Appendix 6.1:

EIA Scoping Report

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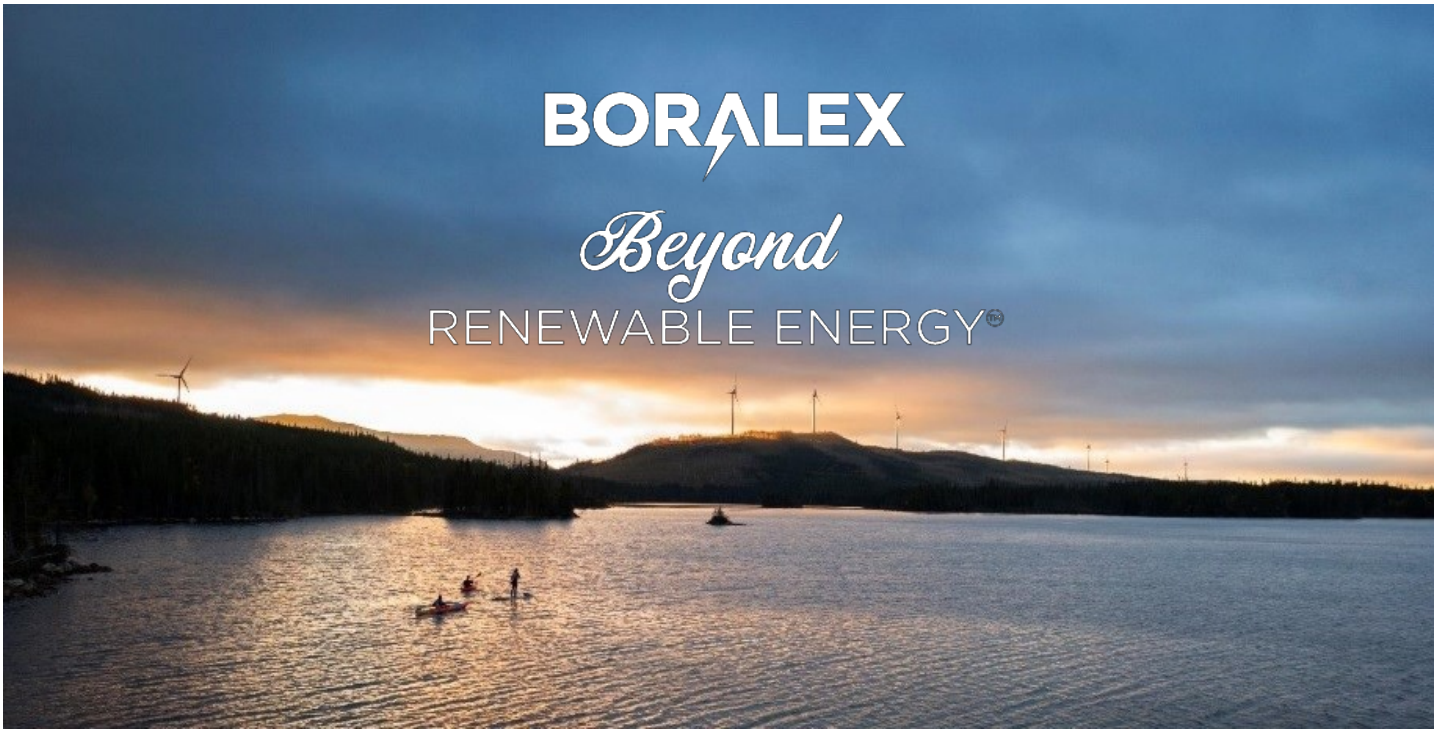

Shepherds' Rig Wind Farm

Section 36C

EIA Scoping Report

May 2024

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Contents

Abbreviations

Abbreviation	Definition
AEI	Additional Environmental Information
AIL	Abnormal indivisible loads
ANSP	Air Navigation Service Providers
AOD	Above Ordnance Datum
ASNW	Ancient, Semi-Natural Woodland
ATC	Automatic Traffic Count
BGS	British Geological Survey
CAA	Civil Aviation Authority
CEMP	Construction Environment Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CNS	communications, navigation and surveillance
CO_2	Carbon Dioxide
CoWRP	Control of Woodland Removal Policy
CTMP	Construction Traffic Management
DECC	Department for Energy and Climate Change
DGC	Dumfries and Galloway Council
DGERC	Dumfries and Galloway Raptor Study Group
DGRSG	Dumfries and Galloway Environmental Resources Centre
DGWLCS	The Dumfries and Galloway Wind Farm Landscape Capacity Study
DIO	Defence Infrastructure Organisation
DPSG	Designation Policy and Selection Guidance
DfT	Department for Transport

Abbreviation	Definition
EIA	Environmental Impact Assessment
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
FCS	Forestry Commission Scotland
GDL	Gardens and Designed Landscape
GIS	Geographical Information Systems
GLVIA3	Guidelines for Landscape and Visual Assessment Third Edition
GPG	Good Practice Guide
GW	Giga-Watts
GWDTEs	Groundwater Dependent Terrestrial Ecosystems
HEPS	Historic Environment Policy Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
IFP	Instrument Flight Procedure
IHBC	Institute of Historic Building Conservation
IOA	Institute of Statistics
JNCC	Joint Nature Conservation Committee
LCT	Landscape Character Type
LDP	Local Development Plan
LEPO	Long-established woodlands of plantation origin
LLP	Limited Liability Partnership
LUPS	Land Use Planning System

Abbreviation	Definition
LVIA	Landscape and Visual Impact Assessment
MCHE	Managing Change in the Historic Environment
MoD	Ministry of Defence
MW	Mega-Watt
NALs	Noise Assessment Locations
NATS	National Air Traffic Services
NIDL	Non-Inventory Designed Landscapes
NMLs	Noise Monitoring Locations
NPF3	National Planning Framework 3
NPF4	National Planning Framework 4
NRFA	National River Flow Archive
NRTF	National Road Traffic Forecast
NS	Nature Scot
NSA	National Scenic Area
NSR	Noise Sensitive Receptors
NTS	Non-Technical Summary
oBEMP	outline Biodiversity Enhancement Management Plan
OS	Ordnance Survey
OSA	Outer Study Area
PAN	Planning Advice Note
PMP	Peat Management Plan
PWS	Private Water Supply
RMS	Root means square
RSA	Regional Scenic Area
RSPB	Royal Society for the Protection of Birds
RSR	Route Survey Report

Abbreviation	Definition
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SF	Scottish Forestry
SG	Supplementary Guidance
SLA	Special Landscape Areas
SNH	Scottish National Heritage
SPA	Special Protection Area
SPEN	Scottish Water and Scottish Power Energy Networks
SRTM	Shuttle Radar Topography Mission
SSSI	Special Site of Scientific Interest
SUDs	Sustainable Urban Drainage System
SWSEIC	South West Scotland Environmental Information Centre
s36C	Section 36C
VP	Vantage Point
WFD	Water Framework Directive
WLA	Wild Land Area
ZTV	Zones of Theoretical Visibility

1. Introduction

1.1. Background and Context

1.1.1. SETT Wind Development Limited (hereafter referred to as "the Applicant") gained Section 36 and deemed planning permission from Scottish Minsters in August 2023 to construct and operate Shepherds' Rig Wind Farm (hereafter referred to as the "Consented Development"). The Consented Development comprises 17 turbines (15 turbines with a maximum blade tip height of 149.9 metres (m) and two turbines with a maximum blade tip height of 125 m) and associated infrastructure.

1.1.2. The Applicant now intends to apply to Scottish Minsters for consent under Section 36C of the Electricity Act 1989 (as amended) to vary the Consented Development. The proposed variations include:

- Removal of four turbines and associated crane hard standings;
- Increase in the maximum blade tip height of the remaining 13 turbines to 200 m;
- Relocation of three turbines slightly beyond the micrositing allowance;
- Amendments to part of the track layout to reflect turbine removal and relocation (as outlined above).

1.1.3. Collectively, the proposed variations listed above are referred to as the "Proposed Varied Development." The key element of the variation is that the locations of 10 of the proposed turbines are unchanged from the Consented Development, with the locations of the remaining three turbines only slightly adjusted to incorporate the constraints associated with larger turbines.

1.1.4. The Site of the Proposed Varied Development remains the same as the Consented Development and is located approximately 5 km to the east of Carsphairn and 10 km north of St John's Town of Dalry, in northern Dumfries and Galloway. The Site covers an area of approximately 752 hectares (ha) and is centred on approximate national grid reference (easting) 262319 and (northing) 593591.

1.1.5. The Proposed Varied Development is expected to comprise up to 13 wind turbines, each up to 200 m blade tip height as well as associated infrastructure. The total generating capacity is anticipated to be in the region of 81 MW, subject to final turbine model selection, with additional energy storage The associated infrastructure includes on-site access tracks, turbine foundations and crane hard standings, two temporary borrow pits, a substation, battery energy storage and control building compound, operational anemometry mast, on-site underground cabling, a temporary construction compound and a temporary concrete batching plant.

1.1.6. As the generating capacity of the Proposed Varied Development will exceed 50 MW, an application will be submitted to Scottish Ministers for consent under the terms of Section 36C of the Electricity Act 1989 (as amended) (hereafter referred to as a "s36C Application") and deemed planning permission under the terms of the Town and Country Planning (Scotland) Act 1997.

1.1.7. The application will be supported by an Environmental Impact Assessment Report (EIA Report) as required by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ("the EIA Regulations"). As per the EIA Regulations, the further assessment required to inform the s36C Application will consider the impacts of the Proposed Varied Development and how those impacts differ from those previously identified for the Consented Development.

1.1.8. This document forms the EIA Scoping Report submitted to the Energy Consents Unit (ECU) in order to request an EIA Scoping Opinion, on the content of the EIA of the Proposed Varied Development.

1.2. Project History

1.2.1. The original Scoping Report for the Consented Development was submitted to the ECU in 2013, seeking a Scoping Opinion on a layout of up to 45 turbines with a tip height of 149.5 m. Constraints analysis and layout design work continued to ensure the scheme was both environmentally sensitive and economically viable until the project was put on hold in 2015.

1.2.2. An updated Scoping Report for the Consented Development was submitted to the ECU in 2018 following a review of economic viability and the recommencement of environmental survey work. This included a layout of up to 30 turbines with a tip height of 149.5 m. Further modelling exercises during the design iteration process led to the Applicant submitting an EIA in November 2018 in support of a Section 36 application to seek consent for a 19 turbine development: 17 turbines at 149.9 m to tip, and 2 turbines at 125 m to tip.

1.2.3. Upon receipt of the consultation responses to the Section 36 application for the 19 turbine layout, the Applicant undertook further design and assessment work, amending the layout to 17 turbines as presented within an Additional Environmental Information (AEI I) report submitted in October 2019. Dumfries and Galloway Council objected to the Consented Development upon landscape and visual grounds, triggering a Public Inquiry, where the Applicant prepared a further Additional Environmental Information (AEI II) report (March 2021).

1.2.4. The Consented Development was granted Section 36 consent by Scottish Minsters in August 2023 following the Public Inquiry.

1.3. Variation Rationale

1.3.1. The Applicant has calculated that the energy yield of the Consented Development can be significantly increased by increasing the height of the proposed turbines. This increase in turbine height, together with the reduction in turbine numbers, should only result in limited changes to environmental effects. These primary factors have encouraged the Applicant to undertake a variation to the Consented Development, as outlined in this report.

1.4. The Applicant

1.4.1. The original s36 application was submitted by Infinergy on behalf of the applicant SETT Wind Development Limited, a company formed by Infinergy Limited and Boralex limited liability partnership (LLP). In July 2022, Boralex acquired 100% of Infinergy's interests in the UK.

1.4.2. The applicant for the section 36C variation application remains the same as before, SETT Wind Development Limited. Boralex Limited is the UK branch of Boralex Inc, a Canadian independent power provider. Boralex has been providing affordable renewable energy for over 30 years as a developer, builder, owner and operator of hydro, onshore wind, solar PV and battery storage. A leader in the Canadian market and France's largest independent producer of onshore wind power, the company is also active in the United States and the United Kingdom.

1.4.3. Over the past five years, Boralex's installed capacity has more than doubled to over 3GW. The development portfolio comprises over 6GW in wind, solar projects and storage projects. Boralex's shares are listed on the Toronto Stock Exchange under the ticker symbol BLX. Further information can be found at www.boralex.com.

1.5. The Purpose of the EIA Scoping Report

1.5.1. The purpose of the EIA Scoping Report, as per Regulation 12 (1) of the EIA Regulations, provides the opportunity for the Applicant to ask Scottish Ministers for an opinion as to the scope and level of detail of information to be provided within the EIA Report.

1.5.2. The Applicant recognises the value of the scoping approach, and the purpose of this report is to ensure that relevant issues are identified and to confirm that the assessment process described will meet legislative requirements.

1.5.3. This EIA Scoping Report:

- describes the existing Site and its context;
- describes the nature and purpose of the development;
- establishes the format of the EIA Report;
- provides baseline information; and
- describes potential significant effects and the proposed assessment methodologies for various technical assessments to be covered in the EIA Report.

1.5.4. This Scoping Report draws on existing baseline data and assessment work previously undertaken for the Consented Development to identify where significant effects are likely in terms of each of the relevant environmental topics. This assessment work includes that previously presented in:

- Shepherds' Rig Wind Farm EIA Report (Infinergy, 2018);
- Shepherds' Rig Additional Environmental Information Report I (Infinergy, 2019); and
- Shepherds' Rig Additional Environmental Information Report II (Infinergy, 2021).

1.5.5. Any environmental receptors where significant effects are likely as a result of the Proposed Varied Development are 'scoped in' and those where significant effects are unlikely are 'scoped out'. Each technical section concludes with questions for consultees regarding the information provided in this EIA Scoping Report, for which it would be useful to receive feedback. Not all questions will be relevant to all consultees, therefore we request that consultees provide feedback only on those questions appropriate to them. The questions should not be considered an exhaustive list, and consequently consultees are welcome to provide feedback on any issue they consider relevant to the Proposed Varied Development. If consultees elect not to respond, the Applicant will assume that consultees are satisfied with the approach adopted/proposed.

2. Approach to Environmental Impact Assessment

2.1. Assessment of the Proposed Variation Development

2.1.1. The EIA Regulations require that before consent is granted for certain types of development, an EIA must be undertaken. The EIA Regulations set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if there is the potential for significant environmental effects as a result of the development (Schedule 2 development).

2.1.2. The Proposed Varied Development falls within Schedule 2 of the EIA Regulations and has the potential to have some significant environmental effects. Therefore, it is the opinion of the Applicant that the Proposed Varied Development qualifies as "EIA Development" and therefore the Applicant will voluntarily submit an EIA Report, as part of a s36C Application and has not requested an EIA Screening Opinion.

2.1.3. EIA is a process which includes the requirement for the preparation of an EIA Report by the Applicant. This, amongst other matters is required to provide a description of the potential significant environmental effects of the development proposed. The work involved in this process informs the eventual design of the proposals. The final design will seek to avoid, reduce, offset and minimise any adverse environmental effects through mitigation. The EIA Report considers the effects arising during the construction, operation and decommissioning phases.

2.1.4. In line with the EIA Regulations, the assessment of the Proposed Varied Development will consider the impacts of the proposed variations and how those impacts differ from those previously identified for the Consented Development. The environmental topic chapters will consider:

- Baseline data from the 2018 EIA, 2019 AEI I and 2021 AEI II, where appropriate;
- Existing assessment conclusions and recommendations for the Consented Development;
- Any changes to guidance and policy documents;
- An assessment of the Proposed Varied Development in its own right
- A comparison of the effects of the Proposed Varied Development to the Consented and
- Cumulative effects.

2.2. Outline of the EIA Report

2.2.1. The structure of the EIA Report will follow the requirements of the EIA Regulations (Schedule 4) and other relevant good practice guidance. The EIA Report will comprise four volumes:

- Volume 1 – Written Statement;
- Volume 2 – Figures;
- Volume 3– Visualisations and photomontages; and
- Volume 4 –Appendices.

2.2.2. A Non-Technical Summary (NTS) will also be provided.

2.2.3. Chapters 1 to 6 of Volume 1 will comprise:

- an introduction;
- a description of the Site and its surroundings;
- a description of alternatives considered and scheme evolution;
- a description of the Proposed Varied Development;
- information on the EIA process and methodology, including a summary of consultation; and
- a summary of the relevant planning and energy policy context.

2.2.4. The remainder of Volume 1 will present a description of effects in respect of a range of environmental topics. Based on available baseline environment information and the details of the Proposed Varied Development, the environmental topics have been scoped on the basis of the potential for significant environmental effects. This has determined the need to undertake impact assessment to investigate each potential effect. The EIA Report will reference figures and technical studies, which will correspond to Volumes 2 to 4. The technical chapters of the EIA Report will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

2.2.5. It is considered that for many technical areas the effects are likely to be of a similar nature to those for the Consented Development. On this basis, elements which have been scoped into the EIA are:

- Chapter 7: Forestry;
- Chapter 8: Landscape and Visual;

- Chapter 9: Ecology;
- Chapter 10: Ornithology;
- Chapter 11: Cultural Heritage;
- Chapter 12: Geology and Peat;
- Chapter 13: Hydrology and Hydrogeology;
- Chapter 14: Noise and Vibration;
- Chapter 15:, Traffic and Transport;
- Chapter 16: Aviation;
- Chapter 17: Shadow Flicker; and
- Chapter 18: Climate Change and Carbon Balance.

2.2.6. The EIA Report will also include a schedule of mitigation measures and a summary of residual effects.

2.2.7. A standalone Planning Statement assessing the Proposed Varied Development against all relevant planning and energy policy will also accompany the s36C application, along with a Socio-economics, Tourism and Recreation Report, a Design and Access Statement and a Statement of Community Consultation Report explaining the consultation carried out with the local communities on the Proposed Varied Development.

2.2.8. An outline Biodiversity Enhancement Management Plan (oBEMP) will be also produced as part of the Proposed Varied Development application which will outline habitat restoration and enhancement measures.

2.2.9. Early consultation is key in the development process, and throughout the Applicant will ensure that local communities and stakeholders are given the opportunity to provide feedback and are kept informed of project progress. A public exhibition event will be held after submission of this EIA Scoping Report and a second public exhibition event will be held prior to submission of the EIA Report.

2.3. The EIA Team

2.3.1. **Table 2.1** below sets out the consultancy responsible for the assessments to be covered in the EIA. Where possible, the environmental team responsible for the assessments of the Consented Development have been retained for the Proposed Varied Development.

Table 2.1 – EIA Team Overview

Chapter	Assessment Topic	Contributor
1	Introduction	ITPEnergised
2	Site Description	ITPEnergised
3	Alternatives and Scheme Evolution	ITPEnergised
4	Description of the Proposed Varied Development	ITPEnergised
5	Planning and Energy Policy Context	David Bell Planning
6	EIA Methodology Scoping and Consultation	ITPEnergised
7	Forestry	DGA Forestry
8	Landscape and Visual	Pegasus
9	Ecology	BSG Ecology
10	Ornithology	Natural Research Projects (NRP)
11	Cultural Heritage	Headland Archaeology
12	Geology and Peat	Fluid Environmental Consultants
13	Hydrology and Hydrogeology	Fluid Environmental Consultants
14	Noise and Vibration	TNEI
15	Traffic and Transport	Pell Frischmann
16	Aviation	WPAC
17	Shadow Flicker	ITPEnergised
18	Climate Change and Carbon Balance	Fluid Environmental Consultants and ITPEnergised

2.3.2. Chapter 1 of the EIA Report will outline the environmental teams in full, including their relevant qualifications and experience.

3. Proposed Varied Development

3.1. Site Description

3.1.1. The Site remains the same as that of the Consented Development and is located approximately 5 km to the east of Carsphairn and 10 km north of St John's Town of Dalry, in northern Dumfries and Galloway (refer to **Figure 3.1**).

3.1.2. The Site lies approximately 2 km to the north of the Glenken valley, which contains a sequence of lochs and associated hydro schemes and is adjacent to the upper valley of the Water of Ken which lies close-by to the east. The Site lies approximately 3 km to the south-east of the summit of Cairnsmore of Carsphairn. The Site covers an area of approximately 752 hectares (ha) and is centred on approximate national grid reference (eastings) 262319 and (northings) 593591.

3.1.3. The Site comprises commercial coniferous woodland plantation and is bounded to the north and north-east by further forestry and to the west, east and south-east by open moorland. The majority of the Site comprises smooth rolling topography, with the exceptions of Cragengillan Hill located in the north of the Site (401 m AOD) and Marscalloch Hill situated on the south-western boundary (381 m AOD). The Southern Upland Way passes to the east of the Site.

3.1.4. The Scheduled Monument Craigengillan, cairn is located within the north-eastern part of the Site, and Stroanfreggan Craig fort is located approximately 300 m from the south-east boundary of the Site.

3.1.5. The nearest statutory ecological designation is the Cleugh Site of Special Scientific Interest (SSSI), which lies approximately 3.5 km to the south and is designated for its unimproved lowland neutral grassland. Dundeugh Wood, to the south of the Site, is listed in the Ancient Woodland Inventory.

3.1.6. The Site is not located within or near a national landscape designation, with the nearest, the Fleet Valley National Scenic Area, lying approximately 25 km to the south. The Galloway Hills Regional Scenic Area lies immediately to the west of the site and a small part of the western edge of the site lies within the RSA.

3.2. Consented Development Overview

3.2.1. The Consented Development comprises 17 wind turbines, 15 of which have a maximum blade tip height of 149.9 m and 2 of which have a maximum blade tip height of 125 m, as well as associated infrastructure and an on-site energy storage system. The turbine layout of the Consented Development is provided in **Figure 3.2**, and turbine locations, as well as tip heights, are noted in **Table 3.1**.

Table 3.1 - Consented Development Turbine Locations

Turbine Number	X Co-ordinate	Y Co-ordinate	Tip Height (m)
1	261952	595637	125
2	262221	595349	149.9
3	262915	595224	125
4	261734	595199	149.9
5	262475	594930	149.9
6	261915	594785	149.9
*	-	-	-
8	262100	594427	149.9
9	262404	594135	149.9
10	261985	593849	149.9
*	-	-	-
12	262325	593596	149.9
13	261738	593413	149.9
14	262667	593305	149.9
15	262123	593084	149.9
16	261438	592997	149.9
17	262482	592799	149.9
18	261690	592707	149.9
19	262045	592402	149.9

**Turbines 7 and 11 previously removed from the Consented Development design*

3.2.2. The associated infrastructure includes on-site access tracks, turbine foundations and crane hard standings, two temporary borrow pits, a substation, battery energy storage and control building compound, operational anemometry mast, on-site underground cabling, temporary construction compound and a temporary concrete batching plant. Its total generating capacity is 76.2 MW, based on the candidate turbine type.

3.3. Proposed Varied Development Description

3.3.1. The Proposed Varied Development will comprise up to 13 wind turbines, each up to 200 m blade tip height, as well as associated infrastructure. Its total generating capacity is anticipated to be in the region of 81 MW, based on the candidate turbine type. An indicative turbine layout for the Proposed Varied Development is provided in **Figure 3.3,** and a comparison between the Consented Development turbine layout and the Proposed Varied Development turbine layout is provided in **Figure 3.4**. Indicative turbine locations of the Proposed Varied Development are noted in **Table 3.2**.

Table 3.2 - Proposed Turbine Locations

Turbine Number	X Co-ordinate	Y Co-ordinate	Tip Height (m)
1	261952	595637	200
2*	262306	595375	200
3*	261572	595111	200
4	262475	594930	200
5	261915	594785	200
6	261986	593849	200
7*	262447	593709	200
8	261740	593414	200
9	262667	593305	200
10	261438	592978	200
11	262482	592799	200
12	261690	592707	200
13	262045	592403	200

Denotes a new turbine position from that consented

3.3.2. Although the final specification of the turbines is not known at this time, they are likely to be up to 200 m to maximum tip height.

