wester Burn and Blackadder Water catchments. All watercourses within and downstream of the Site are within the wider River Tweed catchment.

8.6 The Dye Water and Blackadder Water within the Site are designated within the River Tweed Special Area of Conservation (SAC) as are all the watercourses downstream of the Site. The River Tweed SAC is designated for biological reasons, including Annex 1 habitats (watercourses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation) and species (Atlantic Salmon, Sea Lamprey, River Lamprey, Brook Lamprey and Otter).

8.7 SEPA flood maps indicate that flood extents within the Site are constrained along the banks of the Dye Water, including close to the access track. There is no proposed infrastructure within the predicted fluvial floodplain extent and flooding is not considered an issue within or close to the Site.

8.8 The Site falls within a drinking water catchment where a Scottish Water abstraction is located. There are abstractions

from the Dye Water and the Watch Water which supply the Rawburn Water Treatment Works (WTW).

8.9 There is one Private Water Supply (PWS) within the Site and 11 PWS within 1 km of the Site boundary. There are two groundwater abstractions associated with the existing Fallago Rig wind farm that are within the 100 m and 250 m buffers from the Proposed Development.

8.10 The NatureScot (2016) Carbon and Peatlands Map indicates that carbon-rich soils and deep peat, are present within the Site, including Class 5 peatlands on large parts of the upland areas within the Site. There are no priority peatlands (Class 1 and 2) within or close to the Site.

8.11 Over 3,080 peat depths probes were collected during Phase 1 and Phase 2 peat surveys. Approximately 38 % of probed locations had depths <0.25 m and ~43 % had depths between 0.25 and 0.5 m; these locations comprise organic soil and not peat. Of the remaining 19 % of locations, ~16 % recorded depths between 0.5 and 1.0 m and the remainder > 1.0 m. The deepest peat onsite was 3.8 m and was recorded close to the northern boundary of the Site. Most of the peat onsite has been modified by extensive burning, grazing and localised drainage, with extensive cover of heather and rarity of *Sphagnum*.

8.12 The majority of the Site is underlain by highly indurated sedimentary greywackes (Gala Group Wacke), which are classified as having low aquifer productivities.

8.13 Areas of potential Groundwater Dependant Terrestrial Ecosystems (GWDTEs) were identified during the ecology NVC surveys and are described in **Chapter 6: Ecology**. A subsequent walkover survey of potential GWDTEs was undertaken by hydrologists and used to inform the GWDTE assessment.

Assessment of Effects

8.14 The main environmental effects are predicted to occur during construction. The activities that will occur during construction that may have an impact on the water environment and peat, include site clearance; use of heavy plant machinery; increase of hardstanding areas; construction and upgrading of access tracks; watercourse crossings; associated earthworks/excavation/re-profiling and construction traffic on access tracks.

8.15 The Proposed Development requires 19 existing watercourse crossings and four new crossings, two of which are upgrades to existing informal track crossings. Details of all watercourse crossings (existing and proposed) are provided in **Appendix 8.1: Watercourse Crossings**.

8.16 With embedded mitigation measures, including following good practice construction and site drainage management guidance from relevant bodies (e.g. SEPA, CIRIA, Scottish

⁷ Scottish Government, Scottish Natural Heritage & SEPA (2017) Peatland Survey - Guidance on Developments on Peatland.

Renewables), the magnitude of the effect on water quality is considered to be negligible and of short duration. The sensitivity of all downstream receptors is high, with respect to water quality, and the significance of the effect is minor.

8.17 There are no PWS sources or properties within the recommended buffers from the Proposed Development and based on analysis of surface water catchments, ground elevations of PWS compared to infrastructure, and distances from infrastructure there is considered to be no effects on PWS as a result of the Proposed Development.

8.18 The magnitude of effect on the existing Fallago Rig groundwater abstractions is considered to be slight, as the works could potentially render the water supply unusable for a temporary period during the construction works. An alternative supply (borders or use of abstractions from the Dye Water) will be put in place during the construction works, if required. Given the medium sensitivity of the groundwater, the significance of the effect is considered to be minor.

8.19 The effect of site clearance and construction on run-off rates and flood risk is considered to be of negligible magnitude and the significance is none on watercourses and waterbodies downstream of the Proposed Development during construction.