3.3.3. In addition to the turbines, associated elements of the proposal will include

- turbine foundations;
- crane hard standings;
- a battery energy storage facility;
- on-site access tracks between turbines and from the point of access to the turbines;
- on-site substation and maintenance building with welfare facility and associated communications equipment;
- on-site electrical cabling between the turbines and the substation and battery energy storage system;
- a temporary construction compound;
- a temporary concrete batching plant;
- two borrow pits to provide aggregate for the construction of the development; and
- habitat enhancement areas including peatland restoration and native planting.

3.3.4. As with the Consented Development, a number of off-site road improvements will be required including over-run areas, primarily along the B729 between Carsphairn and the site access. These will be shown in an Abnormal Load Assessment appendix to the EIA Report. An environmental appraisal of the off-site road works will be provided in a further appendix to the EIA Report.

3.3.5. The parameters of the EIA will be such that an appropriate level of assessment is undertaken for a given hub height and rotor diameter, within the envelope of a maximum tip height. This can differ for technical disciplines in order to assess the worst case scenario for the EIA. The indicative turbine locations have been informed by previous environmental assessments undertaken for the Consented Development and may evolve in response to the ongoing detailed assessment work, taking consideration of the environmental effects, terrain, current land use, technical and health and safety issues in relation to the proposed variations. The parameters of the Proposed Varied Development will be explicitly identified in the EIA Report. The final locations of the turbines will be 'frozen' at an appropriate time to enable an appropriate level of assessment within the EIA Report, however it is not anticipated that the turbine locations presented at this Scoping stage will differ significantly from the 'frozen' design that will be assessed as part of the EIA.

3.3.6. Whilst the location of the infrastructure has been and will continue to be determined through an iterative environmental based design process, there is the potential for these exact locations to be further optimised through micro-siting allowances prior to construction. In this regard, the Applicant proposes a micro-siting allowance of up to 100 m in all directions within the Site boundary in respect of each turbine and the associated infrastructure in order to address any potential difficulties which may arise in the event that pre-construction surveys identify unsuitable ground conditions or environmental constraints that could be avoided.

3.3.7. Consent will be sought for an operational life of 40 years from the date of final commissioning of the wind turbines.

3.4. Cumulative Developments

3.4.1. The EIA Regulations state that cumulative effects should be considered as a part of the EIA. It will therefore be important to consider the cumulative effects of the Proposed Varied Development with other developments in the area, including those that are currently operational, consented and in planning.

3.4.2. The methodology to be adopted for assessing the cumulative effects of wind energy developments will be in accordance with the NatureScot (NS, 2021) Guidance 'Assessing Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments'. The scope of the cumulative assessment will be agreed through consultation with DGC and NS.

3.4.3. The cumulative baseline assessed for the Consented Development will be re-visited and updated as appropriate. It should be noted that this record will be updated throughout the EIA process, up to an agreed point prior to submission of the application. We welcome any further information from stakeholders on additional proposed wind farm developments that should be considered.

4. Planning and Energy Policy Framework

4.1. Introduction

4.1.1. This section presents a summary of relevant policy and guidance documents that will be taken into consideration to help inform the design of the Proposed Varied Development.

4.1.2. The EIA Report will set out the relevant policies that have been considered as part of the assessments undertaken throughout the EIA. A separate Planning Statement will provide a detailed appraisal of the Proposed Varied Development against the relevant Development Plan policies, national planning and energy policy and other material considerations.

4.1.3. The EIA Report will also concisely reference climate change policy and the contribution of Proposed Varied Development to the UK and Scottish Government's climate change goals and policy targets.

4.2. Climate Change & Energy Policy: Summary

4.2.1. The burning of fossil fuels to produce electricity is a major contributor to climate change through the release of atmospheric carbon dioxide and other harmful gases known collectively as greenhouse gases.

4.2.2. The Proposed Varied Development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.

4.2.3. In recent years UK and Scottish Government policies have focussed increasingly on concerns about climate change. Each tier of Government has developed targets, policies and actions to achieve targets to deal with the climate crisis and to generate more renewable energy and electricity.

4.2.4. The UK Government retains responsibility for the overall direction of energy policy, although some elements are devolved to the Scottish Government. The UK Government has published a series of policy documents setting out how targets can be achieved. Onshore wind generation, located in Scotland, is identified as an important technology to achieve these various goals.

4.2.5. The Scottish Government has published a number of policy documents and has set its own targets. The most relevant policy, legislative documents and more recent policy statements published by the Scottish Government include:

- The Scottish Energy Strategy (December 2017);
- The Scottish Government's declaration of a Climate Emergency (April 2019);
- The Scottish Climate Change Plan Update (2020);
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the legally binding net zero target for 2045 and interim targets for 2030 and 2040;
- The Scottish Government's 'Programme for Government' (2023);
- The Onshore Wind Policy Statement (December 2022); and
- The Draft Energy Strategy and Just Transition Plan (January 2023).

4.2.6. Further deployment of renewable energy generating technology will be required throughout the 2020s in order to meet targets. As a mature technology onshore wind has a continuing and important role to play, as confirmed by national planning and energy policy and most recently in national planning policy and in the new Onshore Wind Policy Statement.

4.2.7. Scotland's overarching statutory target is to achieve a 100% reduction in greenhouse gas emissions to net-zero by 2045, now provided for in the Climate Change (Scotland) Act 2009 as amended by the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019.

4.2.8. A large increase in the deployment of this renewable energy technology is supported through a number of UK level policy documents including the latest UK Energy White Paper (2020) and Net Zero Strategy (2021). Scottish Government policy commitments are also clear – most recently expressed in the Onshore Wind Policy Statement which will be material to the energy and national planning policy position to be considered for the determination of the application.

4.3. National Planning Framework 4

4.3.1. National Planning Framework 4 (NPF4) forms part of the statutory Development Plan. Section 13 of the Planning (Scotland) Act 2019 amends Section 24 of the Town and Country Planning (Scotland) Act 1997 (the '1997 Act') regarding the meaning of the 'development plan' such that for the purposes of the 1997 Act, the development plan for an area is taken as consisting of the provisions of:

- The National Planning Framework; and
- Any Local Development Plan (LDP).

4.3.2. NPF4 introduces centralised development management policies which are to be applied Scotland wide, and also provides guidance to Planning Authorities with regard to the content and preparation of LDPs.

4.3.3. The Proposed Varied Development would have national development status as per the policy provisions of NPF4.

4.3.4. In terms of development management and the application of national level policies, NPF4 states that:

"*The policy sections are for use in the determination of planning applications. The policies should be read as a whole. Planning decisions must be made in accordance with the development plan, unless material considerations indicate otherwise. It is for the decision maker to determine what weight to attach to policies on a case-by-case basis. Where a policy states that development will be supported, it is in principle, and it is for the decision maker to take into account all other relevant policies*".

4.3.5. The most relevant policies in NPF4 will include the following:

- Policy 1: Tackling the Climate and Nature Crisis;
- Policy 3: Biodiversity;
- Policy 4: Natural Places;
- Policy 5: Soils;
- Policy 6: Forestry, Woodland and Trees;
- Policy 7: Historic Assets and Places;
- Policy 11: Energy;
- Policy 22: Flood Risk and Water Management; and
- Policy 33: Minerals.

4.4. The Local Development Plan

4.4.1. The LDP applicable to the Proposed Varied Development is:

- The Dumfries and Galloway Local Development Plan 2 (LDP2) (adopted September 2019);
- LDP2 'Wind Energy Development: Development Management Considerations' Supplementary Guidance (February 2020). The SG contains at Appendix C, the 'Dumfries and Galloway Wind Farm Landscape Capacity Study'.

4.4.2. The most relevant LDP2 policies will include Policy IN1 'Renewable Energy' and Policy IN2 'Wind Energy'.

4.4.3. Other LDP2 policies that will be considered include the following policies:

- Policy OP1: Development Considerations;
- Policy HE1: Listed Buildings;
- Policy HE2: Conservation Areas;
- Policy HE3: Archaeology;
- Policy HE4: Archaeologically sensitive Areas;
- Policy NE1: National Scenic Areas;
- Policy NE2: Regional Scenic Areas;
- Policy NE4: Sites of International Importance for Biodiversity;
- Policy NE5: Species of International Importance;
- Policy NE6: Sites of National Importance for Biodiversity and geodiversity;
- Policy NE7: Forestry and Woodland;
- Policy NE8: Trees and Development;
- Policy NE11: Supporting the Water Environment;
- Policy NE14: Carbon Rich Soil;
- Policy CF4: Access Routes;
- Policy IN7: Flooding and Development;
- Policy IN8: Surface Water Drainage and Sustainable Drainage Systems (SuDS);
- Policy T1: Transport Infrastructure; and
- Policy T2: Location of Development / Accessibility.

4.5. Conclusions

4.5.1. The Proposed Varied Development would make a contribution to the attainment of renewable energy and electricity targets and emissions reduction at both the Scottish and UK levels and the quantification of this contribution would be described in the EIA Report.

4.5.2. The EIA Report will summarise the renewable energy policy framework, but the detail will be provided in a supporting Planning Statement to accompany the s36C Application which will also make reference to key policy documents such as the Onshore Wind Policy Statement (2022) which confirms the onshore wind target of an additional 8-12 GW of additional onshore wind capacity to be delivered by 2030.

5. Forestry

5.1. Introduction

5.1.1. This Chapter of the EIA Scoping Report sets out the approach which would be used to integrate the Proposed Varied Development into the existing woodland structure. A Proposed Varied Development Forest Plan will be prepared, which will detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the Proposed Varied Development. Forestry will be considered part of the project description, rather than as a receptor which requires a formal EIA assessment.

5.1.2. The Site comprises commercial coniferous woodland plantation and is bounded to the north and north-east by further forestry and to the west, east and south-east by open moorland. The forests within the Site are privately owned and managed. They consist primarily of commercial conifers with areas of native broadleaves, open ground habitats and water bodies.

5.1.3. In the UK there is a strong presumption against permanent deforestation unless it addresses other environmental concerns. In Scotland, such deforestation is dealt with under the Scottish Government's "Control of Woodland Removal Policy" (CoWRP) (Forestry Commission, 2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It will be essential that the Proposed Varied Development addresses and satisfies the requirements of the CoWRP.

5.1.4. The protection for Scotland's native woodlands has been strengthened with the introduction of National Planning Framework 4 (Scottish Government, 2023). Policy 6 Part b) states that:

"Development proposals will not be supported where they will result in:

i. Any loss of ancient woodlands, ancient and veteran trees or adverse impact on their ecological condition;

ii. Adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy;

iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy;"

5.1.5. This reinforces the implementation guidance for the CoWRP (Forestry Commission Scotland, 2019) which states there is a presumption against woodland removal of UK BAP priority woodland types in areas mainly composed of ancient, semi-natural woodland (ASNW), ancient woodlands planted with native species, long-established woodlands of plantation origin (LEPO) with significant biodiversity interest, or well-established semi-natural priority woodland types.

5.2. Existing Baseline

5.2.1. A high level desk based assessment has identified there has been little change in the baseline since the previously identified baseline for the assessment for the Consented Development. The desk-based assessment revealed no woodland designations affecting the forests within the Site. The commercial conifer crops are in the second rotation, with ongoing felling and replanting programmes. The forests are managed under two separate Forest Plans.

5.2.2. The timber from the Site will be despatched via the B729. The B729 is a consultation route for timber traffic and is subject to an agreed usage protocol with Dumfries and Galloway Council and forestry users. Proposed Varied Development related timber traffic will need to be integrated into other timber traffic using this route in agreement with the forestry industry and Dumfries and Galloway Council.

5.3. Consultation

5.3.1. Scottish Forestry (SF) were consulted as part of the original application. They did not object to the Consented Development but had some concerns about how the area of woodland loss and compensatory planting was calculated. This was addressed in a supplementary Technical Note produced by the Applicant which confirmed that the woodland loss was calculated as per the Implementation Guidance to the CoWRP. SF will be consulted on the Proposed Varied Development forestry plans. In addition, there may be interrelated issues raised by other consultees.

5.4. Proposed Scope of Assessment

5.4.1. Commercial forests are dynamic environments, constantly changing through, for example, landowner activities; market forces; natural events, such as windblow, pest and diseases; or developments. Forestry is not regarded as a receptor for EIA purposes. The forestry assessment will be a factual assessment describing the changes to the forest structure resulting from the incorporation of the Proposed Varied Development into the forests, in particular the loss of woodland area. Other Chapters within the EIA Report will identify the sensitive receptors relevant to their disciplines and report on the effects of the Proposed Varied Development due to the forestry proposals.

5.5. Assessment Methodology

5.5.1. The methodology will not differ from that undertaken for the Consented Development.

5.5.2. The forestry baseline will describe the crops existing at time of preparation of the EIA Report. This will include current species; planting year; felling and replanting plans; and other relevant woodland information. The baseline will be compiled from a desk-based assessment and field surveys. The desk-based assessment will include landowner crop databases; the Native Woodland Survey of Scotland (Forestry Commission Scotland, 2013); the Ancient Woodland Inventory Scotland (Scottish Natural Heritage, 2010); the Native Woodland survey of Scotland (2013); aerial photography; SF publicly available databases; and current Policy, Legislation and Guidance.

5.5.3. The field survey will consist of a Site walkover to verify and update baseline data as necessary; assess the crops with respect to integration of the development infrastructure; and to identify any opportunities within the woodlands for on-site compensatory planting, if required.

5.5.4. A Proposed Varied Development Forest Plan will be prepared. This will include a felling plan to show which woodlands are to be felled, and when, for the construction and operation of the Proposed Varied Development. It will further include a restocking plan showing any areas which are to be replanted and with which species, and which areas are to be left unplanted for Proposed Varied Development infrastructure.

5.5.5. A key issue will be the integration of the Proposed Varied Development infrastructure into the forest structure to minimise the loss of woodland area and to prevent fragmentation of the remaining woodlands. Forest design and the effect of the Proposed Varied Development infrastructure on it is an important part of the overall design process.

5.5.6. The changes to the woodland structure will be analysed and described including changes to woodland composition; felling and restocking plans; and traffic movements. The resulting changes to the woodland structure will be assessed for compliance against the UKFS (Forestry Commission, 2017) and the requirement for compensation planting to mitigate against any woodland loss. The Proposed Varied Development Forest Plan will be assessed against the baseline data in line with the methodology outlined in Annex V of the Control of Woodland Removal Policy Guidance.

5.6. Existing Planning Conditions

5.6.1. The Consented Development was subject to Planning Condition 34: Compensatory Planting detailed below:

Compensatory Planting

(1) Prior to the commencement of development, a scheme to compensate for the removal of 62.72 hectares of existing woodland (the scheme) shall be submitted to and approved in writing by the Planning Authority in consultation with Scottish Forestry.

(2) Thereafter the scheme shall be implemented in accordance with the approved details.

Reason: To secure replanting and protect Scotland's woodland resources in accordance with the Scottish Government's policy on the Control of Woodland Removal.

5.6.2. The area of woodland loss and compensatory planting required will be recalculated based on the felling and restocking required to integrate the Proposed Varied Development into the forest structure.

5.7. Potential Mitigation

5.7.1. Measures to avoid or mitigate potential effects upon the forests will, as far as practicable, be embedded in the design of the Proposed Varied Development through consideration of the siting of the wind turbines; and by using existing access tracks and forest roads where possible. Woodland loss will be minimised by keyholing infrastructure into the felling and / or restocking plans as appropriate. Potential forms of mitigation may include a redesign of the existing forest structures including, for example, changes to the felling programme; the use of designed open space; alternative species and woodland types; changing the management intensity; or the provision of compensatory planting on or off-site.

5.8. Potential Impacts

5.8.1. There is potential for changes to the forest structure resulting from the Proposed Varied Development, with consequential implications for the wider felling and restocking plans across the remaining parts of the forests. Areas of forest are anticipated to be required to be felled for the construction and operation of the Proposed Varied Development including for access tracks, wind turbine locations and other infrastructure. The potential impacts will be changes to the structure of the woodlands, which may result in a loss of woodland area.

Abnormal Load Route

5.8.2. An updated assessment of potential impacts on access improvements along the B729 (originally submitted as part of the 2021 AEI II) will also be carried out for the Proposed Varied Development, included as an appendix to the EIA Report. This appraisal will be based on the results of an updated swept path analysis required due to the larger abnormal indivisible loads associated with the proposed taller turbines. Off-site road works would be limited in extent, with limited vegetation clearance required at localised locations of oversail. Removal of any trees, if required, would be subject to compensatory planting and agreed with Scottish Forestry.

5.9. Receptors and Impacts Scoped In or Out of Assessment

5.9.1. The changes to the woodlands for a particular development are regarded as site-specific and it is considered there are no cumulative on-site forestry issues to be addressed, therefore cumulative forestry effects are scoped out of the EIA.

5.10. Scoping Questions to Consultees

5.10.1. The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities.

- Are consultees content with the proposed methodology and scope for the forestry assessment?
- Do the consultees have any information, particularly with reference to new guidance, which should be taken into account?

6. Landscape and Visual

6.1. Introduction

6.1.1. It is acknowledged from the outset that, in common with almost all commercial wind energy developments that some landscape and visual effects would occur as a result of the Proposed Varied Development.

6.1.2. A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.

6.1.3. Therefore, it is proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and an LVIA Chapter be included in the EIA Report. The LVIA will be undertaken by Chartered Landscape Architects, who are experienced in the assessment of large scale, onshore wind energy projects and are fully familiar with the landscape in the vicinity of the Site.

6.1.4. It is proposed that the LVIA will consider the potential effects of the Proposed Varied Development upon:

- Individual landscape features and elements;
- Landscape character; and
- Visual amenity and the people who view the landscape.

6.1.5. The LVIA will seek to assess the effects associated with the Proposed Varied Development as a whole (i.e. in its own right), with an additional focus on the extent to which these effects differ from those identified previously in the LVIA for the Consented Development, clarifying in particular whether any new significant effects are predicted.

6.2. Existing Baseline

Landscape Character

6.2.1. The most up to date and relevant landscape character assessment covering the study area is the NatureScot 2019 landscape character assessment.

6.2.2. The majority of the Site and all the proposed turbines are located within Landscape Character Type (LCT 178) Southern Uplands with Forest - Dumfries & Galloway. Its key characteristics are described as:

- Large, smooth dome-shaped hills with large scale dark green forests on slopes and over lower summits.
- Predominantly simple, gently rolling landform.
- Some areas of more complex and smaller-scale landscapes, with steep slopes enclosing heads of valleys and/or where uplands remain open.
- Changing landscapes with large scale forestry operations and wind farm development.
- Forested areas dominated by Sitka Spruce, interspersed with mixed conifers and broadleaf planting, and undergoing felling and replanting in large coupes.
- Wind farms are a key characteristic in some areas.
- Expansive scale.

6.2.3. The remainder of the Site is covered by LCT160 - Narrow Wooded River Valley - Dumfries & Galloway and LCT 165 - Upper Dale - Dumfries & Galloway.

6.2.4. The NatureScot 2019 landscape character assessment was previously considered in the Landscape and Visual Section of the 2019 Additional Environmental Information submission for the Consented Development.

Dumfries and Galloway Council Wind Energy Development Management Considerations Appendix C Dumfries & Galloway Wind Farm Landscape Capacity Study. Supplementary Guidance – February 2020

6.2.5. The Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWLCS) assesses the sensitivity of landscape character types, and more locally defined character areas, to different sizes of wind turbine development.

6.2.6. The proposed turbines would fall within the 'Very Large turbines over 150 m high' typology and would be located within the Ken Unit of LCT 19a - Southern Uplands with Forest.

6.2.7. For LCT 19a, the DGWLCS notes that:

'The Southern Uplands with Forest (19a) generally comprises an expansive, gently undulating upland plateau of smoothly rounded hills which extends into neighbouring Scottish Borders in the Craik Forest area and into East Ayrshire north of the Carsphairn unit… The Ken unit is more intercut by valleys and features a number of smaller scale local landscapes and dramatic corries at the heads of glens. Extensive coniferous forest cover masks landform and there is often little open ground with this largely confined to grass moorland within valleys and on the higher hill tops and ridges. An exception to this is the Ken unit which has a greater proportion of open ground to forest cover. Wind farm development is a key feature within the West Langholm, Carsphairn and Ken units of this landscape character type'.

6.2.8. It goes on to note that: '*Sensitivity would be High-medium for the Very Large typology (turbines 150 m+)'.*

6.2.9. The DGWLCS also provides Guidance for Development in LCT 19a stating:

'There is some scope for the Very Large typology (turbines150 m+) to be accommodated in this character type but only in the Eskdalemuir unit, which is undeveloped, very extensive in scale and distant from more settled areas. Cumulative effects with other operational and consented wind farms and effects on adjacent glens and landmark hills are a key constraint to this typology in the Carsphairn, Ken and West Langholm units within this character type'.

6.2.10. The 2020 version of the DGWLCS replaced an earlier 2017 version of the DGWLCS which had been considered in the LVIA for the Consented Development. Both the 2020 and earlier 2017 versions of the document were based on the same LCTs and LCT boundaries and the descriptions and sensitivity findings for LCT 19a set out above are unchanged between the two versions.

6.2.11. The LVIA will include an assessment of the sensitivity of landscape character, based on the LCTs contained in the DGWLCS, as was the case in the LVIA for the Consented Development. An assessment of the potential for the Proposed Variation Development to result in significant effects on the character of each LCT will then be provided, along with commentary regarding where any findings are different from those which were set out in the LVIA for the Consented Development.

Landscape Designations

6.2.12. There are no international landscape designations covering the Site or located within 35 km. There is one National Scenic Area (NSA) located within 35 km, namely the Fleet Valley National Scenic Area, which is located over 25 km from the Proposed Variation Development.

6.2.13. The closest regional scenic area is the Galloway Hills RSA, which partly falls within the western edge of the Site boundary. As was the case with the Consented Development, five of the proposed turbines in the Proposed Varied Development are located within the RSA, two of which fall on the very cusp of the designated landscape.

6.2.14. The Thornhill Uplands RSA is located 10 km to the east of the Proposed Variation Development, whilst the Terregles Ridge RSA is located 24 km to the south-east.

6.2.15. There are a small number of Special Landscape Areas and Sensitive Landscape Areas located within 35 km, all of which are outwith the Dumfries and Galloway administrative area. These include the Leadhills and Lowther Hills SLA, South Lanarkshire, which is located within 30 km to the north-east of the Proposed Varied Development. Similarly, within the East Ayrshire administrative district, there are two SLAs located within the wider study area. The first is located within 7 km to the north of the Site, north of Carsphairn Forest. The second is located within 13 km of the Site, in a north-westerly direction, in the vicinity of Dalmellington.

6.2.16. The nearest Garden and Designed Landscape (GDL) is Craigengillan, around 15 km to the north-west of the Site.

6.2.17. The LVIA will include an assessment of the potential for the Proposed Varied Development to result in significant effects on the above designated landscapes, along with commentary regarding where any findings are different from those which were set out in the LVIA for the Consented Development.

Wild Land

6.2.18. Wild Land Areas (WLAs) are mapped and described by NatureScot and are considered sensitive to development. The Proposed Varied Development is not located within a WLA. The nearest WLA is Merrick (WLA 1) located approximately 13 km to the west of the Proposed Varied Development.

6.2.19. Given the distance between the Proposed Varied Development and the WLA, it is considered that the Proposed Varied Development would have limited potential to result in notable effects on the key attributes and qualities of the WLA.

6.2.20. The matter of wind energy and Wild Land is addressed in Policy 4 of the NPF4 which states that "*Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration*".

6.2.21. As such it is proposed to scope out effects on wild land from the LVIA chapter.

Visual Receptors

6.2.22. A detailed consideration of the potential for effects to the visual amenity of receptors in the landscape surrounding the Site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints, which are listed in **Table 6.1**.

6.2.23. The LVIA will focus on the potential effects of the Proposed Varied Development on different visual receptors comprising settlements, footpath users, recognised tourist routes, long distance walking routes, cycle routes, centres for tourism and road and rail routes. Commentary will also be provided regarding where any findings are different from those which were set out in the LVIA for the Consented Development.

Residential Visual Amenity

6.2.24. A number of residential properties are located within the vicinity of the Proposed Varied Development. As with the LVIA for the Consented Development, it is again proposed that a Residential Visual Amenity Assessment (RVAA) will be undertaken as part of the LVIA. This will consider the visual effects on those properties located within 2 km of the Proposed Varied Development and identify if any would experience an overbearing effect. The findings will be presented in a separate Appendix to the LVIA chapter.

6.3. Guidance and Legislation

6.3.1. The LVIA will be prepared in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment (GLVIA3).

6.3.2. The methodology and assessment criteria proposed for the LVIA will be developed in accordance with the principles established in this best practice document. It should be acknowledged that GLVIA3 establishes guidelines, not a specific methodology. The preface to GLVIA3 states:

"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."

6.3.3. The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose. Consideration has also been given to the following documents:

- NatureScot (2022) Landscape Sensitivity Assessment Guidance (Methodology);
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments;
- NatureScot (2020) General pre-application and scoping advice for onshore wind farms;
- NatureScot (September 2020) Assessing impacts on Wild Land Areas – technical guidance;
- Landscape Institute (2021) Assessing landscape value outside national designations, Technical Guidance Note 02/21;
- SNH (2017) Siting and Design of Wind farms in the Landscape, Version 3a;
- SNH (2017) Visual Representation of Wind farms Version 2.2;
- SNH (2018) A Handbook on Environmental Impact Assessment, Appendix 2: Landscape and Visual Impact Assessment, Version 5;
- Landscape Institute (2019) Technical Guidance Note 06/19, Visual Representation of Development Proposals; and
- Landscape Institute (2019) Technical Guidance Note 02/19, Residential Visual Amenity Assessment.

6.4. Consultation

6.4.1. As part of the LVIA for the Consented Development, consultation was undertaken with Scottish Natural Heritage (SNH) [now NatureScot] and the Landscape Officer at Dumfries and Galloway Council regarding the 22 LVIA assessment viewpoints.

6.4.2. In response to the EIA Report (November 2018) for the Consented Development, consultation responses relevant to the landscape and visual assessment were received from SNH, the Dumfries and Galloway Landscape Officer, Carsphairn Community Woodland Ltd and Mountaineering Scotland. The nature of the responses related primarily to potential adverse effects upon the Galloway Hills Regional Scenic Area (RSA), as well as cumulative landscape and visual impacts on residents in the Upper Glenkens. A summary of the matters raised by relevant consultees during consultation and the Applicant's response was set out in the 2019 Additional Environmental Information submission for the Consented Development.

6.5. Study Area

6.5.1. The extent of the primary study area for the LVIA undertaken for the Consented Development was 35 km radius from the Site in all directions.

6.5.2. With reference to Visual Representation of Wind Farms, Version 2.2 based on the blade tip height of the Proposed Varied Development, an initial study area of up to 45 km should now be considered for the purposes of establishing a preliminary evaluation of the likely receptors. It is therefore proposed that the LVIA will consider an initial 45 km radius LVIA study area. Detailed assessment will then be provided for a 20 km section of this study area, which it is considered represents a proportionate extent of the study area and t within which potential significant effects are most likely to occur.

6.5.3. A comparative digital Zone of Theoretical Visibility (ZTV) model has been produced as a starting point to illustrate the geographical area within which views of the Proposed Variation Development are theoretically possible and how these differ from the theoretical visibility of the Consented Development. This was based on a 'bare-earth' scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV to Blade Tip is included at **Figure 6.1** with enlargement of its central section at **Figure 6.2.** The ZTV to Hub Height is included at **Figure 6.3** with an enlargement of its central section in **Figure 6.4.**

6.5.4. In terms of cumulative effects, in the LVIA undertaken for the Consented Development the approach adopted in the cumulative LVIA was to focus on other wind farms which were either operational, under construction, consented or the subject of a full planning application and which had the potential to give rise to significant cumulative effects when considered in combination with the Consented Development. Rather than simply considering every other wind farm within a set distance of the Consented Development, the approach was to focus the assessment on those sites which had the potential to give rise to significant cumulative effects.

6.5.5. For the Proposed Varied Development, it is again proposed to undertake a cumulative assessment which considers those developments which have the potential to give rise to significant cumulative effects. These schemes lie broadly within an area of 15 km and are illustrated in **Figure 6.5**. Further details of the approach to cumulative assessment, and an initial list of cumulative developments proposed to be considered in the assessment, are provided in Paragraphs 6.6.15 to 6.6.23 and **Table 6.2** below.

6.6. Assessment Methodology

6.6.1. It is proposed that the main objectives of the LVIA will be as follows:

- To identify, evaluate and describe the current landscape character of the Site, its surroundings and any notable individual or groups of landscape features within the Site, discussing any changes since the LVIA for the Consented Development was undertaken;
- To determine the sensitivity of the landscape to the type of development proposed, discussing any changes since the LVIA for the Consented Development was undertaken;
- To identify potential visual receptors (i.e. people that would be able to see the Proposed Variation Development) and evaluate their sensitivity to the type of changes proposed, including identifying if there are any new receptors since the LVIA for the Consented Development was undertaken;
- To identify and describe any impacts of the Proposed Varied Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts, noting also how these judgments may differ from those set out in the LVIA for the Consented Development;
- To identify and describe any mitigation measures (including mitigation which is inherent in the design and layout of the Proposed Varied Development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
- To identify and assess any cumulative landscape and visual effects, identifying if there are any changes to the assessment since the LVIA for the Consented Development was undertaken;
- To evaluate the level of residual landscape and visual effects, noting if there are any changes since the LVIA for the Consented Development was undertaken; and
- To make a professional judgement about which effects, if any, are significant, noting if there are any changes since the LVIA for the Consented Development was undertaken.

6.6.2. In accordance with the published guidance, landscape and visual effects will be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:

- landscape effects relate to the effects of the Proposed Varied Development on the physical and perceptual characteristics of the landscape and its resulting character and quality; and
- visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Proposed Viewpoints

6.6.3. Having reviewed the Comparative ZTV (**Figure 6.1**), it is not considered that there are any further locations which would have notable visibility of the Proposed Varied Development when compared with the Consented Development. It is therefore proposed that the same 22 locations which were used in the LVIA for the Consented Development are used again for the LVIA. These are set out in **Table 6.1** and shown on **Figures 6.1 and 6.2** The viewpoints represent visual receptors, LCTs and landscape designations at a range of distances and directions from the Site.

Table 6.1 Proposed LVIA Viewpoints

Name/ Receptor	OS Grid Ref
1. Stroanfreggan Bridge (B729)	264539, 591797
2. Stroanfreggan Craig	263712, 592093
3. Guttery Glen (B729)	265776, 591732
4. Smittons Bridge	263406, 591856
5. Stroanfreggan Cairn	264016, 591415
6. Head of Ken Valley	265860, 598002
7. Southern Upland Way at Culmark Hill	264460, 589630
8. Minor Road south of B729	268509, 590654
9. High Bridge of Ken	261970, 590159
10. Southern Upland Way, Benbrack (Striding Arch)	268029, 597036
11. B7000 at East Arndarroch	261845, 589285
12. Dundeugh Hill	260971, 589741
13. Beninner	260583, 597157
14. Cairnsmore of Carsphairn	259459, 597979
15. Craig of Knockgray	257054, 594385
16. Alhang	264228, 601023
17. Southern Upland Way at Waterside Hill	260768, 582043
18. A713 at Stroangassel	260313, 586825

Name/ Receptor	OS Grid Ref
19. A713 south of Carsphairn	257702, 592193
20. Woodhead Mines	252893, 593756
21. Corserine (Hennessey's Shelter)	250447, 587287
22. Carsphairn War Memorial	256859, 593089

6.6.4. Each of the representative viewpoints will be re-visited to evaluate the sensitivity of views and establish if there has been any change since the LVIA for the Consented Development. In addition, the study area will also be extensively visited to consider visibility of the Proposed Varied Development as receptors move through the landscape.

6.6.5. The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. The sensitivity of different receptor groups will be set out in the LVIA methodology. The level of effect experienced by different visual receptors will be determined by considering the sensitivity of the receptors with the magnitude of change resulting from the introduction of the Proposed Varied Development. Commentary will also be provided regarding where any findings are different from those which were set out in the LVIA for the Consented Development.

Visualisations

6.6.6. Each of the 22 LVIA viewpoints will be illustrated with daytime period visualisations prepared in line with the NatureScot best practice guidance.

Night-time Lighting Assessment

6.6.7. Under Civil Aviation Authority (CAA) Regulations structures over 150 m in height are required to be lit with visible aviation lighting. Therefore, unlike the Consented Development which was for turbines less than 150 m in height, the Proposed Varied Development would require some degree of visible aviation lighting.

6.6.8. In accordance with the NatureScot guidance the LVIA will assess the additional visual effects of the aviation lighting in the main body of the LVIA chapter. The additional change introduced by the aviation lighting will form a component of the magnitude of change.

6.6.9. It has been established in recent appeal decisions that the effects of visible aviation lighting is *"wholly a visual concern"* and that *"without being able to see and fully appreciate the features of the landscape and the composition of views it is not possible to carry out a meaningful landscape character assessment."* [The Scottish Government. Crystal Rig IV Report to the Scottish Ministers. (2021) page 8.]

6.6.10. Therefore, the assessment of the visible aviation lighting will be concerned solely on the visual effects associated within the lighting. This consideration will be informed by a ZTV of the lit turbines, a turbine lighting intensity ZTV and night-time visualisations from a selection of viewpoints, illustrating the proposed lighting effects.

6.6.11. The final aviation lighting scheme is not yet confirmed, however the hub height ZTV at **Figure 6.3** and **6.4** are helpful when considering potential locations for night-time visualisations**.**.

6.6.12. It is proposed that the following night-time visualisations will be produced:

- Viewpoint 4 - Smittons Bridge;
- Viewpoint 11 – B7000 at East Arndarroch; and
- Viewpoint 22 - Carsphairn War Memorial.

6.6.13. In line with NatureScot Visualisation Guidance, the viewpoints selected represent locations from where people are most likely to experience the wind farm at night.

6.6.14. The viewpoints will be used to inform consideration of the potential visual effects on key visual receptors in nearby residential properties, settlements and users of the road network.

Cumulative Assessment

6.6.15. The LVIA will also consider the potential for any cumulative effects to arise. The requirement for consideration of cumulative effects under the EIA Regulations is set out in Schedule 4, part 5, as follows:

"A description of the likely significant effects of the development on the environment resulting from, inter alia: (e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources."

6.6.16. This represents a change to the wording of the previous Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2010 which stated: *"A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development".*

6.6.17. Therefore, there is no longer any requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent. However, it is acknowledged that current best practice guidance for cumulative impact assessment still refers to a consideration of proposals which are 'awaiting determination within the planning process with design information in the public domain' and states that: *"The decision as to which proposals in the planning / consenting system should be included in an assessment is the responsibility of the determining authority."*

6.6.18. As such, as was the case in the LVIA for the Consented Development, it is proposed in this LVIA to consider cumulative effects caused by the development of the site in conjunction with other sites which are either operational, under construction consented or the subject of a full planning application. The NatureScot best practice guidelines identify two principal types of cumulative visual impact:

- Combined visibility – where the observer is able to see two or more developments from one viewpoint; and
- Sequential visibility – where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.

6.6.19. The guidelines state that 'combined visibility' may either be 'in combination' (where two or more sites are visible from a fixed viewpoint in the same arc of view) or 'in succession' (where two or more sites are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Each of the above types of cumulative effect will be considered in the LVIA.

6.6.20. The assessment will also consider the potential cumulative effects of wind turbine aviation lighting, with reference to other wind farms that are either operational, under construction, consented or the subject of a full planning application which also have visible aviation warning lighting.

6.6.21. For the cumulative assessment, consideration has been initially given to a 60 km radius from the Site, as recommended by NatureScot best practice guidance. Following this, all other wind energy developments that are operational, under construction, consented, or subject to a valid full planning application within 35 km of the Proposed Varied Development have been identified and reviewed as part of the cumulative baseline.

6.6.22. However, in order that the cumulative assessment remains focussed on other developments that have the greatest potential to give rise to significant cumulative effects it is necessary at the outset to decide which developments need to be considered in detail, as to consider all developments within 35 km of the Proposed Varied Development would detract attention from the key issues relating to the application. In this landscape and visual context, wind farms over 15 km away are highly unlikely to give rise to significant cumulative effects. It is also considered appropriate and proportionate to scope out all turbines under 50 m, and any turbines between 50 m and 80 m which are located over 10 km distance from the Site. The cumulative impact assessment will therefore focus primarily on developments within approximately 15 km of the Proposed Varied Development.

6.6.23. The wind farms identified within **Table 6.2** and shown on **Figure 6.5** are therefore the developments for which the cumulative assessment will be primarily focussed.

Table 6.2 Cumulative Sites within 15 km

Site	Blade Tip height of turbines	Number of turbines
Operational		
Afton	120 m	27
Blackcraig Hill	110 m	23
Hare Hill	63.5 m	20
Hare Hill Extension	91 m	35
Sanquhar	130 m	9
South Kyle	149.5 m	50
Wether Hill	91 m	14
Whiteside Hill	121 m	11
Windy Rig	125 m	12
Windy Standard I	92.5 m	36
Windy Standard II	100 - 120 m	30
Consented		
Benbrack	130 m	18
Cornharrow (resubmission)	149.9 m	8
Enoch Hill	149.9 m	15
Fell	180m – 200 m	9
Glenshimmeroch (Revised Tip Height)	160m – 180 m	10
Knockman Hill	81 m	5
Lorg	130m - 150 m	9
Margree	200 m	9
Pencloe	125 m	19
Sanquhar II	149m – 200 m	44

Site	Blade Tip height of turbines	Number of turbines
Torrs Hill	100 m	2
Troston Loch	149.9 m	14
Windy Standard III	120m - 177.5 m	20
In Planning		
Cloud Hill	180 m	11
Divot Hill	200 m	9
Euchanhead	230 m	21
Lorg (revised scheme)	149.9 m	12
Manquhill	200 m	8
Quantans Hill	200 m - 250 m	21

6.7. Existing Planning Conditions

6.7.1. There are no matters set out in the planning conditions for the Consented Development which are of particular relevance to the scope of the LVIA.

6.8. Proposed Mitigation

6.8.1. Mitigation measures may include measures seeking to achieve the following:

- avoidance of effects;
- reduction in magnitude of effects; and
- compensation for effects (which may include enhancements to offset any adverse effects).

6.8.2. The primary mitigation adopted in relation to landscape and visual matters is likely to be embedded within the design of the Proposed Varied Development and will comprise the consideration given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Varied Development layout. This is sometimes referred to as 'mitigation by design'.

6.9. Potential Impacts

6.9.1. The LVIA will consider the potential effects of the Proposed Varied Development upon:

- individual landscape features and elements;
- landscape character;
- visual amenity and the people who view the landscape; and
- landscape designations as appropriate.

6.9.2. The LVIA will consider the effects at three different stages in the lifetime of the Proposed Varied Development:

- during construction of the Proposed Varied Development;
- during the operational lifetime of the Proposed Varied Development; and
- during decommissioning of the Proposed Varied Development.

6.9.3. Effects during the first and third of these phases are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Varied Development are considered to be long-term effects.

6.9.4. Following the judgement of the sensitivity of the landscape or visual receptor, the LVIA will provide a judgement as to the magnitude of change and the level of the effect experienced by each receptor, along with a statement to clarify whether the effect resulting from the Proposed Varied Development is significant or not.

6.10. Receptors and Impacts Scoped In or Out of Assessment

6.10.1. In order that the assessment remains proportionate and focuses on the key matters that have the potential to bring about significant effects, it is proposed that the following matters are scoped out of the assessment:

- **Effects on receptors located outside of the ZTV** - The Proposed Varied Development would not result in any effects where there is no predicted visibility;
- **Effects during decommissioning** - Effects during decommissioning would be very similar in nature to those experienced during the construction phase, except in reverse;
- **Effects on LCTs outside of the proposed detailed 20 km LVIA study area** – There would be no potential for indirect significant effects due to the distance from the Proposed Varied Development;

- **Effects on landscape character resulting from the proposed aviation lighting** - It has been established in recent appeal decisions that the effects of visible aviation lighting is "wholly a visual concern" and that "without being able to see and fully appreciate the features of the landscape and the composition of views it is not possible to carry out a meaningful landscape character assessment." (The Scottish Government. Crystal Rig IV Report to the Scottish Ministers. (2021) page 8.);
- **Effects on settlements beyond 10 km** - Due to the distance from the Proposed Varied Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- **Effects on core paths beyond 10 km** - Due to the distance from the Proposed Varied Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- **Effects on NSAs** - The Fleet Valley NSA is located over 25 km from the Proposed Varied Development. Due to the distance from the Proposed Varied Development and the limited theoretical visibility there is no potential for this receptor or more distant NSAs to experience significant visual effects;
- **Effects on the Terregles Ridge RSA** – There is virtually no ZTV coverage within the Terregles Ridge RSA which is located 24 km to the south-east. Given the distance between the Proposed Varied Development and the RSA any effects would be limited and would not be of such a scale so as to undermine its special qualities;
- **Effects on Wild Land** - Given the distance from the Proposed Varied Development to the nearest WLA and with reference to Policy 4 (g) of NPF4 that states that "Buffer zones around wild land will not be applied and effects of development outwith wild land areas will not be a significant consideration", effects on wild land will be scoped out of the assessment; and
- **Effects on GDL** - Due to the distance from the Proposed Varied Development and the limited theoretical visibility and intervening vegetation there is no potential for receptors to experience significant visual effects.

Assessment of the Effects of Offsite Road Works

6.10.2. As with the Consented Development, a number of off-site road improvements will be required including over-run areas, primarily along the B729 between Carsphairn and the site access. A landscape and visual appraisal will be carried out of the required works, setting out in tabular form the baseline landscape and visual conditions at the location of each works. An appraisal will then be carried out of the effects on landscape features, landscape character and visual amenity at each location, including any mitigation proposed. The appraisal will follow the same methodology used in the LVIA chapter and will be presented in an Appendix to the EIA Report.

6.11. Scoping Questions to Consultees

6.11.1. The following are considered to be the key issues which require consideration by the consultees:

- Are there any comments on the proposed study areas?
- Are there any comments on the proposed list of viewpoint locations in **Table 6.1**?
- Are there any further wind farm sites, to those listed in **Table 6.2**, to consider as part of the cumulative assessment?
- Do you agree with matters proposed to be scoped out of the assessment?
- Do you agree that the proposed scope of assessment is appropriate?

7. Ecology

7.1. Introduction

7.1.1. This chapter sets out the proposed approach to the assessment of construction, operational and decommissioning effects of the Proposed Varied Development on ecological features. Ornithological effects are considered in Chapter 8.

7.1.2. The approach to the Ecological Impact Assessment (EcIA) for the proposed Varied Development will be based on industry standard assessment methods. The main guiding document for the production of the Ecology chapter within the EIA Report will be the Guidelines for Ecological Impact Assessment developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2016)

7.2. Existing Baseline

Information sources

7.2.1. The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Shepherds Rig Wind Farm EIA Report, 2018;
- Shepherds Rig Wind Farm Additional Environmental Information (AEI) I, 2019;
- Shepherds Rig Wind Farm Additional Environmental Information (AEI) II, 2021;
- Publicly accessible online aerial imagery and Ordnance Survey mapping. Accessed January 2024, and:
- The UK Government's 'Magic' website (principally this is of use in locating statutory designated sites of nature conservation importance). Accessed January 2024.

The Site and its immediate surroundings

7.2.2. A full description of the site and the habitats it supports can be found in Chapter 9 and Appendix 9.1 of the original EIA Report (Infinergy, 2018). The Site is dominated by commercial forestry plantation. Other habitats recorded on-site include, blanket mire/bog, marsh, marshy grassland, dry heath/acid grassland and broadleaved woodland plantation.

7.2.3. The largest water courses on-site are Black Burn and Craigengillan Burn though multiple small burns are present across the Site, all draining east into the Water of Ken.

7.2.4. Forestry roads and access tracks are present throughout the Site, as well as two historic quarry sites and stone walls.

Baseline conditions

7.2.5. The scope of the ecological assessment was determined through a combination of desk study to identify existing biological data relating to the Site and surrounding area, baseline surveys, and consultation with relevant nature conservation organisations and stakeholders.

7.2.6. An Extended Phase 1 Habitat Survey of the Site was undertaken in April 2018 following standard Joint Nature Conservation Committee (JNCC) survey methodology. This survey classified and mapped natural and semi natural habitats, as well as identified habitat suitable to support protected species. No habitats of conservation interest, groundwater dependent terrestrial ecosystems, or sensitive botanical species were recorded. The Site is dominated by coniferous plantation woodland, including large areas which have been recently felled and restocked.

7.2.7. Specific surveys were also undertaken for a range of protected species within and up to 250 m of the Site. No evidence of badger, water vole or pine marten were recorded; however, evidence of otter, and red squirrel were documented. Low levels of bat activity and moderate species diversity was recorded across the Site.

7.2.8. Bat species observed were predominantly soprano pipistrelle and common pipistrelle, as well as daubenton's bat, brown long eared bat, and species belonging to the Myotis genus. Leisler's bat and noctule bat activity was also recorded, albeit at very low levels of activity.

7.2.9. Habitat suitable for salmonid spawning was recorded at eight of the nine watercourses surveyed; however, fish fauna survey found Atlantic salmon to be absent. Resident brown trout fry and parr were noted in low densities. The non-native invasive species North American signal crayfish was verified as being present within the Site.

7.3. Guidance and Legislation

7.3.1. This section presents an update of the legislation, policy and guidance referred to in the EIA Report (November 2018), the AEI I (October 2019) and the AEI II (March 2021) that will inform the approach to the design and assessment of the Proposed Varied Development; where relevant, updated guidance and legislation has been included in the paragraphs below.

7.3.2. Since the 2018 EIA Report, NatureScot (formerly Scottish Natural Heritage (SNH)) released updated bat survey guidance regarding bats and onshore wind turbine developments in the UK.

7.3.3. The approach to the collection of ecological data will be based on industry standard guidance wherever this is available and applicable to the Site. For example, an updated Phase 1 habitat survey will be completed in accordance with the approach outlined by JNCC (2010), bat surveys will follow SNH et al., 2021, and otter and water vole survey will be based on the approaches outlined by Chanin (2003) and Dean et al. (2016).

7.3.4. The approach to the ecological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance.

7.3.5. NPF4 was released in February 2023, this document outlines the national spatial strategy for Scotland, setting out spatial principles, regional priorities, national developments and national planning policy. National Planning Framework 4 replaces NPF3 which was current at the time the Consented Development was granted permission in 2018.

7.3.6. The main significant change between NPF3 and NPF4 is policy 3 relates to biodiversity. This includes restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals for national or major developments requiring EIA will only be supported where it can be demonstrated that the proposal will conserve, restore, and enhance biodiversity. Criterion iv requires developments to deliver significant biodiversity enhancements.

7.3.7. Dumfries and Galloway Council issued the current Adopted Local Development Plan 2 (LDP2) in October 2019. The plan outlines the local legislation for the natural environment. The following policies are relevant to ecology:

- Policy NE4: Sites of international Importance for Biodiversity;
- Policy NE5: Species of International Importance; and
- Policy NE6: Sites of National Importance for Biodiversity and Geodiversity.

7.4. Consultation

Statutory consultees

7.4.1. NatureScot had no objection to the Consented Development and was broadly content with the proposals in relation to ecology.

7.4.2. The Scottish Environment Protection Agency (SEPA) originally objected to the consented development based on seven turbine locations being positioned in areas of deep peat, and a lack of information on the impacts. The objection was withdrawn following a change in design which located the turbines in question outwith areas of deep peat.

Internal Scottish Government advisors

7.4.3. Marine Scotland had no objection to the Consented Development. It recommended regular visual inspections of all watercourses by the Ecological Clerk of Works (ECoW) during construction. During operation an integrated robust water quality monitoring programme was recommended at selected sites potentially impacted by the proposal and at control sites.