8.20 Based on the results of the GWDTE surveys, a number of adjustments were made to the turbine and track locations to consider the presence of moderate and highly dependent GWDTE. Where practical, the 250m buffer has been avoided for siting turbines and borrow pits, and 100m buffer has been avoided for siting roads, tracks and trenches, as per SEPA guidance⁸. However, there are two areas where infrastructure is proposed within the recommended buffers. These are assessed in detail in **Appendix 8.6: GWDTE**, based on hydrological setting and flow path analysis. The effect on the GWDTEs was considered to be of none to minor significance during construction, however additional mitigation was proposed at one location.

8.21 The peat assessment, Peat Management Plan (Outline PMP) (Appendix 8.3) and Peat Landslide Hazard Risk Assessment (PLHRA) (**Appendix 8.4: Peat Landslide Hazard and Risk Assessment**) conclude that:

- Due to careful infrastructure placement, the majority of the peat deposits have been avoided by infrastructure.
- Based on calculations in the Outline PMP, a total of ~3,113 m³ of acrotelmic peat and ~3,235 m³ of catotelmic peat (6,348 m³ total) will be excavated during construction of the Proposed Development. Much of the material that is due to be excavated is thin organic soil (~60,494 m³), of which 27,986 m³ is due to be directly reinstated, with the remainder (~32,508 m³) to be used in tying in infrastructure in non-peatland areas. Of the excavated peat, 885 m³ of acrotelm and 847 m³ of

catotelm will be directly reinstated into temporary hardstandings, and the remainder, excavated primarily for construction of cut and fill tracks, will be used to tie the track margins into the wider peat areas.

- Based on the calculations described within the Outline PMP, there are sufficient opportunities to reuse peat across the site without generating a surplus. The effect on peat soils from excavation is therefore considered to be minor.
- The PLHRA indicates low likelihood of peat landslides across the Site, with only two moderate likelihood areas intersecting with proposed infrastructure. Runout analysis at these two locations (near Turbines 4 and 14) shows that potential landslide runout, if triggered by construction at the upslope source zones, would be likely to thin to negligible volumes prior to entry to Foul Cleugh and Kersons Cleugh (the two receptor watercourses). Therefore the significance of the effect of peat slides on the water quality of the connected Dye Water is considered to be neutral.
- Assuming embedded mitigation measures are incorporated into project design and are effective, the magnitude of the effect on peat is minor.

8.22 In terms of cumulative effects, assuming that nearby wind farm schemes (i.e., Wedderlie) are designed and constructed in line with NPF4 and national guidelines with respect to SuDS and GPPs, there will be no cumulative effect on the downstream catchments.

8.23 Cumulative effects on peat are not anticipated, given proposed restoration plans and avoidance/minimisation of peat.

Mitigation Proposed

8.24 With embedded mitigation measures incorporated into project design, there are no significant effects on hydrology, water quality, morphology, peat or PWS. Details of the embedded mitigation will be set out in detail prior to construction in a Pollution Prevention Plan (PPP) and Construction Environmental Management Plan (CEMP). The PPP will also contain details of the location specific additional mitigation for relevant infrastructure and the contractor will be legally obliged to comply with the pollution control and drainage measures agreed in the PPP.

8.25 Any excavated peat will be stored appropriately nearby and re-used as soon as possible for reinstatement purposes or tying in of infrastructure. Peat restoration described in **Appendix 6.6** will be undertaken primarily through drain blocking using established techniques rather than by using peat generated during wind farm construction.

⁸ SEPA: Land Use Planning System, SEPA Guidance Note 31 (LUPS-31): Guidance on Assessing the Impacts of Development

8.26 Further minimisation of peat landslide risk may be achieved through further micro-siting and / or careful construction management and through such mitigation, landslide risks are interpreted to be negligible post-mitigation.

8.27 Additional mitigation and SuDS (e.g., silt fences, settlement ponds) will be installed around some working areas, crossings and access tracks at sensitive locations (e.g. watercourse crossing and where the 50m buffer from watercourses could not be achieved) to reduce the risk of sediment/silt run-off to the water environment during construction. Additional mitigation and monitoring are proposed to minimise the effects on identified GWDTs.

8.28 Scottish Water services and pipework will be required to be taken account of during detailed design and prior to and during construction works, particularly relating to the pipework supplying water to the Rawburn WTW.

8.29 Safeguarding of the Fallago Rig groundwater abstractions and pipework and avoidance will be required during detailed substation design and during construction works. Monitoring of the abstraction will be undertaken before and during construction and an alternative water supply will be provided, if required.

8.30 An Environmental Clerk of Works (ECoW) will be present onsite during construction to monitor the works and check the mitigations outlined in the PPP and CEMP are followed.

Residual Effects

8.31 With mitigation and monitoring described above, the residual construction effects are either neutral or none. There are no residual operational effects on the water and soil environment.

Introduction

9.1 The noise and vibration assessment considered noise that will be emitted by equipment and vehicles used during construction of the Proposed Development and by the turbines during operation. The level of noise emitted by the sources and the distance from those sources to the receiver locations are the main factors determining levels of noise at receiver locations.

Overview of Methodology

9.2 Construction noise has been assessed by a desk-based study of the construction programme reflecting the Proposed Development being constructed using standard methods. Noise levels have been calculated for receiver locations closest to the areas of work and compared with guideline and baseline values.

9.3 Operational noise limits have been determined from data about the existing noise environment following the method set out in national planning guidance.

Baseline Conditions

9.4 The Proposed Development is located in an area of low population density, with a noise environment mainly characterised by natural, rural sources. The assessment has considered the residential properties nearest to the Site as these are considered 'noise-sensitive'. Surveys have been undertaken to establish existing baseline noise levels at a number of these properties.

Assessment of Effects

9.5 Construction noise, by its very nature, tends to be temporary and highly variable and therefore much less likely to cause adverse effects. Factors including the restriction of hours of working have been taken into consideration. It is concluded that noise generated through construction activities would have a minor impact.

9.6 Operational turbines emit noise from the rotating blades as they pass through the air. This noise can sometimes be described as having a regular 'swish'. The amount of noise emitted tends to vary depending on the wind speed. Background noise levels at nearby properties will also change with wind speed, increasing in level as wind speeds rise due to wind in trees and around buildings, etc.

9.7 Predicted wind farm noise levels take full account of the potential combination of the noise from the Proposed Development along with the operational Fallago Rig Wind Farm adjacent to the Site. An indicative cumulative assessment was also undertaken for the Newlands Hill Wind Farm (the application for which has not yet been submitted) based on preliminary information. Other, more distant wind farms were not considered as they do not make an acoustically relevant contribution to cumulative noise levels.

9.8 Predicted turbine operational noise levels have been compared to the limit values to demonstrate that turbines of the type and size which would be installed can operate within the limits so derived. It is concluded therefore that operational noise levels from the wind farm will be within levels recommended in national guidance for wind energy schemes.

Mitigation Proposed

9.9 No Significant Effects were identified by the assessment and so no mitigation is proposed.

Residual Effects

9.10 No Significant residual Effects were identified following the assessment.

10. Access, Traffic and Transport

Introduction

10.1 This chapter considers the potential effects of the Proposed Development on Access, Traffic and Transport during the construction phase, as this is considered to be the phase which has the greatest potential impact.

10.2 The operational phase is restricted to maintenance operations which generate significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network.

Overview of Methodology

10.3 The methodology adopted in this assessment involved the following key stages:

- Describe the existing access network and transport baseline;
- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the potential effects, including direct, indirect and any potential cumulative effects;
- Describe the mitigation measures proposed to address likely significant effects (if required); and
- Assess the residual effects remaining following the implementation of mitigation (if required).

Baseline Conditions

10.4 The Proposed Development will be accessed via the existing Fallago Rig Wind Farm access junction on the B6456, to the east of Westruther in the Scottish Borders. The access junction will provide access to the Site for all abnormal loads associated with the turbine deliveries, as well as access for Heavy Goods Vehicles (HGVs) delivering construction materials and general Site traffic.

10.5 Construction traffic associated with the Proposed Development will generally approach from the west and all Abnormal Indivisible Load (AIL) traffic access from the Port of Entry (POE) at Rosyth, utilising the proven abnormal load route used during the construction of Fallago Rig Wind Farm.