Non-statutory consultees

7.4.4. Of the non-statutory consultees only the Royal Society for the protection of Birds (RSPB) response was relevant to ecological impacts. The response was entirely related to birds and will therefore be outlined in Section 8 below.

7.4.5. Fisheries Management Scotland did not object to the Consented Development.

Consultees that did not respond

7.4.6. The consultees who did not provide a response to the Consented Development included, the Galloway Fisheries Trust, John Muir Trust and Scottish Wildlife Trust.

7.5. Assessment Methodology

Desk Study and Consultation

7.5.1. Baseline survey reports, together with the ecology chapter of the EIA Report (Infinergy, 2018) for the Consented Development will be fully reviewed as part of the desk study exercise.

7.5.2. If considered appropriate (based on consultation responses received from NatureScot in respect of the Consented Development) NatureScot will be consulted ahead of ecological survey work commencing in late spring 2024 to outline the proposed scope of works.

7.5.3. The South West Scotland Environmental Information Centre (SWSEIC) will be approached for records of protected and notable species in relation to the Site.

7.5.4. The EIA Report indicates that no data was returned by Dumfries and Galloway Bat Group, Red Squirrels in South Scotland, Scottish Wildlife Trust, Galloway Fisheries Trust, or Nith District Salmon Fisheries Board because all biological records held by these organisations are handled by SWSEIC or are available via publicly available resources. As such it is not proposed to request records from these bodies going forward.

Baseline Surveys

Phase 1 Habitat Survey

7.5.5. A Phase 1 Habitat Survey will be completed in accordance with industry standard (JNCC, 2010) survey guidance, and will aim to update the existing baseline for the Site. The survey area will extend to at least 300 m from turbine locations and 100 m from tracks and other infrastructure. This reflects Scottish Environment Protection Agency (SEPA) (2017) guidance, which recommends a 250 m perimeter survey area around all excavations of 1 m or more depth. The additional 100 m will help account for micro-siting.

7.5.6. During the Phase 1 survey plant communities in areas that are not dominated by coniferous plantation (such as marshy grassland, blanket bog, and heathland in open areas, forest rides and track-sides) will be assigned to National Vegetation Classification (NVC) survey categories where possible (dependent on the community types identified by Rodwell (1991)). Consideration will be given to any habitats present that are on the Scottish Biodiversity List, are of European Conservation Priority (Annex 1 habitats) or are potentially groundwater dependent. Representative photographs will be taken of the habitats present.

7.5.7. The data collected during the Phase 1 survey will be analysed and mapped in Geographic Information System (GIS). A separate figure will be generated using GIS that will show the (potential) Groundwater Dependent Terrestrial Ecosystems (GWDTEs) that could be affected by the works. GWDTEs will be identified in accordance with SEPA guidance.

7.5.8. Information on potential GWDTEs will be made available to the project hydrologist and wider project team in order to inform the design process and any further risk assessment work that may be considered appropriate.

Bat Survey

7.5.9. The bat survey work used to inform the Consented Development was completed in 2018, prior to the publication of the current industry standard guidance 'Bats and onshore wind turbines - survey, assessment and mitigation' (NatureScot, et al., 2019; updated in 2021). The approach to updating the bat survey work will follow the current guidance.

7.5.10. The guidance recommends that data is collected at all turbine locations for wind farms of up to ten turbines, with one additional detector deployed for every three turbines over and above this. Based on the Proposed Varied Development layout, data will therefore need to be collected from eleven locations. Guidance also recommends a minimum of 10 nights of data collection per season; the static detectors will be deployed in spring, summer and autumn 2024. A weather station will be installed to collect site specific data on wind speed and other weather parameters for the periods when bat activity is sampled.

7.5.11. Guidance does not suggest that other surveys, such as walked transects (as were completed during the 2018 work at the Site) or vantage-point surveys (for bats) are routinely completed to inform wind farm planning applications unless there are site-specific reasons that suggest this would improve the quality of the data set. Based on the habitats present (principally coniferous plantation) and the results of the surveys undertaken in 2018, there appears to be no driver for such additional work.

Otter and Water Vole Surveys

7.5.12. Tributaries of Poldore Burn and Water of Ken are present throughout the Site and are within 200 m of the Proposed Varied Development layout. The baseline survey work recorded evidence of otter within the Site, but water vole was not considered to be present.

7.5.13. Given that the Site is within the regional range of water vole, it is possible that colonisation of the Site has occurred since the 2018 work was undertaken. Water vole mitigation guidelines by Dean et al (2016), which are typically treated as industry standard guidance, state that water vole survey should be completed in both the spring and the later summer / early autumn.

7.5.14. All burns within 200 m of proposed turbines and infrastructure will be surveyed in spring and summer 2024. Surveys will involve walking along burnsides to search for evidence of otter (such as spraints, holts or feeding remains) and water vole (such as latrines, burrows and feeding signs.

Pine Marten and Red Squirrel Surveys

7.5.15. No conclusive evidence for red squirrel and pine marten was found during the 2018 baseline survey work. However, the Site was considered (in the EIA Report) to be suitable to support both species.

7.5.16. Survey work will focus on suitable habitat likely to support the species which will be the mature coniferous plantation on-site. The Phase 1 survey will involve an initial assessment of habitat quality for pine marten and red squirrel (in accordance with NatureScot guidance and Cresswell et al. 2012) in this area. A more thorough walkover survey targeting habitats suitable such for both species such as scrub, trees, crags and boulders will then be completed.

7.5.17. The walkover surveys will follow industry best practice guidance for both pine marten and red squirrel and will take place over five days between April and August 2024 by an experienced surveyor. The walkovers will be supplemented by deployment of trail cameras (as recommended in NatureScot guidance) at suitable locations identified during the walkover (such as possible drey and den sites, near field signs, burn sides, rocky habitats and rabbit warrens).

Fisheries Survey

7.5.18. The findings of the 2018 survey data indicated that the watercourses are not accessible to migratory salmonids and that the existing fish population is in decline possibly due to the presence of signal crayfish. Therefore, fisheries surveys are not considered to be required to support the s36C Application. However, engagement is proposed with the Dumfries and Galloway Fisheries Trust to confirm fisheries surveys are not required and ensure the proposed approach is not challenged at submission.

Other Species

7.5.19. It is not considered, at this stage, that surveys for other species are likely to be required to inform the s36C Application. The suitability of the Site to support species such as badger will be assessed as part of the Phase 1, and additional surveys will be undertaken if necessary.

7.5.20. NatureScot guidance does not currently recommend surveys for reptiles or invertebrates in connection with wind farm proposals. Freshwater pearl mussel were not considered in the EIA Report; however, the desk study data will be reviewed (along with likely impacts on watercourses) to determine whether this species should be considered further.

Abnormal Load Route

7.5.21. As with the Consented Development, a number of off-site road improvements will be required for the Proposed Varied Development, primarily along the B729 between Cairsphairn and the Site access. The works are required to facilitate the transportation of the larger turbine parts and will largely comprise over-sail and over-run areas. The impacts of the enabling works are not fully understood at this time, as such an environmental appraisal of the habitats present, potential impacts and mitigation measures will be provided in a further appendix to the EIA Report.

7.6. Existing Planning Conditions

7.6.1. The planning conditions imposed on the Consented Development that are relevant to ecology include:

- 12. Site decommissioning, restoration and aftercare;
- 14. Ecological clerk of works;
- 18. Construction environmental management plan;
- 19. Construction hours and timing:
- 24. Biodiversity plan: and,
- 30. Breeding bird protection plan.

7.7. Potential Impacts

7.7.1. The change in design between the Consented Development and the Variation Development is unlikely to produce a significantly different impact on non-avian ecological receptors. The proposed reduction in the number of turbines from 17 to 13 is likely to result in a reduced level of impact on ecological receptors. The change in location of turbines 2, 3 and 7 is likely to not be significant as the proposed new locations are within the same habitat types as the Consented Development locations.

7.7.2. Considering the proposed changes to the design layout within the Variation Development there are unlikely to be significant differences in type or magnitude of impacts from the Consented Development. Therefore, the planning conditions imposed under the Consented Development remain proportionate and appropriate for the Variation Development.

7.7.3. The original EIA Report (Infinergy, 2018) did not identify any significant effects in terms of EIA Regulations, for the Consented Development, on habitats or non-avian species.

7.7.4. The Site has been managed in the same way in the intervening years and therefore no significant deviation from the baseline data gathered in 2018 is anticipated.

7.8. Proposed Mitigation and Enhancement

7.8.1. The 2018 EIA assessment did not identify potential significant effects (in terms of the EIA Regulations) on any receptors, even in the absence of mitigation, during the construction, operation and decommissioning of the Consented Development.

7.8.2. Through applying effective embedded mitigation measures, as a result of the design and following best practice guidelines during construction, the magnitude of residual effects of the Consented Development both alone and in combination with other schemes was assessed as being negligible, and thus non-significant in terms of the EIA Regulations.

7.8.3. Proposed embedded mitigation/ good practice measures as detailed in Section 9.8 of the EIA Report (Infinergy, 2018), particularly to ensure the safeguarding of protected species during construction, include, but may not be limited to:

- Ecological Clerk of Works (ECoW): An ECoW will be appointed to provide ecological and environmental advice during works, including the monitoring of environmental compliance; and
- Pre-Construction Protected Species Survey: Surveys will be undertaken ahead of works taking place within the working areas and appropriate buffers, to identify changes in the baseline condition for protected species (including those not considered to be Important Ecological Features (IEFs), to ensure all species are sufficiently safeguarded and works are complaint with protected species legislation.

7.8.4. Proposed enhancement measures were limited within the Consented Development documents. The NPF4 and specifically Policy 3 looks to provide integrated nature based solutions including restoring habitats on Site that have been degraded through historic management practices, provide habitat enhancements for poor or moderate condition habitats while building and strengthening nature networks and the connections between them. Informed by the Consented Development reports these measures could include restoration of the blanket mire/bog habitats in the north west of the Site, as well as improving and enhancing the condition of grassland and heathland habitats found along the forestry tracks and rides. Additionally, the turbine key hole areas could be managed to improve the habitat types present and increase the total area of priority habitats present on Site.

7.8.5. Provision for priority species present on Site or in the surrounding areas will be made in the form of habitat enhancement and the provision of roosting or nesting opportunities as appropriate.

7.8.6. Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be avoided where possible and minimised through careful planning and design.

7.9. Receptors and Impacts Scoped In or Out of Assessment

7.9.1. The original EIA (Infinergy, 2018) identified no significant effects on ecological receptors as a result of the Consented Development. The management of the Site has remained unchanged in the intervening period. It is therefore unlikely that there have been significant changes to the baseline conditions, as such the Site likely retains potential to support the following species, which will be scoped into the Assessment:

- Habitats of principal importance,
- Bats,
- Otter,
- Water vole,
- Pine marten, and
- Red squirrel.

7.9.2. Based on the information available the Site is unlikely to support migratory salmonids. As such these ecological receptors have been scoped out of the assessment, subject to consultation with the Dumfries and Galloway Fisheries Trust.

7.10. Scoping Questions to Consultees

7.10.1. It is proposed to consult with the following parties on approach to surveys for the Proposed Varied Development:

- Do the consultees agree with the proposed scope of the surveys?
- Are there any comments on the proposed survey areas or methodologies for species specific surveys?
- Do the consultees have any comments or queries on the 100 m micro siting areas of the turbines?
- Do the consultees agree that the Loch Ken and River Dee Marshes Special Protection Area and Ramsar can be scoped out of the EIA given the lack of connectivity?
- Do the consultees agree that the River Dee, Woodhall Loch, Laughenghie and Airie Hills and Airds of Kells Wood Special Sites of Scientific Interest can be scoped out of the EIA given the lack of connectivity?
- Do the consultees agree that migratory salmonids can be scoped out of the assessment?

8. Ornithology

8.1. Introduction

8.1.1. The 2018 Environmental Impact Assessment (2018 EIA) and 2019 Additional Environmental Information (2019 AEI I) both concluded that the Site was of low sensitivity for ornithological receptors and that there would be no significant effects as a result of the Consented Development.

8.1.2. In response to the 2018 EIA and 2019 AEI I, no objections were raised by NatureScot (formerly Scottish Natural Heritage) or RSPB Scotland in relation to ornithology. NatureScot agreed with the ornithology assessment that the Consented Development was predicted to have no significant effects on ornithology.

8.1.3. The Reporter, appointed by Scottish Ministers to hold an inquiry into the application under section 36 of the Electricity Act 1989, stated that "*With the applicant's clarifications on the assessment methodology, we are satisfied that RSPB Scotland's concerns over effects on black grouse have been addressed. We note that RSPB Scotland offered no further comments on the AEI. We find that proposed condition 31 on a Breeding Bird Protection Plan, requiring agreement from the planning authority, in consultation with NatureScot and RSPB, would minimise impacts on birds during the construction phase. We note NatureScot, as the Scottish Government's adviser on ornithology, finds no significant impacts. As a result, we are content that no further mitigation is required.*". The Scottish Ministers agreed with the Reporter's recommendations and consent of the Shepherd's Rig Wind Farm was granted subject to conditions in August 2023.

8.1.4. Since the variation to the Consented Development is limited to reducing the number of turbines and increasing rotor diameter and the blade tip height of turbines, all construction and decommissioning effects would be similar to those described within the 2018 EIA and 2019 AEI I. Despite changes to the position of three turbines, the extent of the wind farm and associated infrastructure remains the same, which in turn maintains the scale and magnitude of spatial effects. As such, the effects identified within the 2018 EIA and 2019 AEI I are predicted to remain non-significant and unchanged, and thus would be excluded from the s36C EIA.

8.1.5. As with the Consented Development, a number of off-site road improvements will be required, and these are assessed in an Abnormal Load Assessment appendix to the s36C EIA Report. Off-site roadworks would be limited in extent and located in areas of low ornithological value as identified by the ecology surveys. Furthermore, due to works being short-term in nature, there is no potential for significant effects on bird populations. Consequently, there is considered to be no potential for any adverse effect on regional populations of species of medium or high Nature Conservation Importance as a result of the off-site roadworks, including cumulative effects, and as such are scoped out of the s36C EIA.

8.1.6. The only aspect scoped into the assessment is the risk of birds colliding with turbine blades. The risk of collision mortality on birds may change, primarily as a result of the increased rotor diameter which increases the area of airspace swept by rotating blades. Given the low levels of target species flight activity recorded at the Site during baseline surveys, it is considered that any change in impact magnitude arising from the variation element will be minor. However, it is proposed that collision risk is re-assessed, and the previous collision risk modelling will therefore be updated to assess the change in risk as a result of increasing the size of turbines and reduction in the total number of turbines.

8.1.7. During baseline flight activity surveys to inform the Consented Development, flight height data was classified as <10 m, 10-30 m, 30-50 m, 50-100 m, 100-150 m or >150 m. As the Proposed Varied Development involves increasing rotor diameter and the blade tip height of turbines, further baseline field surveys were undertaken between April 2023 and March 2024 (providing 12 months flight activity data) classifying flight height as <20 m, 20-50 m, 50-100 m, 100-150 m, 150-200 m or >200 m.

8.2. Existing Baseline

Desk Study

8.2.1. A desk-based study has been undertaken to collate existing bird records/data. A literature search and review were carried out for the 2018 EIA in order to gain an insight into the ecology and behaviour of key species that could be affected by the now Consented Development. Nature conservation organisations were consulted (including SNH, RSPB, Dumfries and Galloway Raptor Study Group (DGRSG) and Dumfries and Galloway Environmental Resources Centre (DGERC)) in relation to species with a moderate or high nature conservation value. Results from the desk-based study have informed the field survey design. Distribution and abundance data were collected from the following published sources:

- NatureScot Sitelink (online information about designated sites);
- UK Biodiversity Action Plan (BAP);
- The Birds of Conservation Concern (BoCC) (Stanbury et al., 2021);
- International Union for the Conservation of Nature (IUCN, 2023) Red list of threatened species;
- Scottish Biodiversity List (Scottish Biodiversity Forum, 2013), and
- National Biodiversity Network (NBN) Gateway website (https://data.nbn.org.uk/).

Designated Sites

8.2.2. The Site is not located within or adjacent to any statutory sites designated for ornithological interest and there are no such sites within 10 km of the Site.

8.2.3. The only statutory designated site for ornithological interest within 20 km of the Site is the Loch Ken and River Dee Marshes Special Protection Area (SPA) which is situated c.13 km to the south and supports wintering populations of Greenland white-fronted goose (*Anser albifrons flavirostris*) and greylag goose (*Anser anser*).

8.2.4. Following current NatureScot guidance (SNH, 2016) on the connectivity of SPA populations with supporting habitats in the wider environment, despite being within 20 km of a goose SPA the Proposed Varied Development has no connectivity with the qualifying interests of the SPA (Mitchell, 2012).

8.2.5. As such, there are considered to be no SPAs that warrant further consideration within the s36C EIA, therefore they are scoped out of the assessment.

Baseline Surveys

8.2.6. Baseline field surveys for the Consented Development were carried out between October 2012 and August 2013, and April 2017 and March 2018. A detailed methodology and results for all surveys are provided in the 2018 EIA. A summary of the results is provided below.

- Geese and swans – no regular local or passage movements of geese or swans over the Site.
- Raptors – two active nests of red kites were recorded within 2 km of the Site in 2017. Breeding, within 2 km of the Site, was suspected for osprey in 2013 and goshawk in 2017; however, despite searches, no nest locations were found.
- Low levels of flight activity, gathered from over 530 hours of observation, were recorded for red kite, goshawk, osprey and hen harrier within 500 m of the Site.
- Black grouse – there was no evidence of lekking black grouse within the Site or survey area.
- Waders – breeding wader species, typical of the habitats present within 500 m of the Site, were present in very low numbers.
- Barn owl – one barn owl breeding site was confirmed during 2017, however this was at a distance greater than 2 km from the Site.
- Other species – the survey area supports a suite of breeding songbirds typically associated with upland moorland habitats and commercial conifer plantation in south-west Scotland.

8.2.7. As mentioned previously, as the baseline flight activity data did not record flight heights within the height bands proposed by the variation to the Consented Development it was felt that updated flight activity data was required to allow a robust assessment of collision risk to be made.

8.3. Guidance and Legislation

8.3.1. The EIA Report for the Proposed Varied Development will be carried out in line with relevant legislation and standards, as well as having due regard to the following guidance:

- Band, W., Madders, M., & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. & Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp. 259- 275. Quercus, Madrid.
- European Commission (2011) Wind energy developments and Natura 2000.
- NatureScot (SNH, 2016) Assessing connectivity with Special Protection Areas (SPAs).
- NatureScot (SNH, 2017) Recommended bird survey methods to inform impact assessment of onshore wind farms.
- NatureScot (SNH, 2018a) Assessing significance of impacts from onshore wind farms outwith designated areas.
- NatureScot (SNH, 2018b) Assessing the cumulative impacts of onshore wind farms on birds, and

8.4. Consultation

8.4.1. As part of the original application nature conservation organisations were consulted (including SNH, RSPB, DGRSG and DGERC in relation to bird species with a moderate or high nature conservation value. In response to the 2018 EIA and 2019 AEI I, no objections were raised by NatureScot or RSPB Scotland in relation to ornithology.

8.4.2. No further consultation has since been undertaken.

8.5. Updated Baseline

8.5.1. NatureScot guidance (SNH, 2017) was used for initial survey design. Flight activity surveys commenced within the Site and surrounding area in April 2023 and continued until end of March 2024 (providing 12 months of data).

Flight Activity Surveys

8.5.2. Information on bird flight activity was collected during timed watches from four strategic Vantage Points (VPs) using the methods described by Band *et al*. (2007). The Flight Activity Survey Area is defined by a polygon around the outermost turbines of the Scoping layout plus an additional 500 m strip around that polygon (**Figure 8.1**).

8.5.3. Vantage Points were selected through a mix of GIS analysis and field trials, with the aim of maximising ground visibility within the Site using the minimum number of points. Viewsheds are derived using a 20 m vertical cut-off and are truncated horizontally to 2 km (**Figure 8.2**).

8.5.4. During the period April 2023 to March 2024, 288 hours of observation was gathered. Watches from these VPs did not exceed three hours in length and were timed to ensure each vantage point has observations spread throughout daylight hours each month. A minimum of 36 hours of observation has been completed from each VP for each season, where between April and August is considered the breeding season (**Table 8.1**) and between September to March is the non-breeding season (**Table 8.2**).

Table 8.1 Summary of monthly Vantage Point observations during the breeding season. Data are in hours.

VP No.	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Total
2	9.00	9.00	6.00	6.00	6.00	36.00
3	9.00	9.00	6.00	6.00	6.00	36.00
5	9.00	9.00	6.00	6.00	6.00	36.00
6	9.00	9.00	6.00	6.00	6.00	36.00
Total	36.00	36.00	24.00	24.00	24.00	144.00

Table 8.2 Summary of monthly Vantage Point observations during the non-breeding season. Data are in hours.

VP No.	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Total
1	6.00	6.00	6.00	4.00	4.00	4.00	6.00	36.00
2	6.00	6.00	6.00	4.00	4.00	4.00	6.00	36.00
3	6.00	6.00	6.00	4.00	4.00	4.00	6.00	36.00
4	6.00	6.00	8.00	2.00	4.00	4.00	6.00	36.00
Total	24.00	24.00	26.00	14.00	16.00	16.00	24.00	144.00

8.6. Potential Impacts

8.6.1. Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high Nature Conservation Importance and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from the Proposed Varied Development. These include:

- Species listed on Annex 1 of European Council Directive 2009/147/EC on the conservation of wild birds (i.e. 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of SPAs in the wider area;
- Species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (i.e. 'Schedule 1' species); and
- Species of national conservation concern, not included within the above categories, but that are present within the study area in nationally or regionally important numbers (e.g. species on the UK Red List of Birds of Conservation Concern (Stanbury et al., 2021)).

8.6.2. Potentially significant effects which could result from the variation elements include the killing or injury of birds due to collision with rotating turbine blades. Flight activity by target species will be reviewed in relation to the revised turbine parameters and collision risk modelling will be undertaken.

8.7. Existing Planning Conditions

8.7.1. Annex 2 of the Shepherds' Rig Wind Farm (the Consented Development) Decision Letter outlines the Conditions attached to the Deemed Planning Permission. Condition 30 relates to ornithology, as follows:

30. Breeding Bird Protection Plan

(1) There shall be no Commencement of Development unless a breeding bird protection plan (BBPP) has been submitted to and approved in writing by The Planning Authority, in consultation with NatureScot and Royal Society for the Protection of Birds.

(2) The BBPP shall set out survey methods for the identification of sites used by protected and sensitive birds during construction and shall detail operational protocols to prevent or minimise disturbance of birds during construction of the Development.

(3) The BBPP approved under part (1) shall be implemented during construction works.

Reason: To minimise impacts on birds during the construction phase.

8.7.2. Since the variation to the Consented Development is limited to reducing the number of turbines and increasing rotor diameter and the blade tip height of turbines, all construction and decommissioning effects would be similar to those described within the 2018 EIA and 2019 AEI I. Despite changes to the position of three turbines, the extent of the wind farm and associated infrastructure remains the same. As such, it is anticipated that Condition 30 will remain appropriate.

8.7.3.

8.8. Assessment Methodology

8.8.1. The evaluation methodology will take account of best practice guidance (CIEEM, 2018). The assessment of the significance of predicted effects on ornithological receptors will be based on the 'value' or 'sensitivity' of a receptor and the predicted magnitude of change resulting from the proposed increase in rotor diameter and blade tip height, together with the reduction in total number of turbines.

8.8.2. In the event that the there is a predicted increase in collision risk that would be of sufficient magnitude to materially contribute to in-combination effects, a cumulative impact assessment will be undertaken.

8.8.3. An EIA Report chapter will be produced, which will focus on the potential for collision risk to bird species and committed mitigation measures will be specified where this is considered necessary.