10.6 Baseline traffic data was obtained from a combination of Automatic Traffic Count Surveys (ATCs) and existing information from the UK Department for Transport (DfT) and Transport Scotland (TS) databases.

10.7 There are limited pedestrian facilities in the immediate vicinity of the Proposed Development, reflecting the rural nature of the area. There are however a number of Core Paths and Public Rights of Way within the Site and the surrounding area. The majority of the paths appear to be recreational in nature and do not appear to provide key commuter / school traffic linkages to the surrounding settlements.

Assessment of Effects

10.8 The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 11 of the construction programme. During this month, an average of 68 HGV movements is predicted per day and it is estimated that there will be a further 42 car and light van movements per day to transport construction workers to and from the Site.

10.9 The assessment of significance suggests that the effects on the following receptors are considered significant, prior to the application of mitigation measures:

- D52 Proposed Site Access Road Users;
- B6456 Users; and
- Core Path / Public Right of Way Users within the Site.

10.10 It should be noted that the impacts relate solely to the peak of construction activities and that the construction period is short lived and the effects temporary in nature.

10.11A cumulative assessment was not undertaken because no wind farm developments or other significant traffic generating developments with planning permission were identified, that would contribute to cumulative effects.

Mitigation Proposed

10.12 The following measures will be implemented to mitigate any adverse effects of construction traffic during the construction phase:

- Construction Traffic Management Plan;
- Abnormal Load Transport Management Plan;
- Access Management Plan; and
- a Staff Travel Plan.

10.13 The movement of AIL traffic will require small scale and temporary remedial works, which are presented in **Appendix A** of Appendix **10.1: Transport Assessment**.

Residual Effects

10.14 With the implementation of additional mitigation, no significant residual effects are anticipated in respect of traffic and transport issues. The residual effects are all assessed to be slight or insignificant and as they would occur during the construction phase only, they are temporary and reversible.

Introduction

11.1 The aviation assessment considers the effect of the operational turbines of the Proposed Development in relation to aviation and defence operations.

Overview of Methodology

11.2 The assessment considered following potential operational effects:

- Licensed airfields with a surveillance radar;
- Ministry of Defence (MOD) Air Defence Radar;
- NERL surveillance radar; and
- CAA and MOD Lighting Requirements.

11.3 The assessment methodology is based on the guidance in CAA CAP 764 Policy and Guidance on Wind Turbines Version 6. The assessment takes account of consultation undertaken with Edinburgh airport, the MOD and NERL.

Baseline Conditions

11.4 The Site is in an area that is relatively remote from civil and military aviation facilities. In civil terms it is 50 km to the south-east of Edinburgh Airport and in unregulated airspace. There are no MOD aviation facilities within the study area, the closest is the ATC radar at Deadwater Fell within Royal Airforce (RAF) Spadeadam which is over 60 km to the south.

11.5 The Site is located on the western end of the Lammermuir Hills in the Scottish Borders. This location is within MOD Low Flying Area (LFA) 16. At night this area converts to Night Allocated Region (NAR) 2A, an area primarily reserved for fast-jet low flying in the hours of darkness.

Assessment of Effects

11.6 The Proposed Development will require a comprehensive lighting arrangement to mitigate potential

effects on MoD low flying, as detailed in the **Appendix 11.1: Wind Farm Aviation Lighting and Mitigation Report**.

11.7 The Applicant is consulting with Edinburgh airport in relation to a technical assessment which they require to undertake. It is expected that there will be no operational effects on Edinburgh airport as the nearest turbine is more than 45 km from the airport.

11.8 The turbines will be visible to one of the long-range radars used by NATS En Route Ltd (NERL) at Great Dun Fell which will create an area of radar clutter (unwanted spurious radar returns) which will require technical mitigation. In military terms it is in an area designated for low flying but will have no effect on military Air Traffic Control facilities. The turbines will be visible to the MOD Air Defence radar at RRH Brizlee Wood.

11.9 During the period when the operation of the Proposed Development overlaps with the operation of the adjacent wind farm at Fallago Rig, there is the potential for a cumulative effect on the performance of the Brizlee Wood Air Defence Radar due to the fact that the area of potential effect will appear to be a single contiguous wind farm. This will need to be taken into account when discussing mitigation options with the MOD following receipt of their formal consultation response post submission.

Mitigation Proposed

11.10 For both the NATS Great Dun Fell radar and the MOD Brizlee Wood radar, technical mitigation options are likely to be available using existing capabilities and the interests of aviation stakeholders can be protected through the use of suitable planning conditions requiring the implementation of technical solutions.

Residual Effects

11.11 Following implementation of the technical mitigation, no residual aviation effects are predicted.

12. Other Issues

12.1 The other issues assessment assesses the effects of the Proposed Development on Climate Change, Shadow Flicker and Population and Human Health, including Dust.

12.2 A summary of the assessment and findings is presented for each topic in turn below.

12.3 Potential effects associated with socio-economics and major accidents and disasters have not been assessed due to reasons outlined in **Chapter 1: Introduction** of the EIA Report.

Climate Change

Introduction

12.4 The climate change assessment has considered the potential effects of the Proposed Development on climate change mitigation (including carbon balance) and adaptation.

Baseline Conditions

12.5 The assessment considered the projected changes in temperature, precipitation and wind speed and storms between 2050-2069, when the Proposed Development will reach the end of its lifetime. The projections highlight that in 2050-2069, summer and winter temperatures are likely to be greater than the current baseline (greater for summer), with winter rainfall increasing and summer rainfall decreasing.

Assessment of Effects

12.6 Overall, the Proposed Development will be a net generator of greenhouse gas (GHG) emissions during construction. A Minor (negative) (and Not Significant) effect is predicted in relation to carbon emissions including direct CO₂ and NO_x emissions from HGV vehicles.

12.7 Whilst it has not been possible to calculate construction traffic emissions for HGVs and personnel, overall, it is considered that these will be offset during the Proposed Development's operational life along with any backup generation if required, and that a **positive (significant)** effect is likely, in relation to carbon losses and savings.

12.8 Assuming a 35-year operational life and based on an overall expected annual carbon saving of approximately 50,000 tCO₂e and a total carbon loss (during both construction and operation) of approximately 90,000 tCO₂e, this equates to a total saving of approximately 1.7 million tCO₂e over the Proposed Development's operational lifetime. It is calculated that the CO₂ emissions that will be emitted as part of the construction of the Proposed Development will be paid back within approximately 22 months (or 1.8 years). In addition, over 5,700 tonnes of CO₂e gains are estimated from the restoration of a large area of degraded bog on the Site through re-wetting of degraded peat.

12.9 The Proposed Development's carbon saving potential will contribute positively to meeting Scotland's net zero greenhouse gas emissions targets.

12.10 In terms of adaptation, further consideration was given to whether or not the introduction of the Proposed Development is likely to affect judgements of effects and/or the ability of the receptors within or close to the Site to adapt to climate change. Predicting future outcomes is naturally difficult to predict, however in combination climate effects are not predicted to vary markedly over the Proposed Development's lifespan from the effects set out already in the EIA Report and summarised in this NTS.

12.11 Climate change is, in essence, a cumulative effect due to emissions from multiple sources including new development. All wind farms will involve the generation of direct and embodied GHG emissions during construction. It is assumed, however, that any other applications that are consented and built will include reasonable measures to avoid, reduce and /or avoid the generation of GHG emissions, particularly from construction traffic. Overall, a Minor (negative) cumulative construction effect is therefore predicted in relation to carbon emissions including direct CO₂ and NO_x emissions from HGV vehicles which is not significant.

12.12 In terms of carbon losses and offsetting, the Proposed Development, in combination with other onshore wind developments, will have a positive effect on offsetting emissions released from the burning of fossil fuels and will play an integral part in helping Scotland meet its climate change and energy targets. A **Positive (Significant)** cumulative effect is therefore identified, given the importance of this collective role of onshore wind generation to addressing the global climate emergency.

12.13 In relation to adaptation, with respect to in-combination climate effects, this is largely a project specific consideration and effects are considered to be not significant.