8.9. Scoping Questions to Consultees

8.9.1. The following are what are thought to be the key issues which require consideration by the consultees:

- Do the consultees agree that the Loch Ken and River Dee Marshes Special Protection Area can be scoped out of the EIA given the lack of connectivity?
- Are the consultees content with and / or have any comments on the updated baseline survey methods and level of survey effort, taking into consideration current guidance, the proposed scale and location of the Proposed Varied Development?
- Do the consultees agree that collision risk is the only impact requiring detailed consideration within the EIA?

9. Cultural Heritage

9.1. Introduction

9.1.1. The cultural heritage chapter of the EIA Report for the Proposed Varied Development will characterise the historic environment within the Site and in the wider area. The cultural heritage of an area comprises archaeological sites, historic buildings, gardens and designed landscapes, historic battlefields and other sites, features or places in the landscape that have the capacity to provide information about past human activity, or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest may derive some, or all, of that interest from their setting within the wider landscape.

9.1.2. Direct and indirect physical effects involve alteration or destruction of the fabric of heritage assets and could result from the construction of turbine and crane bases, new or upgraded access tracks, substation, transformers, cables etc. Effects on the setting of heritage assets can arise due to the relative scale of turbines, their potential to detract from understanding of key views from/towards an asset, or a change resulting in an adverse experience of a heritage asset.

9.1.3. This chapter of the EIA Scoping Report is intended to identify likely significant effects of the Proposed Varied Development on the cultural significance of heritage assets within the Site through impacts upon their physical fabric. It also identifies likely significant effects on the cultural significance of heritage assets both within the Site and the wider landscape caused through development within their settings which would need detailed consideration in the EIA Report.

9.1.4. Consultation, desk-based research, field visits, a zone of theoretical visibility (ZTV) and setting visits will be used as necessary to define proportionate study areas for the assessment. A baseline of designated and non-designated heritage assets will be assembled to assess the potential direct, indirect, and setting effects of the Proposed Varied Development. Relevant data from Chapter 11 of the EIA Report (November 2018) and Chapter 11 of the AEI I Report (October 2019) submitted in support of the Consented Development will be identified and referenced where appropriate. Should likely significant effects be identified, measures for mitigation will be identified.

9.1.5. As part of this EIA Scoping Report, a data gap analysis and 'Stage 1' setting assessment has been carried out to identify whether it is likely that any additional heritage assets to those considered in the 2018 EIA and 2019 AEI I for the Consented Development may be affected as a result of the taller turbines and altered layout of the Proposed Varied Development. See **Appendix 9.1**.

9.1.6. Cultural significance is a quality that applies to all heritage assets and as defined by Historic Environment Scotland (HES) (NatureScot & HES 2018, Appendix 1 page 175), relates to the ways in which a heritage asset is valued both by specialists and the general public; it may derive from factors including the asset's fabric, setting, context and associations.

9.1.7. Cultural significance is assessed in relation to the criteria in Designation Policy and Selection Guidance (DPSG, HES 2019) Annexes 1-6, which are intended primarily to inform decisions regarding heritage designations but may also be applied more generally in identifying the 'characteristics' of a heritage asset, which contribute to its significance and should be protected, conserved and enhanced according to the NPF4 Policy Principles. DPSG Annex 1 is widely applicable in assessing the cultural significance of archaeological sites and monuments, for instance, while the criteria in Annex 2 can be used in defining the architectural or historic interest of buildings, whether listed or not. Cultural significance of assets is considered in terms described in DPSG Annex 1:

- Intrinsic Characteristics- those inherent in the monument i.e., "how the physical remains of a site or place contribute to our knowledge of the past";
- Contextual Characteristics – those relating to the monument's place in the landscape or in the body of existing knowledge i.e., "how a site or place relates to its surroundings and/or to our existing knowledge of the past"; and
- Associative Characteristics – subjective associations, including those with current or past aesthetic preferences i.e., "how a site or place relates to people, practices, events and/or historic and social movements".

9.1.8. To assess the significance of the effect of the Proposed Varied Development upon cultural heritage, the importance of each heritage asset is assessed against the potential magnitude of change upon its cultural significance using a reasoned matrix-style approach. This use of the word cultural 'significance', referring to the range of cultural values or interest attached to an asset, should not be confused with the unrelated usage in EIA where the 'significance of an effect' reflects the weight that should be attached to it in a planning decision.

9.1.9. Historic landscape is not treated as a heritage asset for the purposes of this assessment except where a defined area of landscape has been designated for its cultural heritage interest (such as Inventory of Gardens and Designed Landscapes). It is recognised that all landscapes have a historic dimension, and this will be considered as part of the assessment of Landscape Character (to be covered in the LVIA chapter of the EIA Report). Further, although any effects on the cultural significance and importance of heritage assets due to change in their setting are likely to be visual in nature, the assessment of these visual effects is distinct from the assessment of visual change in the LVIA. The assessment of effects on setting may be informed by visualisations prepared as part of the LVIA but the conclusions reached regarding visual change in the setting of a heritage asset are distinct.

9.2. Existing Baseline

9.2.1. The baseline information used for this EIA Scoping Report has been compiled using existing data on the historic environment:

- HES designations data available as Geographical Information Systems (GIS) datasets downloaded in March 2024;

- Liaison with Dumfries and Galloway Historic Environment Record (HER) (Pers. Comm. 12/04/24);
- National Record of the Historic Environment (NRHE) comprising the Canmore database, downloaded in March 2024;
- Chapter 11 of the Shepherds' Rig Wind Farm EIA Report (November 2018);
- Chapter 11 of the Shepherds' Rig Wind Farm AEI I Report (October 2019); and
- Shepherds' Rig Wind Farm AEI II Report (March 2021).

9.2.2. A data gap analysis for the purposes of the assessment of the Proposed Varied Development is provided below.

Site Boundary

Known Heritage Assets

9.2.3. Through desk-based assessment including consultation of National and Regional registers and field surveys, the 2018 EIA and 2019 AEI I, a total of 19 known heritage assets within the Site boundary have been identified. One of these is designated: Scheduled Monument SM2238 Craigengillan Cairn, a substantial prehistoric cairn situated on the eastern boundary of the Site. There are no further features considered to be of National importance within the Site. The remainder of the known assets within the Site are non-designated and considered to be of local to regional importance. These include numerous sheepfolds, enclosure and field systems as well as isolated examples of buildings and possible cairns. The 2018 EIA and 2019 AEI I also identified a network of dry-stone built field boundary walls within the Site (HA1).

9.2.4. Consultation with Dumfries and Galloway HER for this Scoping Report has identified one further heritage asset that has been added to the HER within the Site boundary since the previous EIA and AEI assessments were carried out. HA2 represents potential archaeological remains identified through LiDAR data.

9.2.5. The Dumfries and Galloway HER will be re-consulted as part of the EIA for the Proposed Varied Development for the most up-to-date dataset for the EIA. Further field surveys are not proposed as it is considered that the previous surveys for the Consented Development remain robust.

Archaeological Potential of the Site

9.2.6. The 2019 AEI I quoted the 2018 EIA Report which determined the level of archaeological potential within the Site as being low. Consultees did not raise concerns with this determination during consultation for the Consented Development and it is not considered necessary to revise this judgement for the EIA for the Proposed Varied Development.

Abnormal Load Route

9.2.7. A 10 m Study Area was agreed with the local authority archaeologist for Dumfries and Galloway along the B279 from Carsphairn to the entrance to the Shepherds' Rig Windfarm. The study area was defined to identify potential direct impacts upon heritage assets alongside the road as a result of required B729 Off-site Roadworks.

9.2.8. Through desk-based assessment including consultation of National and Regional registers and field surveys, the 2021 AEI identified a total of seven known non-designated heritage assets in the Abnormal Load Route study area, along with a network of dry-stone built field boundary walls lining the road at certain locations.

9.2.9. The Dumfries and Galloway HER will be re-consulted as part of the EIA for the Proposed Varied Development for the most up-to-date dataset for the EIA. Further field surveys are not proposed as it is considered that the previous surveys for the Consented Development remain robust.

Outer Study Area

9.2.10. The 2018 EIA considered heritage assets in a 10 km study area that may be affected by the Consented Development. Detailed consideration was given to assets within 5 km of the Site and to selected assets at greater distance in response to consultation with the Dumfries and Galloway Archaeologist.

9.2.11. In line with current guidance, heritage assets considered for operational effects of the Proposed Varied Development have been reassembled in a Gazetteer (**Appendix 9.1**) for the purposes of this Scoping Report as follows:

- Within 2 km of the proposed turbine locations, including within the Site boundary, there are two Scheduled Monuments, one Category B Listed Building, and three non-designated assets of National importance.
- Within 2-5 km of the proposed turbine locations there are three Scheduled Monuments and four Category B Listed Buildings.
- Within 5-10 km of the proposed turbine locations there are seven Scheduled Monuments and one Category A Listed Building.
- Within 10-20 km of the proposed turbine locations there are one Inventory Garden and Designed Landscape, 25 Scheduled Monuments, and 11 Category A Listed Buildings.

9.2.12. No heritage assets have been identified beyond 20 km that are likely to be affected by the Proposed Varied Development.

9.2.13. See below for the results of a renewed 'Stage 1' setting assessment carried out for the Proposed Varied Development.

Data Gap Analysis

New Designations

9.2.14. Within 20 km of the proposed turbine locations only one asset has been designated since 2018: Scheduled Monument SM13693 Bogton Loch airfield, 175m SSE of Buchan's Bridge, Dalmellington, located 17.8 km to the north-west of the Proposed Varied Development, was designated in 2019. This asset is located outwith the ZTV. Significant effects are unlikely, and the asset will not be considered further in the EIA for the Proposed Varied Development.

9.2.15. Consultation with Dumfries and Galloway HER for this EIA Scoping Report has confirmed that there are no additional non-designated heritage assets of likely National importance within the 2 km study area which are worthy of consideration in the EIA for the Proposed Varied Development.

Updated/Comparative Zone of Theoretical Visibility (ZTV)

9.2.16. A comparison between the ZTVs for the Consented Development and the Proposed Varied Development has been carried out to identify where any additional heritage assets may be affected where previously no impact was predicted. This includes consideration of:

- Heritage assets that may have been considered unlikely to be affected by the Consented Development as they formerly lay outwith the ZTV, but which may now lie within the ZTV for the Proposed Varied Development.
- Heritage assets within the ZTV for both the Consented Development and the Proposed Varied Development, for which no impact was predicted in the 2018 EIA Report, but which may be considered likely to be increasingly affected due to the taller scale of the turbines for the Proposed Varied Development.
- The 2018 EIA and 2019 AEI used a 10 km study area. Due to the taller turbines of the Proposed Varied Development and the according potential for adverse impacts upon cultural heritage over a wider area, designated heritage assets within a 10-20 km study area from proposed turbine locations are considered in this EIA Scoping Report.

9.2.17. One designated heritage asset is located within the ZTV for the Proposed Varied Development where previously it was not for the Consented Development: SM1118 Earlston Castle is located 8.3 km south of the Proposed Varied Development. Earlston Castle is a late 16th/early 17th century L-plan tower-house situated within a group of farm buildings which, although relatively modern in appearance, may contain older fabric. The tower house was not positioned strategically and although it was intended to be prominently visible, this sphere of influence was exerted over a local area only, with no relationship with the Site over 8 km to the north. Significant effects are unlikely, and the asset will not be considered further in the EIA for the Proposed Varied Development.

9.2.18. Other than the assets assessed in detail in the 2019 AEI I, no further heritage assets have been identified for which it is considered likely that the increased scale of the turbines of the Proposed Varied Development would result in an increased magnitude of impact to that previously assessed.

9.2.19. Within the 10-20 km study area Inventory Garden and Designed Landscape GDL00111 Craigengillan is located partially within the ZTV for the Proposed Varied Development, 16.7 km to the north-west. Craigengillan is a rare example of a complete and unfragmented estate landscape, started in the 16th century. The designed landscape dates from the late 18th/early 19th century and includes a Category A listed mansion house, and stables, formal gardens, a walled garden and a Japanese water garden, added in the early 20th century. Garden buildings and notable drystone walling, extensive policy woodland, a rocky gorge and industrial archaeological remnants are also elements of the designed landscape. None of the Listed Buildings within or associated with the Inventory Garden and Designed Landscape (GDL) are located within the ZTV for the Proposed Varied Development. The only parts of the GDL that are located within the ZTV are upland pasture, with no designed elements, providing context to the above-named built and designed landscape elements. A view of the Proposed Varied Development located on uplands over 16 km away would not impact upon the GDL's cultural significance, nor the Listed Buildings within it. Significant effects are unlikely and the asset will not be considered further in the EIA for the Proposed Varied Development.

9.2.20. Within the 10-20 km study area there is one Category A Listed Building located within the ZTV: LB3315 Ironmacannie Mill; this asset does not derive cultural significance through long-distance views and will not be considered further in the EIA for the Proposed Varied Development.

9.2.21. Within the 10-20 km study area there are six Scheduled Monuments located within the ZTV for the Proposed Varied Development, of which four are assessed as having a wider landscape which contributes to their significance, comprising one cairn (SM1047), two mottes (SM1109 & SM1117) and one castle mound (SM7743). These assets are all intended to be prominently visible or exert influence over a specific local area, however, over distances of over 10 km, in no case does visibility of the Proposed Varied Development contribute to these assets' cultural significance. Significant effects are unlikely and these assets will not be considered further in the EIA for the Proposed Varied Development.

Identification of Heritage Assets that may be Affected during the Operational Phase of the Proposed Varied Development ('Stage 1' Setting Assessment)

9.2.22. Potential impacts on the settings of heritage assets as a result of the Proposed Varied Development have been considered by following the approach set out in Managing Change in the Historic Environment: Setting (MCHE: Setting) (Historic Environment Scotland, 2016, updated 2020) and the Environmental Impact Assessment Handbook (Ver 5, NatureScot & HES, 2018, Appendix 1). The guidance set out in MCHE: Setting outlines three stages in assessing the impact of development on the setting of a heritage asset or place as follows:

"Stage 1: Identify the historic assets that might be affected by a development;

Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced; and

Stage 3: evaluate potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated".

9.2.23. The assessment methodology considers each heritage asset in the study area in turn to identify those heritage assets in the ZTV which have a wider landscape setting that contribute to their cultural significance and whether it is likely that cultural significance would be harmed by the Proposed Varied Development. Where heritage assets are located outwith the ZTV, viewpoints within the ZTV which may provide an important view towards the heritage asset and the Proposed Varied Development together have been considered.

9.2.24. The 2018 EIA considered heritage assets in a 10 km study area that may be affected by the Consented Development. Following submission of the 2018 EIA, wireframe and photowire visualisations were prepared to support the 2019 AEI I for 11 heritage assets, however during consultations, concerns were raised regarding the methodology employed in the assessment of operational effects in the 2018 EIA. The assessment of the 'Revised Development' in the 2019 AEI I therefore considered operational effects upon only three heritage assets which were agreed as those most likely to be affected. These comprised: two Scheduled Monuments (Craigengillan cairn, SM2238 and Stroanfreggan Craig, fort, SM1095) and non-designated heritage asset (Little Auchrae farmstead, MDG11404). All other operational effects were scoped out of the 2019 AEI I.

9.2.25. The Stage 1 setting assessment carried out for this Scoping Report (**Appendix 9.1**) agrees that these assets remain those most likely to be affected by a wind development on the Site therefore it is proposed these assets only are retained for detailed re-assessment in the EIA for the Proposed Varied Development.

9.3. Guidance and Legislation

9.3.1. It is proposed that the EIA Report for the Proposed Varied Development will be carried out with reference to the following legislation, policy and guidance:

Legislation:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997; and
- The Historic Environment Scotland Act 2014.

Policy:

- NPF4 Part 1 A National Spatial Strategy for Scotland 2045 and NPF4 Part 2 National Planning Policy (The Scottish Government, February 2023) Policy 7: Historic assets and places;
- Historic Environment Policy Scotland (HEPS) (HES, 2019); and
- Dumfries and Galloway Adopted Local Development Plan 2 (LDP2, 2019): Policy HE3 Archaeology.

Guidance:

- Historic Environment Scotland Circular (HES, 2019);
- Planning Advice Note (PAN) 2/2011: Planning and Archaeology (Scottish Government);
- IEMA/CIfA/IHBC Principles of Cultural Heritage Impact Assessment in the UK (2021);
- Designation Policy and Selection Guidance (DPSG), (HES 2019);
- Our Past, Our Future: The Strategy for Scotland's Historic Environment (HES 2023);
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2020);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2020);
- Managing Change in the Historic Environment (MCHE): Setting (Historic Environment Scotland (HES) 2016, updated 2020), and any other relevant MCHE guidance; and
- Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland (NatureScot and HES, 2018).

9.3.2. The cultural heritage chapter of the EIA Report will be prepared by Headland Archaeology. Headland Archaeology is a Registered Organisation with the Chartered Institute for Archaeologists (CIfA) and abides by its standards and codes of conduct. As part of the RSK Group, Headland Archaeology is formally recognised as an Historic Environment Service Provider (HESPR) with the Institute of Historic Building Conservation (IHBC), an externally audited status which confirms our work is carried out in accordance with the highest standards of the profession.

9.4. Consultation

9.4.1. On receipt of consultation responses following submission of the 2018 EIA Report, the Applicant considered matters raised and undertook further design and assessment work, reducing the previous 19 turbine layout to a 17 turbine layout, as considered in the 2019 AEI I. S36 consent was granted in August 2023 for the Consented Development, with a layout comprising 15(No.) turbines of 149.9 m height and 2(No.) turbines of 125 m height (numbers 1 & 3).

9.4.2. The 2018 EIA Report predicted significant (in EIA terms) operational effects, on the cultural significance of the Scheduled Monument Craigengillan Cairn (SM2238) and the non-designated Little Auchrae settlement (MDG11404, identified as being of National importance in the HER), caused through change to their settings. The significant effects related to views from these monuments in the direction of the valley of the Water of Ken. Consultation with HES (7th March 2019) also confirmed concerns relating to these views, as well as reciprocal views back towards the Site (and SM2238 specifically) from the valley.

9.4.3. HES also cited concerns relating to competition of proposed turbines with the current and intended dominance of SM1095 Stroanfreggan Craig Fort in northward views from the fort and also from the south towards the fort, particularly from the public road B729 and/or from the Southern Upland Way (*Ibid*.).

9.4.4. Mitigation embedded in the Consented Development resulted in the deletion of two turbines (T7 and T11) and the relocation of seven others (T4, T6, T8, T9, T10, T13, T16). The deletion of T7 and T11 and the relocation of T9 was agreed following consultation with HES in July 2019.

9.4.5. The Consented Development resulting from these embedded mitigation measures was reassessed in the 2019 AEI as reducing the operational effects upon SM2238 and MDG11404 to non-significant levels, and these were also considered to reduce the predicted operational effects on SM1095 to a negligible level. HES confirmed that based on the redesigns that they would drop their objection in relation to both SM2238 and SM1095.

9.4.6. The EIA Report for the Proposed Varied Development will consider whether these mitigation measures applied in the design of the Consented Development in relation to these specific heritage assets have been maintained in the varied proposal's layout and scale.

9.5. Study Areas

9.5.1. Overlapping study areas are proposed for the identification of heritage assets that may be affected by the Proposed Varied Development (see **Appendix 9.1**):

- Site boundary to identify potential direct and indirect (physical) impacts; and
- Outer Study Area (OSA) based on a bare earth ZTV to identify assets within and beyond the Site boundary that may be affected through development within their setting.

9.5.2. Within the OSA, assets have been included in the assessments presented in this EIA Scoping Report based on the level of importance assigned to the asset so as to ensure that all likely significant effects are recognised. The overlapping OSA reflects that the more important the asset is, the more likely that significant effects could be generated over further distances, as follows:

- Up to 20 km from proposed turbines: World Heritage Properties, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, and Scheduled Monuments;
- Up to 5 km from proposed turbines: Category B Listed Buildings, Conservation Areas, Non-Inventory Designed Landscapes (NIDL), and Inventory Historic Battlefields; and
- Up to 2 km from proposed turbines: Category C Listed Buildings, and non-designated heritage assets of National importance.

9.6. Assessment Methodology

Baseline

9.6.1. It is proposed that the baseline as presented in the 2018 EIA and 2019 AEI I and their supporting technical appendices, supplemented with an updated data request to the Dumfries and Galloway HER, will provide a robust basis for the impact assessment in the EIA for the Proposed Varied Development.

EIA Methodology

9.6.2. To assess the significance of the effect of the Proposed Varied Development upon cultural heritage, the importance of each heritage asset is assessed against the potential magnitude of change upon it using a reasoned matrix-style approach.

Importance of Receptor

9.6.3. The importance of a heritage asset is the overall value assigned to it based on its cultural significance, reflecting its statutory designation or, in the case of non-designated assets, the professional judgement of the assessor.

Table 9.1 Criteria for Assessing the Importance of Heritage Assets

Importance	Guideline Criteria
Very High	Assets valued at an international level, e.g. World Heritage Properties.

Importance	Guideline Criteria
High	Assets valued at national level, e.g. Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields, historic marine protected areas, some Conservation Areas and non-designated assets that meet the relevant criteria for designation in the opinion of the assessor. Category B or C-Listed Buildings where the existing designation does not adequately reflect their value, in the opinion of the assessor.
Medium	Assets valued at a regional level, e.g. Category B Listed Buildings, some Conservation Areas and non-designated assets of similar value in the opinion of the assessor. Category C-Listed Buildings where the existing designation does not adequately reflect their value, in the opinion of the assessor.
Low	Assets valued at a local level, e.g. Category C Listed Buildings, some Conservation Areas and non-designated assets of similar value in the opinion of the assessor.

9.6.4. Heritage Assets are defined as "*Features, buildings or places that provide physical evidence of past human activity identified as being of sufficient value to this and future generations to merit consideration in the planning system*" (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5, p.122). Thus, any feature which does not merit consideration in planning decisions due to its cultural significance may be said to have negligible heritage importance.

Magnitude of Impact

9.6.5. The magnitude of an impact is a measure of the degree to which the cultural significance of a heritage asset will potentially change as a result of the Proposed Varied Development (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5 Appendix 1, para 42).

9.6.6. Conclusions of the assessed magnitude of impacts is a product of the consideration of the elements of an asset and its setting that contribute to its cultural significance and the degree to which the Proposed Varied Development would change these contributing elements. The assessment therefore reflects the varying degrees of sensitivity of different assets to change brought about by different types of development.

9.6.7. This definition of magnitude and assessment methodology applies to likely effects resulting from change in the setting as well as likely physical effects on the fabric of an asset.

9.6.8. The magnitude of an impact resulting from change within setting is not a direct measure of the visual prominence, scale, proximity or other attributes of the Proposed Varied Development itself, or of the extent to which the setting itself is changed. Moreover, it is necessary to consider whether, and to what extent, the characteristics of the setting which would be changed contribute to the asset's cultural significance (NatureScot & HES 2018, Environmental Impact Assessment Handbook, v5 Appendix 1, paras 42 and 43).

Table 9.2 Criteria for Assessing the Magnitude of Impacts on Heritage Assets

Magnitude of Impact	Criteria
High Beneficial	Preservation of the asset in situ where it would be completely or almost completely lost in the do-nothing scenario.
Medium Beneficial	Changes to key elements of the asset's fabric or setting that result in its cultural significance being preserved, where they would otherwise be lost, or restored.
Low Beneficial	Changes that result in elements of the asset's fabric or setting that detract from its cultural significance being removed.
Negligible / No Impact	Changes to fabric or setting that leave significance unchanged.
Low Adverse	Changes to the elements of the fabric or setting of the heritage asset that contribute to its cultural significance such that this is slightly altered.
Medium Adverse	Changes to the elements of the fabric or setting of the heritage asset that contribute to its cultural significance such that this is substantially altered.
High Adverse	Changes to the fabric or setting of a heritage asset resulting in the complete or near complete loss of its cultural significance, such that it may no longer be considered a heritage asset.