Mitigation Proposed

12.14 No specific mitigation measures are proposed in relation to climate change, although a CTMP will be implemented as good practice, with the intention that measures will be implemented to ensure traffic movements are undertaken efficiently during construction, and unnecessary journeys avoided.

Residual Effects

12.15 There will be a **Positive (significant)** effect in relation to carbon losses and carbon offsetting (climate change mitigation) during operation of the Proposed Development and a **Positive (significant)** effect in relation to carbon losses and carbon offsetting (climate change mitigation) cumulatively during operation.

Shadow Flicker

Introduction

12.16 The assessment considers potential shadow flicker effects from the operation of the Proposed Development on residents within residential properties.

12.17 Shadow flicker occurs when the sun shines onto a window of a building from behind a moving wind turbine causing a shadow to flick on and off as the wind turbine blades rotate and break the line of sight between the sun and the window. Shadow flicker occurs when a certain combination of conditions occur at a certain location, time of day and year, and may have a negative effect on residents and occupants of affected properties.

Baseline Conditions

12.18 There are four properties which could be potentially affected by the occurrence of shadow flicker.

Assessment of Effects

12.19 The theoretical maximum-case occurrence at three properties named Keepers House and the Byrecleugh Farm Cottages exceeds the significance threshold of 30 hours per year. Therefore, it is considered that these three properties could experience significant effects due to shadow flicker under the theoretical maximum scenario.

12.20 Following the calculation of the more realistic scenario, taking into account average sunny daylight hours when sunshine would be bright enough to cause the effects of shadow flicker, the shadow flicker predictions fall below the significance threshold level at all properties, and so effects are not significant. In reality, the occurrence of shadow flicker is likely to be reduced even further as the wind turbine blades will not always rotate for 365 days per year, for example, during low wind conditions or where maintenance is required.

12.21 Receptors may also not always be present in all affected rooms at all times. Trees, vegetation and local topography in the vicinity of the residential receptors may also have a shielding effect which could either reduce the effects of shadow flicker or eliminate shadow flicker completely.

Mitigation Proposed

12.22 It is not considered that mitigation for shadow flicker effects is required based on the realistic scenario results. Should the Applicant receive any complaints from nearby properties regarding shadow flicker effects, these will be fully investigated and suitable mitigation will be implemented in agreement with SBC.

Residual Effects

12.23 Residual operational effects will remain as not significant.

Population and Human Health, including Dust

Introduction

12.24 The Population and Human Health, including dust assessment has considered the effects of the Proposed Development on human health.

12.25 Other chapters of the EIA Report consider effects on health as a result of construction and operational noise and construction traffic accidents (See **Chapter 9: Noise and Vibration** and **Chapter 10: Access, Traffic and Transport** of the EIA Report).

12.26 Health effects as a result of deterioration of water quantity and quality of public and private water supplies are considered further in **Chapter 8: Hydrology, Hydrogeology, Geology and Peat** of the EIA Report.

Baseline Conditions

12.27 There are ten residential properties within 350 m of the construction works (there are no additional properties within 500m of the Site entrance located along the public highway):

- Crawlway is approximately 70 m from the nearest construction activity along the existing Fallago Rig access track.
- Wedderlie Farm Cottages (Cluster of six properties), about 20 m – 70 m from construction activities along the existing access track.
- Byrecleugh Keepers House and two Byrecleugh Cottages are also about 20 m – 100 m from the proposed access track leading up to T5.

Assessment of Effects

Dust

12.28 The Applicant is committed to adopting good practice measures for dust management during construction and will implement these through the Construction Environmental Management Plan (CEMP), thereby controlling and reducing any potential effects that dust generation may have on health (see **Appendix 3.1: CEMP** and Mitigation Proposed section below).

Health and Safety

12.29 The Construction (Design and Management) Regulations 2015 (the CDM Regulations) have formed an integral part of the conceptual design of the Proposed Development. Health and safety risks have been taken account of and their consideration reflected in the design. Surveys and investigations have been undertaken throughout the pre-consent phase to, as far as reasonably practicable, identify,

manage and if possible, avoid any potential risks during construction and operation.

Turbine Icing

12.30 With respect to turbine icing, the Scottish Government has previously stated in the 'Onshore wind turbines: planning advice note' that the build-up of ice on turbine blades is unlikely to present problems on the majority of sites. Even where icing occurs, the turbines' own vibration sensors are likely to detect the imbalance and inhibit the operation of the machines.

Mitigation Proposed

Dust

1.17 Dust management measures include:

- Where possible all machinery and dust-causing activities will be located away from the sensitive receptors mentioned above.
- Operatives of all construction vehicles must switch off engines when not moving or working onsite.
- All road-going vehicles will comply with current emissions standards.
- Movement of construction traffic around the site will be minimised, where possible.
- Appropriate speed limits will be set around the site.
- Loads will be covered if the load has the potential to generate dust.
- Dust and road cleanliness on the public road at the main Site access will be monitored.
- A wheel wash facility will be installed at the site compound and should it be deemed necessary a road sweeper will be deployed.
- Material deliveries and vehicle access will be timed to avoid the need for traffic to queue.
- Water will be used as a dust suppressant, where required and particularly in dry conditions, including at borrow pits and at the concrete batching area.
- Prolonged storage of material and debris on the site will be kept to a minimum.
- Completed earthworks and exposed areas will be covered or re-vegetated as soon as is practicable.
- Slopes of any stockpiles and mounds will not be greater than the natural angle of repose of the material. The stockpiles/mounds must not have sharp changes in

shape. Should a problem be identified with a stockpile then appropriate measures would be taken such as suppressants or sheeting.

- Appropriate wetting of soil surfaces will be carried out during earth moving activities to minimise contamination through airborne dust. This may be done using a water bowser or static sprinklers.
- Hard surfacing of internal roads will be completed as soon as practical to aid in minimising dust re-suspension.
- The existing Fallago Rig access track passes through Wedderlie Farm (near to the site entrance). The section through the farm will be re-surfaced with tarmac to minimise dust disturbance caused by construction and operational vehicles accessing Dunside and Fallago Rig Wind Farms.

Health and Safety

12.31 All construction activities will be managed within the requirements of the CDM Regulations and will also comply with the requirements of the Health and Safety at Work etc. Act 1974. To further reduce possible health and safety risks, a Health and Safety Plan for the project will be strictly adhered to throughout its construction, operation and decommissioning. All staff and contractors working on the construction will be required to comply with the safety procedures and work instructions outlined in the Plan.

12.32 To ensure that hazards are appropriately managed, risk assessments will be undertaken for all major construction, operational (e.g. maintenance) and decommissioning activities, with measures put in place to manage any hazards identified.

Turbine Icing

12.33 The Applicant will implement measures to ensure the safety of workers and the general public in relation to ice throw and ice fall, including notices alerting members of the public of the possible risk of ice throw and ice fall under certain conditions.

Residual Effects

12.34 On the basis that the above good practice measures will be in place for the duration of the construction period, no significant population and health effects are predicted. No Significant Residual Effects are predicted during operation or decommissioning.

13. Summary of Significant Effects

13.1 The EIA for the Proposed Development has been carried out in accordance with regulatory requirements and guidance on good practice. The findings of the surveys undertaken, in addition to consultation, have informed the design process and assessment.

13.2 Following the application of additional mitigation potential residual significant effects have been predicted within the EIA Report in relation to:

- Landscape and Visual: including significant adverse effects on three LCTs, nine viewpoints, and some routes within/close to the Site (including cumulatively with other wind farms);
- Cultural Heritage: adverse effects of moderate significance on the setting of Mutiny Stones, Long Cairn and Byreclough Farmstead) heritage assets; and
- Other Issues: Climate Change, positive significant effects, including cumulatively, on carbon losses and carbon offsetting (climate change mitigation).

13.3 The Significant adverse residual effects from the Proposed Development on landscape and visual and cultural heritage receptors cannot be mitigated further given the inherent nature of wind farm development, but they have been reduced to the lowest practical level through the evolution of the iterative design process. This has included a reduction in the number of turbines and their re-siting. However, for developments of this sort, it is difficult to fully avoid landscape and visual impacts and impacts upon heritage assets resulting from setting change during operation of the Proposed Development.

13.4 In addition, whilst Not Significant in EIA terms, positive effects are also predicted for peat and peatland habitats as a result of implementation of the OREP.