Significance of Effect

9.6.9. The significance of an effect ('EIA significance') on the cultural significance of a heritage asset, resulting from a direct or indirect physical effect or an effect on its setting is assessed by combining the magnitude of the impact and the importance of the heritage asset.

Table 9.3 Criteria for Assessing the Significance of Effects on Heritage Assets

Importance of Heritage Asset	Magnitude of Impact upon Cultural Significance			
	High	**Medium**	**Low**	**Negligible/No Impact**
Very High	**Major**	**Major**	**Moderate**	Negligible/No Effect
High	**Major**	**Moderate**	Minor	Negligible/No Effect

Importance of Heritage Asset	Magnitude of Impact upon Cultural Significant			
	High	Medium	Low	Negligible/No Impact
Medium	**Moderate**	Minor	Minor	Negligible/ No Effect
Low	Minor	Minor	Negligible	Negligible/No Effect

9.6.10. Effect significance conclusions are expressed in the impact assessment as 'Beneficial' or 'Adverse'.

- Beneficial effects are those that preserve, enhance, or better reveal the cultural significance or special interest of heritage assets.
- Adverse effects are those that detract from or reduce cultural significance or special interest of heritage assets.

9.6.11. Major and Moderate effects are regarded as 'significant' in EIA terms, while Minor and Negligible effects are 'not significant'.

9.6.12. In all cases conclusions will also be expressed in terms of the relevant Policy tests.

9.7. Existing Planning Conditions

9.7.1. Annex 2 of the Shepherds' Rig Wind Farm (the Consented Development) Decision Letter outlines the Conditions attached to the Deemed Planning Permission. Condition 26 relates to archaeology and cultural heritage, as follows:

26. Archaeology

(1) There shall be no Commencement of Development unless the Company has secured the full implementation of a programme of archaeological work in accordance with a Written Scheme of Investigation (WSI) which has been submitted to and approved in writing by the Planning Authority.

(2) This written scheme shall include the following components:

a) an archaeological evaluation to be undertaken in accordance with the agreed WSI; b) an archaeological recording programme, the scope of which will be dependent upon the results of the evaluation and will be in accordance with the agreed WSI; and c) the programme of archaeological work will include a scheme of forest felling and replanting in the vicinity of Craigengillan Cairn as described in paragraph 11.7.6 of the AEI and shown on AEI Figure 11.14.

Reason: To protect and/or record features of archaeological importance on this site.

9.7.2. As the turbine positions and associated internal infrastructure is largely unchanged with the exception of some turbines being removed from the layout, it is likely that the Proposed Varied Development will have similar direct (physical) impacts as those identified for the Consented Development upon both known heritage assets (comprising impacts only upon HA1 post-medieval – modern period dry-stone built field boundary walls) and also the potential for hitherto unknown archaeological remains (assessed in the 2018 EIA and 2019 AEI I as 'low' potential), and to include potential impacts along the Abnormal Load Route which may also require fieldwork mitigation. Consultation with the Dumfries and Galloway HER has indicated the potential presence of one additional heritage asset within the Site and the impact assessment will be repeated for the Proposed Varied Development. It is anticipated that Condition 26 will remain appropriate to mitigate any identified effects.

9.7.3. Given that the Proposed Varied Development will remain visible from SM2238, the conditioned scheme of forest felling and replanting in the vicinity of Craigengillan Cairn as described in paragraph 11.7.6 of the 2019 AEI and shown on AEI Figure 11.14 is considered likely to remain appropriate to enhance the setting of the Scheduled Monument.

9.8. Proposed Mitigation

Primary Mitigation

9.8.1. Data from desk-based and site-based sources will be gathered using GIS and the cultural heritage team will work throughout the EIA process with colleagues and consultees to understand potential effects, and provide input into design to address them. Project design will consider likely significant effects of the Proposed Varied Development on the cultural significance of any heritage assets in the OSA caused through change to setting.

Additional (Secondary and Tertiary) Mitigation

9.8.2. Onshore wind energy project infrastructure typically has a relatively small footprint compared to the overall Site boundary with scope for micro siting to avoid direct physical impacts to archaeological remains during construction.

9.8.3. Precautionary measures such as fencing off heritage assets during construction works may be employed to avoid accidental impacts.

9.8.4. Where potential direct effects are identified, evaluation methodologies may be employed (such as intrusive works) to better understand the extent and cultural significance of archaeological remains. Adverse effects may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation (per NPF4 Policy 7 Historic assets and places criterion (o) and PAN2/2011 Planning and Archaeology, sections 25-27).

9.8.5. As detailed in the 2019 AEI I and summarised above, forest felling and replanting in the vicinity of heritage assets to enhance their setting may also be considered.

9.9. Potential Impacts

9.9.1. Based on the baseline information and assessments presented in this EIA Scoping Report, it is considered that the potential effects that are to be assessed for the Proposed Varied Development as well as its conclusions are unlikely to differ significantly from those of the Consented Development.

9.9.2. Significant effects are therefore not anticipated as a result of the Proposed Varied Development.

9.9.3. To assess the effect of the Proposed Varied Development upon cultural heritage, the significance of any effect is calculated through comparison of the importance of each heritage asset against the potential magnitude of change upon it. Effects on cultural heritage can arise through direct physical effects, indirect effects, or effects on setting, including cumulative effects:

- Direct physical effects describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and will only occur within the Site.
- Indirect effects describe secondary processes, triggered by the Proposed Varied Development, that lead to the degradation or preservation of heritage assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.
- An effect on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (positively or negatively) the cultural significance of that asset. Visual effects are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Effects may be encountered at all stages in the life cycle of a development from construction to decommissioning, but they are only likely to lead to significant effects during the prolonged operational phase of the Proposed Varied Development.
- Effects from cumulative developments will also be considered. Cumulative impacts can relate to the physical fabric or setting of assets. They may arise as a result of impact interactions, either of different impacts of the proposal itself, or additive impacts resulting from incremental changes caused by the proposal together with other projects already in the planning system or allocated in a Local Development Plan.

9.9.4. Given that the turbine positions and associated internal infrastructure of the Proposed Varied Development is largely unchanged from the layout of the Consented Development, it is anticipated that direct (physical) impacts will be the same as previously assessed: i.e. breaches required through HA1 post-medieval – modern period dry-stone built field boundary walls at four separate locations for the construction of internal access tracks.

9.9.5. In terms of operational effects, the Proposed Varied Development consists of a smaller number (13 turbines) of taller turbines than the Consented Development (17 turbines). From an initial review of wireframe visualisations, although taller in scale, it is anticipated that the Proposed Varied Development would result in a less 'cluttered' landscape than the Consented Development, with a more open aspect in views from heritage assets such as SM2238 Craigengillan Cairn, SM1095 Stroanfreggan Craig, fort, and MDG11404 Little Auchrae farmstead.

Archaeological Potential

9.9.6. Likely significant effects upon unknown heritage assets will be discussed in the EIA Report for the Proposed Varied Development in terms of the risk that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the Proposed Varied Development as a whole.

9.9.7. It is agreed through previous submissions and consultation that the potential for discovery or impact upon important archaeological remains within the Site during construction is low and mitigation measures have been outlined by condition 26 for the Consented Development for the identification and recording of any hitherto unknown heritage assets that may be physically impacted.

Abnormal Load Route

9.9.8. An updated assessment of potential impacts on access improvements along the B729 (originally submitted as part of the 2021 AEI II) will also be carried out in the EIA for the Proposed Varied Development, based on the results of an updated swept path analysis required due to the larger abnormal indivisible loads associated with the proposed taller turbines.

9.10. Receptors and Impacts Scoped In or Out of Assessment

Potential Effects Scoped In

9.10.1. Based on the existing understanding of baseline conditions it is proposed that the following aspects of EIA are scoped into the assessment for the Proposed Varied Development:

- Given that the Dumfries and Galloway HER has confirmed that there are potentially additional known heritage assets within the Site boundary that where not considered in the 2018 EIA or 2019 AEI I, it is proposed to scope in the re-assessment of potential direct/indirect construction-phase physical impacts.
- It is proposed to scope in the re-assessment of operational effects, including cumulative effects, only for those heritage assets identified through previous consultation and presented in the 2019 AEI I and as justified in this Scoping Report as being sensitive to setting change within the Outer Study Area, specifically:
  - Scheduled Monument SM2238 Craigengillan Cairn.
  - Scheduled Monument SM1095 Stroanfreggan Craig, fort.
  - Non-designated heritage asset of National importance MDG11404 Little Auchrae farmstead.

9.10.2. Consideration will be given to the likelihood that these heritage assets, upon which residual effects were predicted in the 2019 AEII, could experience an increased magnitude of impact as a result of the Proposed Varied Development.

Potential Effects Scoped Out

9.10.3. It is proposed that the following aspects of the EIA are scoped out of the assessment for the Proposed Varied Development:

- A Site walkover and reassessment of aerial photos and historic mapping for the Site boundary and Abnormal Load Route is not proposed as this was fully considered in the 2018 EIA Cultural Heritage Chapter 11 and subsequent AEIs and is unlikely to result in significant new findings.
- Construction phase setting effects would be temporary and are not considered to be significant in EIA due to their very short duration. Construction phase setting effects are therefore proposed to be scoped out of the assessment.
- It is proposed that re-assessment of all heritage assets in the OSA considered for operational effects in the 2018 EIA for which no significant impact was identified are scoped out of the EIA for the Proposed Varied Development as the previous assessment conclusions did not relate to the scale of the turbines proposed, and the principle of a wind farm on the Site of the Consented Development/Proposed Varied Development is accepted as unlikely to result in effects upon the cultural significance of these assets. Similarly, none of the non-designated heritage assets located within the Site boundary or 2 km OSA are identified as having a wider landscape component that contributes to their cultural significance, and the Dumfries and Galloway HER has confirmed there are no new non-designated assets of National importance that may be affected by the Proposed Varied Development. It is proposed, as agreed during the previous assessment presented in the 2019 AEI I, that assessment of operational effects associated with the Proposed Varied Development therefore focuses only on those three assets listed above (Potential Effects Scoped In).

- The extent of ground disturbance associated with decommissioning of the Proposed Varied Development will not extend beyond the construction footprint and so decommissioning effects on heritage assets within the Site boundary will not occur. Any residual operational phase setting effects will be reversed. Decommissioning effects are therefore proposed to be scoped out of the assessment.

9.11. Scoping Questions to Consultees

- Do consultees agree with the proposals for 'Potential Effects Scoped In' and 'Potential Effects Scoped Out' in this Scoping Report?
- Do consultees agree with the three heritage assets proposed for detailed setting assessment in the EIA Report for the Proposed Varied Development (Scheduled Monument SM2238 Craigengillan Cairn; Scheduled Monument SM1095 Stroanfreggan Craig, fort; Non-designated heritage asset of National importance MDG11404 Little Auchrae farmstead), or would they wish to request any further specific heritage assets to be assessed?

10. Geology and Peat

10.1. Introduction

10.1.1. This section considers the potential effects of the Proposed Varied Development on the geology and peat of the study area. It includes a baseline description of the existing conditions, followed by the proposed assessment method for determining the potential effects to be addressed in the EIA Report chapter.

10.2. Existing Baseline

10.2.1. The baseline information used to inform the EIA Report (November 2018) has been reviewed and any conditions that have changed are outlined below. The area assessed to inform the baseline includes the proposed application boundary plus a buffer zone of 2 km around the application boundary.

Geology

10.2.2. The bedrock underlying the entire Site is Portpatrick Formation Wacke – a sandstone with a clay matrix. The bedrock is only interrupted in north of the Site, west of Craigengillan, by a single 1200 m x 30 m dyke comprising of microdiorite and porphyritic rocks. A geological fault is also recorded within the southern Site area, orientated south-west to north-east within Muirdochwood.

10.2.3. British Geological Survey (BGS) superficial mapping indicates that peat is present along the north-west boundary, in the centre south of the Site and on the southern boundary. Glacial till is generally present in the eastern half of the Site and there are areas of glaciofluvial deposits in the north and south-west.

Soils

10.2.4. The 1:250,000 National Soil Map of Scotland shows that peat is present in the north-west of the Site, with Peaty podzols in the centre-north and in the south-west. The remainder of the Site has Peaty gleys.

Peat

10.2.5. The SNH Carbon and Peatlands 2016 mapping shows several different classes of peatland across the Site. Class 5 (peat soil with no peatland vegetation) is shown on the majority of the Site and Class 1 (nationally important carbon-rich soils, deep peat and priority peatland habitats) is present on the north-west boundary. Further south along the west boundary, there are localised areas of Class 2 (Peatland or areas with high potential to be restored to peatland) and Class 3 (Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type) peat.

10.2.6. There was an initial phase of peat probing undertaken in 2013 on a 100m grid which covered some of the northern part of the Site. Further probing was completed in 2018 following the initial design freeze. The probing included 50 m spacing with offset probes along proposed tracks with higher density probing at turbine locations.

10.2.7. The peat survey resulted in 1,293 probes across the study area with substantial areas of no peat and pockets of peat up to 4 m in depth along the western boundary and in the central part of the southern area of the Site.

10.2.8. A peat slide risk assessment was conducted on the previous data and layout which indicated negligible risk across the whole Site with the exception of an area of low risk on the western boundary.

Designated Sites

10.2.9. The Site is located within the Galloway and Southern Ayrshire Biosphere Reserve which is designated for the promotion of conservation of biodiversity with sustainable use.

10.2.10. The Loch Dungeon Geological Conservation Review Site is located 11.4 km from the Site and is designated for Pollen and plant macrofossils from the sediments of Loch Dungeon.

10.3. Guidance and Legislation

10.3.1. The main guidance and legislation that will be used to inform the assessment includes:

Legislation:

- The Environmental Protection Act 1990, as amended; and
- The Pollution Prevention and Control (Scotland) Regulations 2012.

Policy:

- Scottish Government's National Planning Framework 4 (NPF4); and
- Scottish Government's Planning Advice Notes (PAN) with particular reference to: PAN 51: planning, environmental protection and regulation.

Guidance:

- The Scottish Government, Scottish Natural Heritage (SNH) & Scottish Environment Protection Agency (SEPA)'s Guidance on Developments on Peatland (2017);
- Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (Second Edition). Scottish Government; and
- Scottish Renewables, NatureScot, SEPA & Forestry Commission Scotland (FCS)'s Good practice during Wind Farm Construction Guidance (2019).

10.4. Consultation

10.4.1. No formal consultation has been undertaken with regards to geology and peat for the Proposed Varied Development at this stage. However, consultations will be carried out with the following stakeholders and organisations:

- SEPA in relation to peat;
- NatureScot in relation to peatland habitats; and
- The forest agent/landowner in relation to felling plans and compatibility of any peatland restoration measures.

10.4.2. In response to the Consented Development s36 application, the following consultation responses were received:

- Consultation was undertaken in December 2018 with SEPA, Scottish Water, and Ironside Farrar (Scottish Government advisor on peat landslide matters) for the Consented Development. Public inquiry sessions were undertaken during November 2021 which also included unaccompanied inspections of the Site.

10.4.3. Two objections within the scope of Geology and Peat were raised for the Consented Development:

- SEPA originally objected to the Consented Development due to the lack of information on the impact on peat, however the objection was withdrawn after the turbine locations were adjusted away from peat.
- Ironside Farrar advised that the methodology of the peat landslide hazard risk assessment presented in Appendix 12 of the EIA Report needed revision in a number of areas, including the integration of desk and field surveys, the calculations of risk and the proposed mitigation measures. It was recommended that a revised report be submitted. Following the updated risk assessment, Appendix 12 of the October 2019 AEI, Ironside Farrar confirmed that the Applicant had generally addressed the queries raised at Stage 1, with the exception of one point on scoring which was not considered to affect the outcome of the risk assessment.

10.5. Study Area

10.5.1. The Study Area will include the Site plus a buffer zone of 2 km. For hydrological receptors, impacts downstream up to 5 km from the Site will also be considered, as impacts such as pollution events can be transmitted downstream for greater distances.

10.6. Assessment Methodology

Desk Based Study

10.6.1. The assessment will include a review of publicly available material relating to the Geology and Peat located within the Site boundary. The information reviewed has been compared to the initial assessment and any variations in results have been described above. The following data sources were reviewed:

- National Soil Map of Scotland;
- Carbon and Peatland 2016 Map;
- British Geological Survey Geoindex – Superficial Soils; and
- British Geological Survey Geoindex – Solid Geology.

Site Surveys

10.6.2. Further high-density peat depth surveys will be undertaken within the Site in areas where the proposed infrastructure has changed from that of the Consented Development and to infill previous probing on the Consented Development where it is not in accordance with relevant guidance, Guidance on Developments on Peatland: Peatland Survey (2017). A 10 m probing grid will be completed across the excavation footprint of proposed infrastructure and a 20 m grid in a buffer area to inform micro-siting of the layout in order to avoid peat, if possible, with particular emphasis on avoidance of peat >1 m and unmodified peat (near natural). Peat depths will be verified with coring which will also allow the characteristics of the peat to be assessed and to inform the updated peat restoration plan.

10.6.3. There are opportunities for peat restoration to be completed incorporating forest-to-bog restoration through ground smoothing or bunding (using excavated peat), extension of felling to remove non windfirm trees to expand the open area, and restoration of eroded or drained areas of peat such as those found in the numerous forestry rides. Much of this would be dependent on peat depth and habitat condition and would involve collaboration with the ecology and ornithology teams and the forestry consultant.

10.6.4. A geomorphological walkover will be completed following the completion of a site geomorphological map. The potential for peat landslides in association with construction will be assessed for the Proposed Varied Development, in line with Scottish Government (2017) Best Practice Guidance. Natural and construction induced peat landslide likelihood will be assessed and potential impacts on-site and site-adjacent receptors will be assessed to enable calculation of risk. Appropriate mitigation will be specified to minimise any identified risks.

Impact Assessment

10.6.5. The assessment will be undertaken through standard EIA methodology with the sensitivity of the receptor, magnitude of the potential effect, and likelihood of the effect being determined and then using the specified matrix to determine the significance of effect on specific receptors.

Sensitivity of Receptor

10.6.6. The sensitivity of a receptor will depend on its use, status, and level of designation. A receptor such as Class 1 carbon-rich soils or a watercourse supplying a private water supply (PWS) or containing Atlantic salmon would have a high sensitivity. Other receptors such as waterbodies that do not support designated species, water supplies or are of high value will have a lower sensitivity.

10.6.7. The sensitivity of the receptors will include the following (hydrological receptors are included as peat slide has the potential to impact on various hydrological receptors):

Table 10.1 – Sensitivity of Receptors

Value	Description
Very High	Private water supply abstraction for human or stock consumption (surface water or groundwater). Public drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'high' (or equivalent older chemical or biological monitoring designation). Watercourse designated under the Freshwater Fish Directive or known to have fish spawning grounds. Internationally or nationally designated sites (e.g., Ramsar, SPA, SAC, SSSI, National Nature Reserves, Marine Nature Reserves). Habitats listed in Regional Biodiversity Action Plans or Annex I habitats. Internationally important species sensitive to hydrological change.
High	Private water supply abstraction not for human or stock consumption (surface water or groundwater). Public non-drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'good' (or equivalent older chemical or biological monitoring designation). Watercourse known to support important fishery population. Sites designated at a regional level. Unmodified peatland >1m in depth. Other water dependent habitats.
Medium	Surface water classified under the WFD as 'moderate' (or equivalent older chemical or biological monitoring designation). Sites designated at a local level. Modified peatland >1m in depth or peatland <1.0m in depth.
Low	Surface water classified under the WFD as 'poor or bad' (or equivalent older chemical or biological monitoring designation). No private or public supply abstractions (surface water or groundwater). No peat or peaty/organic rich soils less than 0.5m in depth. No designated fisheries.

Magnitude of Impact

10.6.8. The magnitude of the impact is a measure of the degree that the potential effect could manifest on the receptors. For example, excavation of deep peat has a high magnitude of impact.

Likelihood of effect

10.6.9. The likelihood of the effect will be assessed to determine the probability that a receptor would be impacted by the Proposed Varied Development. This may be related to parameters such as distance from the source, likelihood of a connecting pathway or likely extent of disturbance.

Significance of Effect

10.6.10. The significance of the effect is calculated by a combination of the levels assigned for each parameter listed above. Significant effects are classified as those that are Moderate or above and will require mitigation measures to be employed above the standard good practice methods.

Abnormal Load Route

10.6.11. An updated assessment of potential impacts on access improvements along the B729 (originally submitted as part of the 2021 AEI II) will also be carried out in the EIA for the Proposed Varied Development, based on the results of an updated swept path analysis required due to the larger abnormal indivisible loads associated with the proposed taller turbines. Any potential for impacts associated with the off-site road works on geology and peat will be considered in an appendix to the EIA Report.

10.7. Existing Planning Conditions

10.7.1. Condition 12 of the ECU decision letter for the Consented Development, dated August 2023, concerns site decommissioning, restoration and aftercare. Point (2) states *'No development shall commence unless and until a decommissioning, restoration and aftercare strategy has been submitted to, and approved in writing by, the Planning Authority, in consultation with NatureScot and SEPA'*. The development of a Peat Management Plan (PMP) will be undertaken, which will include proposed peat restoration areas during construction and restoration opportunities at the point of decommissioning.

10.7.2. The PMP will also satisfy Condition 15 (b) regarding micro-siting. The condition states that '*no micro-siting shall take place to a position where: i) the peat depth is greater than the location shown on AEI, Figure 4.1; and ii) the peat depth at the proposed new location is more than 1.5 m, without the prior written approval of the Planning Authority*'

10.7.3. Condition 18 of the decision letter states that '*There shall be no Commencement of Development unless a Construction and Environment Management Plan (CEMP) has been submitted to and approved in writing by the Planning Authority, in consultation with NatureScot, HES, SEPA, the roads authority and the council's Environmental Health Officer (EHO)'.* It is likely that this condition will remain applicable to the Proposed Varied Development.

10.7.4. Condition 23 states *'Floating roads shall be installed in areas where peat depths are in excess of 1 metre.'* Detailed peat probing will be completed to enable avoidance of peat > 1 m wherever possible, however where avoidance is not feasible floating track will be used.

10.7.5. Condition 24 states '*There shall be no Commencement of Development unless a Biodiversity Plan setting out proposals for the monitoring, restoration, enhancement and management of the peatland habitat of the site during construction, operation and decommissioning, has been submitted to and approved in writing by the Planning Authority.'.* An updated Peat Management Plan and outline Biodiversity Enhancement Management Plan will also be developed to present the restoration opportunities at the Site.

10.8. Proposed Mitigation

10.8.1. Micro-siting of infrastructure on peat and particularly on peat > 1 m to reduce the disturbance of the peat and avoid carbon loss as well as reducing the risk of pollution.

10.8.2. Where avoidance of peat is not possible the layout will be adjusted to avoid the highest quality and deepest peat. Any excavated peat will preferentially be used on-site with any higher quality peat used in peat restoration areas where the peat can be directly translocated without the need for storage. Any degraded peat will be used for temporary infrastructure reinstatement where appropriate. Felled areas that will not be restocked will be restored to peat bog wherever possible.

10.8.3. Micro-siting of infrastructure in areas deemed to be at risk of peat slide where possible.

10.8.4. Peat slide risks may require additional mitigation measures to be employed, such as the installation of catch-fences as a precaution against runout into sensitive watercourses and the preparation of a geotechnical risk register providing explicit mitigation measures tailored to location with elevated risk.

10.9. Potential Impacts

10.9.1. The potential impacts will not differ from those of the Consented Development.

10.9.2. Although the infrastructure will be located to avoid peat as far as is possible, there may be a disturbance to the peat and peaty soils on the Site. This would mainly be along the western boundary of the Site, although other currently unidentified pockets may also be located during detailed surveying.

10.9.3. Areas of potential peat slide risk will be avoided as far as possible. The assessment will be informed by detailed peat probing and therefore will have a higher level of confidence.

10.10. Receptors and Impacts Scoped In or Out of Assessment

Receptors Scoped In to the Assessment

Table 10.2 – Receptors Scoped in to Assessment

Receptor	Scoped In
Peat, peat soil and peatland	Change to the geology or soils of an area: through direct removal, or from erosion due to the infrastructure changing the hydrological environment; dewatering of peat due to excavations or pumping; removal of peat; and an increase in the peat slide risk.

10.11. Scoping Questions to Consultees

10.11.1. The peatland on-site is degraded due to the presence of commercial forestry. Is it acceptable to undertake standard forest to bog restoration within felled areas incorporating some excavated peat?

10.11.2. Do peat excavation calculations require use of the full excavation footprint associated with all infrastructure? (Question for SEPA)

10.11.3. Is peat probing on a 10 m grid required over the excavation footprint surrounding the infrastructure footprint or is a 20 m grid acceptable? (Question for SEPA)

11. Hydrology and Hydrogeology

11.1. Introduction

11.1.1. This section considers the potential effects of the Proposed Varied Development on the hydrology and hydrogeology of the study area. It includes a baseline description of the existing conditions, followed by the proposed assessment method for determining the potential effects to be addressed in the EIA Report chapter.

11.2. Existing Baseline

11.2.1. The baseline information used to inform the EIA Report (November 2018) has been reviewed and any conditions that have changed are outlined below. The area assessed to inform the baseline includes the Site boundary plus a buffer zone of 2 km. For hydrological receptors, impacts downstream up to 5 km from the Site will also be considered, as impacts such as pollution events can be transmitted downstream for greater distances.

Surface hydrology

11.2.2. The Site is located entirely within the Water of Ken surface water catchment which flows south to join the River Dee just north of Loch Ken which continues south to discharge to the Solway Firth at Kirkcudbright. There are a number of sub catchments of the Water of Ken on-site including Polifferie Burn draining the north of the Site and Marbrack Burn draining the north-west.

11.2.3. All waters from the Site will flow through Kendoon Loch, where the Water of Ken confluences with the Water of Deugh, one of a number of hydro power stations in the area. There is a fish farm located in the north-western part of Kendoon Loch.

11.2.4. The SEPA Flood Maps indicate there is limited flooding on-site with no river flooding and just localised surface water flooding of watercourses and waterbodies within the Site. There is a high risk of the Water of Ken flooding at and around Smittons Bridge where the B729 crosses.

Hydrogeology

11.2.5. The BGS Hydrogeology (1:625,000 scale) map shows the bedrock within the Site to be a low productivity aquifer, with 'small amounts of groundwater in near surface weathered zone and fractures'.

11.2.6. During the initial survey, marshy grassland – a potential Groundwater Dependent Ecosystem (GWDTE), was identified, however as it was located within forestry rides which receive substantial surface water contributions from forestry drainage these were not considered to be groundwater dependent.

Water Quality and Water Use

11.2.7. The SEPA water classification hub was accessed in April 2024 to identify overall water quality classification status for the various watercourses connected to the Site.

11.2.8. The Water of Ken (upstream of High Bridge of Ken) and the Water of Deaugh both have an overall SEPA classification of Poor and the Water of Ken (downstream of Kendoon) has an overall SEPA classification of Bad.

11.2.9. No PWS abstractions exist within 250 m of the Site, however three PWS located in the catchment are within 2 km of the Site. These are:

- Craigengillan PWS a groundwater spring about 500 m east of the Site boundary;
- Craigengillan Cottage PWS a groundwater well about 500 m east of the Site boundary; and
- Smitton PWS about 200 m to the south-east of the Site boundary however details are currently unknown.

11.2.10. The Site is not located within a Scottish Water Drinking Water Protected Areas however, the Water of Ken flows into Carsfad Loch, about 5 km south of the Site, which is pumped to Lochinvar and supplies Lochinvar Water Treatment Works.

11.2.11. Salmon and trout fishing occur downstream on the Water of Ken. The Dee District Salmon Fisheries provided a consultation response to the Consented Development requiring fish surveys to be carried out which determined that no salmonids were present in the watercourses on the Site.

11.2.12. After an assessment of the previous baseline assessment, there are currently no known changes in the hydrology or the hydrogeologic environment aside from an increase in the reported annual rainfall in the region.

- The National River Flow Archive (NRFA) report an average annual rainfall at the Afton Reservoir (400 m AOD) about 8 km north-east of the Site of 2,367 mm for the period 1961-2017, an increase from 2,165 mm for the period (1961-1990).
- Glennlee rainfall station is located approximately 10 km south of the Site at 55 m AOD and has an average annual rainfall of 1,781 mm for the period 1991 – 2020. This has increased from an annual average rainfall of 1,721 mm for the period 1981 – 2000.

11.3. Guidance and Legislation

11.3.1. The main guidance and legislation used to inform this report includes:

Legislation:

- The Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended;
- The Environmental Protection Act 1990, as amended;
- The Pollution Prevention and Control (Scotland) Regulations 2012; and
- The Flood Risk Management (Scotland) Act 2009.

Policy:

- Scottish Government's National Planning Framework 4 (NPF4);
- Scottish Government's Planning Advice Notes (PAN) with particular reference to:
- PAN 51: planning, environmental protection and regulation;
- PAN 61: Sustainable urban drainage systems; and
- PAN 79: water and drainage.

Guidance:

- Scottish Renewables, NatureScot, SEPA & Forestry Commission Scotland (FCS)'s Good practice during Wind Farm construction Guidance (2019);
- SEPA's Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs (2014);
- SEPA's Land Use Planning System (LUPS) Guidance Notes 4 & 31 (2017);
- SEPA's Guidance for Pollution Prevention with particular reference to:
- GPP 1 Understanding your environmental responsibilities – good environmental practice (2021);
- GPP 5 Works and maintenance in or near water (2018);
- GPP 6 Working at construction and demolition sites (2023); and
- GPP 21 Pollution incident response planning (2021).

11.4. Consultation

11.4.1. No formal consultation has been undertaken with regards to land, soil, and water for the Proposed Varied Development at this stage. However, consultations will be carried out with the following stakeholders and organisations:

- SEPA in relation to hydrology;
- D&GC for PWS records; and
- Scottish Water for public water supply infrastructure.

11.4.2. In response to the s36 application for the Consented Development, the following consultation responses were received:

- SEPA raised no concerns over any water related aspects including private water supplies.
- Marine Scotland had no objection to the Consented Development. They recommend an integrated robust water quality monitoring programme takes place at selected sites potentially impacted by the proposal and at control sites (where an impact from the present proposal is unlikely). Also, the Ecological Clerk of Works should carry out regular visual inspections of all watercourses. Conditions were recommended to secure these measures.
- Fisheries Management Scotland and Scottish Water also had no objection to the Consented Development.

11.5. Study Area

11.5.1. The Study Area will include the Site plus a buffer zone of 2 km. For hydrological receptors, impacts downstream up to 5 km from the Site will also be considered, as impacts such as pollution events can be transmitted downstream for greater distances.

11.6. Assessment Methodology

Desk Based Study

11.6.1. A desk-based study was undertaken to identify and assess the hydrologic and hydrogeologic conditions of the Site, with an additional 2 km buffer around the Site boundary, extending to 5 km downstream of the Site when assessing hydrological receptors.

11.6.2. The following sources were used to inform the Scoping Report:

- Topographical information at the Site, as provided by OS contour mapping.
- 1:25,000 and 1:50,000 scale OS mapping to identify watercourses within the Site.

- SEPA (2022) online flood maps.
- Water quality information at and near the Site set out in SEPA River Basin Management Plans.
- Hydrogeology information given by BGS data accessed via Defra Magic Maps.
- Designated nature conservation sites identified using information from Nature Scot's mapping database.

Site Surveys

11.6.3. Any changes to GWDTEs will be identified based on updated habitat mapping and ecological surveys and reviewed by the hydrologists in the field where required.

11.6.4. A walkover hydrological survey of the Site will be carried out to review the existing baseline conditions, including identifying and documenting any changes to watercourse crossings (proposed and existing), identification of other water features such as wetlands and springs, undertaking an overview assessment of areas identified as floodplain within the SEPA Flood Maps and providing a general overview of landscape and land cover of importance to hydrology.

11.6.5. Private water supply visits were previously undertaken for the Consented Development. Additional visits will be undertaken, if required, following consultation with the PWS owners to verify the source location, the conveyance infrastructure, use, treatment, and if any changes have occurred to their supply.

11.6.6. The assessment will be undertaken through standard EIA methodology with the sensitivity of the receptor, magnitude of the potential effect, and likelihood of the effect being determined and then using the specified matrix to determine the significance of effect on specific receptors.

Sensitivity of Receptor

11.6.7. The sensitivity of a receptor will depend on its use, status, and level of designation. A receptor such as Class 1 carbon-rich soils or a watercourse supplying a PWS or containing Atlantic salmon would have a high sensitivity. Other receptors such as waterbodies that do not support designated species, water supplies or are of high value will have a lower sensitivity.

Magnitude of Impact

11.6.8. The magnitude of the impact is a measure of the degree that the potential effect could manifest on the receptors. For example, excavation of deep peat has a high magnitude of impact.

Likelihood of effect

11.6.9. The likelihood of the effect will be assessed to determine the probability that a receptor would be impacted by the Proposed Varied Development. This may be related to parameters such as distance from the source, likelihood of a connecting pathway or likely extent of disturbance.

Significance of Effect

11.6.10. The significance of the effect is calculated by a combination of the levels assigned for each parameter listed above. Significant effects are classified as those that are Moderate or above and will require mitigation measures to be employed above the standard good practice methods.

11.6.11. The sensitivity of the receptors will include:

Table 11.1 – Sensitivity of Receptors

Value	Description
Very High	Private water supply abstraction for human or stock consumption (surface water or groundwater). Public drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'high' (or equivalent older chemical or biological monitoring designation). Groundwater classified under the WFD as 'good'. Watercourse designated under the Freshwater Fish Directive or known to have fish spawning grounds. Groundwater vulnerability to pollution Class 5. Internationally or nationally designated sites (e.g., Ramsar, SPA, SAC, SSSI, National Nature Reserves, Marine Nature Reserves). Habitats listed in Regional Biodiversity Action Plans or Annex I habitats. Internationally important species sensitive to hydrological change.
High	Private water supply abstraction not for human or stock consumption (surface water or groundwater). Public non-drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'good' (or equivalent older chemical or biological monitoring designation). Watercourse known to support important fishery population. Groundwater vulnerability to pollution Class 4. Sites designated at a regional level. Other water dependent habitats.
Medium	Surface water classified under the WFD as 'moderate' (or equivalent older chemical or biological monitoring designation). Sites designated at a local level. Groundwater vulnerability to pollution Class 3 or 2.

Value	Description
Low	Surface water classified under the WFD as 'poor or bad' (or equivalent older chemical or biological monitoring designation). Groundwater classified under the WFD as 'poor'. Groundwater vulnerability to pollution Class 1. No private or public supply abstractions (surface water or groundwater). No designated fisheries.

Constraints Input to Design

11.6.12. The findings of the baseline assessment and survey work will contribute to environmental constraints mapping and will provide input and feedback into design iterations and subsequent environmental assessment.

11.6.13. There are industry-established good practice measures that will be employed in the design of the Proposed Varied Development and the methodologies used for the construction and operation to minimise, or mitigate for, impacts on the water environment.

11.6.14. The proposed changes to the turbine locations and infrastructure of the Consented Development will be designed to minimise the number of watercourse crossings and 50 m buffer zones around all 1:25,000 Ordnance Survey water features.

Abnormal Load Route

11.6.15. An updated assessment of potential impacts on access improvements along the B729 (originally submitted as part of the 2021 AEI II) will also be carried out in the EIA for the Proposed Varied Development, based on the results of an updated swept path analysis required due to the larger abnormal indivisible loads associated with the proposed taller turbines. Consideration will be given to the proposed working areas associate with the off-site road works and the hydrologically linked receptors as appropriate.

11.7. Existing Planning Conditions

11.7.1. Condition 28 of the decision letter states for the Consented Development that before development commences *'details of all surface water drainage provision within the application Site (which should accord with the principles of Sustainable Urban Drainage Systems (SUDS))'* should have been submitted to the Planning Authority.

11.7.2. Condition 18, of the decision letter states *'There shall be no Commencement of Development unless a Construction and Environment Management Plan (CEMP) has been submitted to and approved in writing by the Planning Authority, in consultation with NatureScot', The CEMP should include Part 2. b) 'a sustainable drainage system (SUDS) design concept including run-off and sediment control measures and flood risk management',.. q) a groundwater dependant terrestrial ecosystem protection plan; .. r) a water construction environmental plan, including a water quality monitoring programme;'*

11.7.3. Condition 12 of the decision letter, Part 3, states that a '*detailed decommissioning, restoration and aftercare plan, based upon the principles of the approved decommissioning, restoration and aftercare strategy'* must be submitted 18 months prior to decommissioning, which should include details of watercourse crossings.

11.8. Proposed Mitigation

11.8.1. The Consented Development has minimised the number of watercourse crossings and avoided, where possible, crossings of larger watercourses or those with associated floodplains. Changes to the Consented Development in the Proposed Varied Development will follow this approach.

11.8.2. Construction of watercourse crossings to allow the 1in 200 year flow plus climate change allowance and for all crossings to be open span with no structures in the channel.

11.8.3. Micrositing of changes to the Consented Development to avoid the 50 m buffers associated with watercourses.

11.8.4. Micrositing of infrastructure outside of buffer zones associated with any groundwater springs, groundwater supplies and sensitive groundwater dependent terrestrial ecosystems where possible.

11.8.5. Implementation of standard sediment control, pollution prevention measures throughout the construction and operation periods.

11.8.6. Monitoring of water quality, drainage infrastructure, watercourse crossings and track status during operation.

11.9. Potential Impacts

11.9.1. Silt and other materials may be carried by overland flow and impact the stream water quality. This will be mitigated by building infrastructure greater than 50 m from the nearest watercourse where possible and employing good practice methods for construction and water management throughout. Any encroachments from the final layout will be documented and assessed.

11.9.2. The groundwater has a high vulnerability value of 5 – 4b with a SEPA classification of 'good'. The run-off from construction material could impact the groundwater quality due to entering the system via secondary fractures. However, the groundwater is a low productivity aquifer and no GWDTEs or private water supplies reliant on groundwater were previously identified on the Site.

11.10. Receptors and Impacts Scoped In and Out of Assessment

Table 11.1 Receptors Scoped In and Out of the Assessment

Receptor	Scoped In
Watercourses	Where the Site is hydrologically connected, the construction and decommissioning of the Proposed Varied Development has the potential to impact on surface watercourses where infrastructure is unable to be located outside of the 50 m buffer. This would be limited to watercourse crossings and upgraded access tracks. However, Water of Ken is the source for Scottish Water public water supply.
Groundwater terrestrial ecosystems	Updated habitat surveys will be reviewed to determine if any potential GWDTEs are present on site and if they are located within the buffer zones of the proposed Revised Development. Where there is a potential hydrogeological connection, the habitats will be assessed to determine if they are actually groundwater dependent.
Private Water Supplies	Although the groundwater PWS at Craigengillan and Craigengillan cottage are over 500 m from the Proposed Varied Development and can be scoped out there is currently no information for the Smittons property and a check for any new properties will also be completed.
Receptor	**Scoped Out**
Public Water Supplies	The Carsfad Loch, about 5 km downstream of the Site and connected to the Water of Ken, is used to supply water to the Lochinvar Water Treatment Works. Given the substantial distance and buffering capacity it is considered that this supply can be scoped out of the assessment.
Flood Risk	All infrastructure, with the exception of any watercourse crossings, will be located outside of any flood zones and drainage will be managed according to SuDS to avoid any increase in flooding due to infrastructure. Any watercourse crossing will be constructed to 1:200 year flow plus climate change. It is therefore considered that flood risk can be scoped out of the assessment.

11.11. Scoping Questions to Consultees

11.11.1. Is it agreed that Public Water Supplies and Flood Risk can be scoped out of the assessment?

11.11.2.

11.11.3.

12. Noise and Vibration

12.1. Introduction

12.1.1. This Chapter has been prepared by TNEI Services Limited and considers the potential impacts relating to noise and vibration during the construction, operational and decommissioning phases of the Proposed Varied Development.

12.1.2. The Consented Development comprises 17 wind turbines, with a maximum blade tip height of 125 to 149.9 m and, in comparison, the Proposed Varied Development comprises 13 wind turbines, each up to 200 m blade tip height. There are other subtle changes expected, however in regard to noise it is considered that the changes of wind turbine layout and wind turbine model are the key noise topics that need to be re-assessed in detail. These changes will mostly affect operational noise.

12.1.3. Accordingly, the potential operational noise impact from the Proposed Varied Development's wind turbines will be assessed in detail, at the nearest Noise Sensitive Receptors (NSRs) with a methodology described below. Other topics such as noise and vibration from the construction and decommissioning phases of the wind turbines are also discussed in this section.

12.2. Existing Baseline

12.2.1. The Site is located in a rural location with large areas of forestry, hills and valleys in the immediate surroundings. There are a relatively small number of scattered residential properties within and around the Site, which will need to be considered as NSRs.

12.2.2. A review of potential nearby wind farm development to consider potential cumulative impacts has been undertaken. The Windy Rig Wind Farm was considered in the previous operational wind farm noise assessment for the Consented Development, so it will be considered again. In addition, Quantans Hill Wind Farm immediately to the west is now a live s36 application and will also be considered. This list will be kept under review during the course of the EIA process.

12.2.3. The relevant NSRs were identified previously in the noise assessment which was prepared to support the s36 application for the Consented Development and a baseline noise survey was undertaken at seven Noise Monitoring Locations (NMLs). Also, for the nearby Quantans Hill Wind Farm, additional NSRs were identified further west, but no new baseline noise surveys were undertaken as part of the Quantans Hill Wind Farm noise assessment.

12.2.4. **Figure 12.1** shows all identified NSRs surrounding both the Proposed Varied Development and Quantans Hill Wind Farm. In **Figure 12.1**, the Noise Monitoring Locations (NMLs) are also shown as well as the receptors suggested for a detailed assessment, identified as Noise Assessment Locations (NALs).

12.2.5. The baseline noise levels at the 7 NMLs were established in accordance with the guidance from The Working Group on Noise from Wind Turbines (1996) ETSU-R-97 The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97), and the wind speeds were standardised from 91.5 m to 10 m. The baseline noise levels were used as a reference to set the noise limits found in condition 29 of the ECU decision letter dated 21 August 2023 for the Consented Development.

12.2.6. Whilst the baseline survey at the NMLs was undertaken between November 2013 and January 2014, it was still used as a reference to set noise conditions in 2023. Baseline noise levels for wind farm noise assessments define the noise environment in the absence of wind farm in the area. There are no significant known or anticipated changes in the local area that would change baseline noise levels from those measured in 2014 (i.e. no new major roads or industries). Quantans Hill Wind Farm has not presented any new baseline levels in its recent planning submission. As such, it is anticipated that the baseline levels presented for the Consented Development application can be re-used to set limits, albeit there may be a requirement to make a wind shear adjustment to account for higher hub heights which are now being proposed; this requirement will be reviewed as part of the EIA process.

12.3. Guidance and Legislation

Guidance and Legislation

12.3.1. The relevant legislation and guidelines to be considered will be:

- National Planning Framework 4 ('NPF4');
- Web Based Renewables Advice: 'Onshore Wind Turbines';
- Planning Advice Note PAN 1/2011: 'Planning and Noise';
- ETSU-R-97 – to assess wind farm operational noise; and
- Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise', 2013 (IOA GPG) – to assess wind farm operational noise.

12.3.2. Decision makers must consider National Energy and Planning Policy, and, in the context of a s36C Application, the statutory Development Plan. As of February 2023, NPF4 now forms part of the statutory Development Plan alongside the relevant Local Development Plan and any related Supplementary Guidance. Such plans will often contain policies tailored specifically to control certain kinds of development and such policies should carry more weight and be more dominant in the minds of decision makers.

12.3.3. NPF4 Policy 11 – Energy states that renewable energy projects must be able to demonstrate how any noise impacts on communities have been addressed through the project's design and any associated mitigation. Policy 23 – Health and Safety outline how '*development proposals that are likely to raise unacceptable noise issues will not be supported'* and states that *'a Noise Impact Assessment may be required where the nature of the proposal or its location suggests that significant effects are likely.'*

12.3.4. The Scottish Government's online Onshore Wind: Policy Statement 2022 (published on 21 December 2022) states in Section 3.7 that:

'The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments.'

12.4. Consultation

12.4.1. Consultation with Dumfries and Galloway Council Environmental Health Department will be undertaken during the EIA process in order to agree key parameters for the noise assessment.

12.5. Study Area

12.5.1. As stated above in the baseline section, the Study Area will include the nearest NSRs considered to be representative of residential dwellings in the immediate vicinity that may be subject to the effects of operational wind farm noise from the Proposed Varied Development. These are already identified and shown in **Figure 12.1**. Of all identified NSRs, a total of 14 NALs are suggested for a detailed noise assessment, and these are also shown in **Figure 12.1** and described in **Table 12.1** below.

Table 12. 1 - Noise Assessment Locations

NAL Id	NAL Name	Easting	Northing
NAL01	Moorbrock	262939	596644
NAL02	Strahanna Farm	264550	595867
NAL03	Craigengillan Cottage	263628	594937
NAL04	Craigengillan	263690	594831
NAL05	Blackmark	265286	591687
NAL06	Stroanpatrick	264309	591961
NAL07	Smittons	263295	591702
NAL08	1 Muirdrochwood	261850	591137
NAL09	2 Muirdrochwood	261826	591121
NAL10	Marscalloch Cottage	260382	591387
NAL11	Nether Loskie	260027	591748
NAL12	Furmiston	260326	592328
NAL13	Marbrack Farm	259729	593306
NAL14	Marbrack Cottage	259648	593236

12.6. Assessment Methodology

12.6.1. ETSU-R-97 details the methodology for establishing noise limits for proposed wind farm developments and the limits that should not be exceeded. ETSU-R-97 states that noise limits should be set relative to existing background noise levels at the nearest receptors and that these limits should reflect the variation in both turbine source noise and background noise with wind speed. Separate noise limits apply for quiet daytime and for night-time periods. Quiet daytime limits are chosen to protect a property's external amenity, and night-time limits are chosen to prevent sleep disturbance indoors, with windows open.

12.6.2. ETSU-R-97 recommends that wind farm noise for quiet daytime periods should be limited to 5 dB(A) above the prevailing background or a fixed minimum level within the range 35 – 40 dB, whichever is the higher (all references to dB(A) levels relate to LA90 10 mins values). The precise choice of criterion level within the range 35 – 40 dB(A) depends on a number of factors, including the number of dwellings in the neighbourhood of the wind farm (relatively few dwellings suggest a figure towards the upper end), the effect of noise limits on the number of kWh generated (larger sites tend to suggest a higher figure) and the duration and level of exposure to any noise.

12.6.3. Given the generating capacity of the scheme will be above 50 MW and generate a significant amount of electricity, and given that the nearby Quantans Hill Wind Farm has already agreed a fixed minimum of 40 dB(A) with Dumfries and Galloway Council (confirmed in the submitted ES for Quantum Hill), it is proposed that a fixed minimum of 40 dB(A) will also apply in daytime for the noise assessment of the Proposed Varied Development.

12.6.4. For night-time, ETSU-R-97 recommends that wind farm noise should be limited to 5 dB(A) above the prevailing background or a fixed minimum level of 43 dB, whichever is the higher.

12.6.5. An exception to the setting of both quiet daytime and night-time fixed minimum limit occurs where a property occupier has a financial involvement with the Proposed Varied Development. In that case the fixed minimum limit can be increased to 45 dB or the prevailing background noise plus 5 dB, whichever is the greater for both the quiet daytime and night-time periods.

12.6.6. Cumulative operational wind farm noise predictions will be undertaken, and the potential cumulative impact assessed. The IOA GPG suggests that cumulative noise effects need not be considered where differences between the noise level contribution of two wind farms are 10 dB or more. The approach to the cumulative noise assessment will be agreed in direct consultation with Dumfries and Galloway Council. An apportionment of limits between the Proposed Varied Development and the proposed Quantans Hill Wind Farm will also be considered, as both would be live planning application with broadly similar timescales for planning decision.

12.6.7. Overall, the proposed noise assessment will:

- Set 'Total ETSU-R-97 Noise Limits' (also called cumulative noise limit) for all wind farms in the area, re-using existing baseline noise levels, fixed minimum criteria, and if required wind shear adjustments;
- Undertake new noise predictions for the Proposed Varied Development for the new layout and candidate wind turbine model. The predictions will also include cumulative scenarios with other nearby wind farms; and
- Calculate and suggest apportioned 'Site Specific Noise Limits' for conditioning, specific for the Proposed Varied Development on its own. If required, sharing of limits with the nearby Quantum Hill will be suggested.

12.7. Existing Planning Conditions

12.7.1. As detailed above, existing noise limit values for operational wind farm noise are found in condition 29 of the Consented Development decision letter, for nearby residential properties. These values will be re-used, albeit with potential changes to account for fixed minimum criteria, wind shear, the current cumulative situation and current best practice.

12.8. Proposed Mitigation

12.8.1. One of the key design considerations will be operational noise levels. As part of the assessment, noise limits for operational wind farm noise will be established at sensitive receptors. Mitigation of wind turbine operational noise will be achieved through the design of the Proposed Varied Development, such that the relevant ETSU-R-97 noise limits can be achieved at the surrounding properties with commercially available wind turbines.

12.9. Potential Impacts

12.9.1. The noise assessment will consider the noise associated with the operation of the Proposed Varied Development's wind turbines (including cumulative noise due to operation of any neighbouring wind farms). A detailed noise assessment in accordance with ETSU-R-97 and current good practice will be undertaken.

12.9.2. Where noise levels resulting from the operation of the Proposed Varied Development are likely to be above the relevant limit levels, derived in line with ETSU-R-97 and the IOA GPG, the development will be considered as having significant effects in EIA terms. Where operational noise levels meet the ETSU-R-97 noise limits, the development will be considered as having no significant effects. Depending on the levels of background noise, the satisfaction of the ETSU-R-97 derived limits can lead to a situation whereby, at some locations under some wind conditions and for a certain proportion of the time, the wind turbine noise would be audible.

12.10. Receptors and Impacts Scoped In and Out of Assessment

12.10.1. It is suggested that noise and vibration associated with the construction phase can be scoped out of the assessment. Given the nature of the construction activities proposed, and the relative distances from residential receptors, the risk of ground borne vibration during construction activities impacting on residential receptors is considered very low. Any impact from operational vibration is also temporary and was already assessed previously as having no significant effect. There are no substantial changes to the Proposed Varied Development that suggest this would change, for example the access tracks would remain at similar locations in comparison to the nearest NSRs. For the construction and decommissioning phase, it is suggested that core hours of work are conditioned and that good practice construction techniques are outlined in a CEMP in accordance with the approach already taken for the Consented Development.

12.10.2. Also, it is proposed that the following operational wind farm noise topics are scoped out of the assessment:

- Wind Farm Operational Noise - Low-Frequency Noise (more information below)
- Wind Farm Operational Noise - Amplitude Modulation (more information below)

Abnormal Load Route

12.10.3. Based on the results of an updated swept path analysis, an updated assessment of the potential impacts on access improvements along the B729 (originally submitted as part of the 2021 AEI II) will also be carried out in the EIA for the Proposed Varied Development.

12.10.4. Construction works for the Abnormal Load route (i.e. turbine transfer area) would be localised and temporary with a duration of less than 1 month are unlikely to constitute a significant effect. The works would be relatively non-invasive, with no piling or deep excavation anticipated. As such, there is no reasonable prospect of a significant effect. Additionally, best practicable means of reducing noise emissions from plant, machinery and construction activities will be used.

Low Frequency Noise

12.10.5. Low-frequency noise and infrasound has been considered in the 'Review of noise guidance for onshore wind turbines' by WSP and BEIS (WSP, 2023). The report considered a number of studies which investigate claimed links between adverse health symptoms and infrasound emissions from wind turbines. The report notes on page 116 that:

"It has been demonstrated in controlled experiments, including the involvement of participants self-reporting to be sensitive to wind turbine infrasound, that exposure to infrasound at levels representative of wind turbine emissions at dwellings is not associated with physiological or psychological health effects, whereas the expectation of effects from being exposed to wind turbine infrasound, and positive or negative messages influencing that expectation, can affect health symptom reporting…

…Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin…

…It is expected that further evidence from ongoing studies into wind turbine infrasound effects will emerge soon, in particular from the NHMRC studies in Australia. However, based on the existing scientific evidence, it does appear probable that the above findings will not be contradicted by newer evidence".

12.10.6. Since the publication of the report, the study that was granted funding by the National Health and Medical Research Council of Australia (NHMRC) was presented in the Environmental Health Perspectives (EHP) journal, which is published by the United States National Institute of Environmental Health. This study by Marshall et al. (2023) aims to test the effect of exposure to 72 hours of infrasound (designed to simulate a wind turbine infrasound signature) on human physiology, particularly sleep; it concluded that, *"Our findings did not support the idea that infrasound causes WTS[1]. High level, but inaudible, infrasound did not appear to perturb any physiological or psychological measure tested in these study participants".*

12.10.7. It is therefore not considered necessary to carry out specific assessments of low frequency noise and infrasound and that they should be scoped out.

Amplitude Modulation (AM)

12.10.8. AM by definition, is the regular variation in noise level of a given noise source. This variation (the modulation) occurs at a specific frequency, which, in the case of wind turbines, is defined by the rotational speed of the blades (i.e. it occurs at the rate at which the blades pass a fixed point (e.g. the tower)), known as Blade Passing Frequency.

12.10.9. The WSP and BEIS report discusses AM, and on page 119 states that, *"At present, it seems evident that reliable predictions of AM in the context of development planning and noise assessment guidance are unlikely to be practically feasible in the near future".*

12.10.10. At the time of writing there is no agreed methodology which can be used to predict the occurrence of AM and as such no assessment of AM will be undertaken. Therefore, it is proposed that this topic is be scoped out.

[1] WTS stands for Wind Turbine Syndrome which is a term for adverse human health effected related to the proximity of wind turbines.

12.11. Scoping Questions to Consultees

12.11.1. The scoping questions proposed to Consultees are as follows:

- Do you agree with the proposed assessment methodologies (ETSU-R-97 and the IOA GPG)?
- Do you agree with the proposed approach to the operational noise assessment, specifically re-using existing baseline noise levels in combination with fixed minimum criteria, and if required wind shear adjustments to set Total ETSU-R-97 Noise Limits applicable for all wind farm in the area and Site Specific Noise Limits for the Proposed Varied Development?
- Do you agree that assessment of noise and vibration from the construction and decommission phases can be scoped out of the EIA?
- Can you confirm the suggested Noise Assessment Locations (NALs) identified in this scoping chapter are suitable or suggest location(s) if applicable?
- Do you agreed that the assessment of Low Frequency Noise and Amplitude Modulation (operational wind farm noise) can be scoped out of the EIA?

13. Traffic and Transport

13.1. Introduction

13.1.1. This section of the Scoping Report covers the predicted access, traffic and transport issues that may arise from the construction of the Proposed Varied Development, the significance of these effects and what suitable mitigation measures can be put in place to offset any adverse impacts.

13.1.2. The Access, Traffic and Transport Chapter will be supported by a Transport Assessment report, Route Survey Report (RSR) for abnormal indivisible loads (AILs) and technical figures.

13.1.3. The key issues for consideration as part of the assessment will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction phase;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to offset any temporary effects.

13.1.4. The potential effects of these will be examined in detail in the EIA Report Chapter.

13.2. Existing Baseline

13.2.1. The proposed study area is as follows, and has been identified through a review of the likely routes used to access the Site for construction materials and suppliers of equipment:

- A713 between Dalmellington and St Johns Town of Dalry; and
- B729 between the Site access junction and its junction with the A713.

13.2.2. Baseline traffic data for the A713 and B729 will be obtained from the new Automatic Traffic Count (ATC) surveys. Wider area data will be obtained from the Department for Transport (DfT) road traffic database.

13.2.3. National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will be used to provide a common future year baseline to coincide with the expected construction traffic peak.

13.2.4. Traffic accident data would be obtained from Crashmap UK for the study network to inform the accident review for the immediate road study area. Five years of available data within the proposed study area will be collated.

13.2.5. The proposed study area is similar to that used in the previous assessment of the Consented Development.

13.3. Guidance and Legislation

13.3.1. The following policy and guidance documents will be used to inform the Access, Traffic and Transport Chapter:

- Transport Assessment Guidance (Transport Scotland, 2012);
- Institute of Environmental Assessment, Environmental Assessment of Traffic and Movement (2023); and
- National Planning Framework (NPF) 4 (Scottish Government, 2023).

13.4. Consultation

13.4.1. As with the Consented Development, consultation will be undertaken in detail with Dumfries & Galloway Council and the Ayrshire Roads Alliance.

13.4.2. Consultation regarding the Abnormal Indivisible Load (AIL) turbine components will be undertaken with all relevant structure owners on the proposed access route.

13.5. Assessment Methodology

13.5.1. The main transport impacts will be associated with the movement of general Heavy Goods Vehicles (HGV) traffic travelling to and from the turbine development area during the construction phase of the Proposed Varied Development.

13.5.2. IEMA Guidelines sets out a methodology for assessing potentially significant environmental effects as a result of construction traffic. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

13.5.3. The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%).
- Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more.

13.5.4. Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Varied Development will therefore be assumed to result in no discernible environmental impact and as such no further consideration will be given to the associated environment effects.

13.5.5. The estimated traffic generation of the Proposed Varied Development will be compared with baseline traffic flows, obtained from traffic survey data in order to determine the percentage increase in traffic.

13.5.6. Potentially significant environmental effects will then be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate.

13.5.7. Committed development traffic i.e., those from proposals with planning consent will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at scoping would not be included.

13.5.8. It is not anticipated that a full Transport Assessment will be required as these are not generally considered necessary for temporary construction works. A reduced scope Transport Assessment is therefore proposed.

13.5.9. Each turbine is likely to require between 11 and 14 abnormal loads to deliver the components to Site (dependant on the final turbine selection). The components will be delivered on the extendable trailers which will then be retracted to the size of a standard HGV for the return journey.

13.5.10. Detailed swept path analysis will be undertaken for the main constraint points on the route from the port of entry (assumed to be King George V Docks in Glasgow at this time) through to the Site access junction to demonstrate that the turbine components can be delivered to Site and to identify any temporary road works which may be necessary.

13.6. Existing Planning Conditions

13.6.1. There are five planning conditions from the Consented Development that relate to Transport and Access matters, namely:

- Condition 20: Traffic Management Plan;
- Condition 21: Abnormal Load Route – trailer type;
- Condition 22: Abnormal Load Route – off-site works;
- Condition 33: Roads – extraordinary damage;
- Condition 35: Traffic Monitoring Officer; and
- Condition 36: Community Liaison Group.

13.6.2. The s36C submission will include a framework Construction Traffic Management plan (CTMP) to address the points raised in Condition 20, a detailed Route Survey Report that will outline the abnormal load route, works, trailer proposals and management measures to address Conditions 21 and 22 (in part).

13.6.3. The framework CTMP will also address the requirements of previous Conditions 35 and 26. The mitigation measures will address Condition 33.

13.7. Proposed Mitigation

13.7.1. Standard mitigation measures that are likely to be included in the assessment are:

- Production of an outline CTMP;
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Travel Plan; and
- A Framework Abnormal Load Transport Management Plan.

13.7.2. Additional mitigation will be included should the assessment reveal criteria that are significant following the application of standard mitigation measures.

13.7.3. Site specific mitigation, based upon experience of other schemes in the surrounding area, will include:

- Section 96 Agreement of the Roads (Scotland) Act to protect the public road against abnormal wear and tear in the study area;
- Design of the Site access junction to ensure that approved access routes are adhered to; and
- Enhanced temporary construction warning and direction signage.

13.7.4. Details of these measures will be outlined in the Transport Assessment.

13.8. Potential Impacts

13.8.1. Potential impacts that may arise during the assessment may include the following for users of the road and those resident along the delivery routes*:*

- Severance;
- Driver delay;
- Pedestrian delay;

- Non-motorised user amenity;
- Fear and intimidation;
- Road safety; and
- Large loads.

13.8.2. These match the criteria noted in the revised IEMA guidelines of 2023, and are similar to those used in the previous assessment.

13.9. Receptors and Impacts Scoped In and Out of Assessment

13.9.1. There are three phases of the Proposed Varied Development, which would typically be considered within any assessment and are as follows:

- The Construction Phase;
- The Operational Phase; and
- The Decommissioning Phase.

13.9.2. Of the three phases, the construction phase is considered to have the greatest impact in terms of transport and potential impacts on the road network and sensitive receptors. Construction plant, bulk materials and wind turbine components will be transported to Site, potentially resulting in a significant increase in traffic on the study network. As such, the construction phase represents a worst case assessment scenario.

13.9.3. Once operational, it is envisaged that the level of traffic associated with the Proposed Varied Development would be minimal. Regular monthly or weekly visits would be made to the wind farm for maintenance checks. It is considered that the effects of operational traffic would be negligible and far below the construction phase traffic, and therefore no detailed assessment of the operational phase of the Proposed Varied Development is proposed.

13.9.4. The traffic generation levels associated with the decommissioning phase will be less than those associated with the construction phase as some elements such as access roads would be left in place on the Site. As such, the construction phase is considered the worst case assessment to review the impact on the study area. An assessment of the decommissioning phase will therefore not be undertaken, although a commitment to reviewing the impact of this phase would be made immediately prior to decommissioning works proceeding.

13.10. Scoping Questions to Consultees

- Is the proposed methodology acceptable?
- Are the methods proposed for obtaining traffic flow data acceptable?
- Is use of Low National Road Traffic Forecasts (NRTF) acceptable for the whole of the study?
- What developments should be included as committed developments within the baseline traffic flows in the assessment, noting that these should have planning consent at the time of scoping?
- Are there any details of any upgrades or network changes that may be undertaken to the study area network within the next five years?

14. Aviation and Radar

14.1. Introduction

14.1.1. This section sets out the proposed approach to the assessment of potential effects on aviation and radar during the construction and operation of the Proposed Varied Development.

14.1.2. Wind turbines have the potential to affect civil and military aviation and meteorological forecasting. This section of the report covers the methodology that will be used to undertake the aviation and radar assessment, describes the baseline condition, consultation requirements and potential mitigations to be applied if required.

14.2. Existing Baseline

14.2.1. The Proposed Varied Development Site is located 63 km to the north-east of the dormant Ministry of Defence (MoD) airfield at West Freugh and 42 km to the south-east of Glasgow Prestwick Airport. The RAF Spadeadam range is over 100 km to the south-east. The Site is under an area with a complex controlled airspace structure as it is within the Scottish Terminal Area (TMA), designed to protect aircraft arriving and departing from Prestwick, Edinburgh and Glasgow airports. The TMA has a base of 5500 ft in this location. The area under the TMA is Class G unregulated airspace that is also used extensively by the MoD for training and low flying. In aviation terms, the baseline for the Proposed Varied Development. is the same as that for the Consented Development.

14.3. Guidance and Legislation

14.3.1. There are a number of aviation publications relevant to the interaction of wind turbines and aviation containing guidance and legislation, which cover the complete spectrum of aviation activity in the UK, as listed below:

- Civil Aviation Authority (2006). Safeguarding of Aerodromes, Version 2, CAP774 CAA;
- Civil Aviation Authority (2010). Safe Operating Practices at Unlicensed Aerodromes, Ed 1, CAP 783 CAA;
- Civil Aviation Authority (2016) Policy and Guidelines on Wind Turbines Version 6, CAP764 CAA;
- Civil Aviation Authority (2017). CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level CAA;
- Civil Aviation Authority (2017). Manual of Air Traffic Services, Part 1, Ed 7.0, CAP 493 CAA;
- Civil Aviation Authority (2017). UK Flight Information Services, Ed 3, CAP 774 CAA;

- Civil Aviation Authority (2019). ATS Safety Requirements, Version 3, CAP 670 CAA;
- Civil Aviation Authority (2019). Licensing of Aerodromes, Version 11, CAP 168 CAA;
- Civil Aviation Authority (2020). Parachuting, Ed 5, CAP660 CAA;
- Civil Aviation Authority (2022). Implementation of Safeguarding of Instrument Flight Procedures (IFPs) in the UK, Ed 2, Version 2, CAP 785B CAA;
- Ministry of Defence (MoD) (2022). Military Aviation Authority Regulatory Article 2330 (Low Flying);
- MoD Specification for IR lighting AL4 dated 16 Jan 2013;
- CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level dated 01/06/17; and
- NatureScot General pre-application and scoping advice for onshore wind farms dated Sep 2020.

14.3.2. These remain the same as those considered for the Consented Development with the exception of the aviation lighting guidance which is now required as the Proposed Varied Development will have turbines in excess of 150 metres tip height.

14.4. Consultation

14.4.1. Consultation for the Consented Development was undertaken with the following aviation stakeholders:

- Ministry of Defence (Defence Infrastructure Organisation (DIO))
- Glasgow Prestwick Airport
- National Air Traffic Services (NATS) En Route Ltd (NERL)

14.4.2. It will be necessary to consult with the same stakeholders again given the proposed increase in turbine tip height and the change in turbine locations although the overall footprint of the Proposed Varied Development is within the area of the Consented Development. Initial radar modelling indicates that there is no significant difference in relation to radar modelling or interference effects, however this will be confirmed and reported in the EIA Report.

14.5. Study Area

14.5.1. Study areas with the following radii from the Site boundary will be used to identify potentially affected aviation and defence facilities:

- airfield with a surveillance radar – 30 km;
- non radar licensed aerodrome with a runway of more than 1.1 km – 17 km;
- non radar licensed aerodrome with a runway of less than 1.1 km – 5 km;
- licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- unlicensed aerodromes with runways of more than 800 metres – 4 km;
- unlicensed aerodromes with runways of less than 800 metres – 3 km;
- gliding sites – 10 km; and
- other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

14.5.2. CAP 764 further states that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders and will be reported upon in the EIA Report. However in this case, this is the same as was undertaken for the Consented Development.

Ministry of Defence

14.5.3. It is necessary to take into account the aviation and air defence activities of the MoD. The types of issues that will be addressed include:

- Ministry of Defence Airfields, both radar and non-radar equipped;
- Ministry of Defence Air Defence Radars;
- UK Met Office Meteorological Radars; and
- Military Low Flying.

National Air Traffic Services (NERL) Facilities

14.5.4. It is necessary to take into account the possible effects of wind turbines upon NERL radar systems – a network of primary and secondary radars and navigation facilities around the country.

14.6. Assessment Methodology and Potential Impacts

Radar Modelling Methodology

14.6.1. The radar calculations that will be undertaken and included in the EIA Report will be produced using specialist propagation prediction software (RView Version 5). Developed over a number of years by WPAC, it has been designed and refined specifically for the task. RView is used to identify potential aviation effects of the Proposed Varied Development. The results are then used as a basis for consultation and liaison with relevant aviation bodies, as detailed below. RView models terrain using the Ordnance Survey (OS) Terrain 50 digital terrain model, which has a post spacing of 50 m and has a root mean square (RMS) error of 4 m. The results are verified using the Shuttle Radar Topography Mission (SRTM) dataset, a separate smoothed digital terrain model with data spacing of 3 arc seconds. By using two separate and independently generated digital terrain models, anomalies are identified and consistent results assured. Rview models the refractive effects of the atmosphere on radio waves and the First Fresnel Zone. A feature of RView is that as well as performing calculations in the manner believed to be most appropriate, it also allows comparison with results from simpler models. For example, RView can perform calculations using the true Earth Radius at the midpoint between the radar and the wind turbine or the simplified 4/3 Earth Radius model. If needed, Rview is also capable of modelling a range of atmospheric refractive conditions. RView models the trajectory of radar signals at different elevations allowing modelling of both volume surveillance and pencil beam radars as well as the effects of angular sterilisation as applied, for example, in Met Office radars.

Assessing Significance

14.6.2. There is no agreed or mandated definition of significance when assessing development proposals for wind farms in relation to aviation. Whilst technical effects on communications, navigation and surveillance (CNS) systems are simple to identify and evaluate, operational and flight safety effects can be subjective and are often challenged by third parties. It is sufficient in this context to identify any technical effects and then, taking into account the statements in CAP 764 regarding the status of aviation stakeholders, in general to accept the judgement of those stakeholders in assessing the significance of the effects. For example CAP 764 states:

"*Where an ANSP determines that it is likely that a planned wind turbine development would result in any of the above effects on their CNS infrastructure, this may not, in itself, be sufficient reason to justify grounds for rejection of the planning application. The ANSP must determine whether the effect on the CNS infrastructure has a negative impact on the provision of the ATS. The developer should pay for an assessment of appropriate mitigating actions that could be taken by the ANSP and/or wind energy developer to deal with the negative impact. The position of an ANSP at inquiry would be significantly degraded if they had not considered all potentially appropriate mitigations.*"

14.6.3. Therefore, it is not considered to be appropriate for the Applicant to make an assessment of the significance of an effect in relation to aviation interests. Also, it is often the case that different Air Navigation Service Providers (ANSP) take a different view of the same scenario and may disagree with the assessment findings; this can require further post submission consultation, to confirm the findings of the assessment and/or agree to the need for and extent of mitigation. Therefore, the EIA Report will not make a judgement of significance, but will focus on identifying potential impacts and agreeing mitigation with aviation stakeholders as required. This is the same as the methodology employed in the EIA Report for the Consented Development.

14.7. Potential Impacts

14.7.1. In aviation terms, the differences between the Consented Development and the Proposed Varied Development are very small. The Site is in the same location with a very similar development footprint, has a reduced number of turbines but with an increase in turbine tip height.

14.7.2. Initial radar modelling of the Proposed Varied Development in relation to the NATS Great Dun Fell radar indicates that all of the turbines will be in radar line of sight and mitigation will be required. Radar modelling will also be undertaken against the Lowther Hill radar which also provides low level coverage in this area, again the outcome will be reported in the EIA Report.

14.7.3. The MoD did not object to the Consented Development and are not expected to object in this case, a detailed assessment in relation to tactical low flying indicates that there will be no increase in the effect on military low flying and this will be reported in detail in the EIA Report,

14.7.4. Aviation Lighting – the main difference between the Consented Development and the Proposed Varied Development is the increase in turbine tip height. The Consented Development has turbines that are less than 150 metres to tip and therefore do not require visible aviation obstruction lighting. The Proposed Varied Development has turbines in excess of 150 metres tip height. Aviation lighting will be required in accordance with CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level dated 01/06/17.

14.7.5. WPAC will produce a lighting layout that will minimise the number of lit turbines consistent with flight safety and obtain approval from the CAA for the layout. This will be reported in the EIA Report in an Appendix which will identify the lit turbines and provide information on the visibility of turbine lights from the LVIA approved viewpoint list. Lighting mitigation will also be identified, and the report will fulfil the NatureScot requirement for an Aviation Lighting and Mitigation Plan.

14.8. Existing Planning Conditions

14.8.1. Planning condition 5 is a radar mitigation condition. It states the following:

'*No part of any turbine shall be erected above ground unless the Company has agreed a Primary Radar Mitigation Scheme (PRMS) with the Operator which has been submitted to and approved in writing by the Scottish Ministers in order to mitigate the impact of the Development on the Primary Radar Installation located at Great Dun Fell and associated air traffic management operations'.*

'No part of any turbine shall be erected above ground unless the approved PRMS has been implemented and the Development shall thereafter be operated fully in accordance with such approved PRMS. For the purpose of this condition 5: "Operator" means NATS (En Route) plc, incorporated under the Companies Act (4129273) whose registered office is 4000 Parkway, Whiteley, Fareham, Hants PO15 7FL or such other organisation licensed from time to time under sections 5 and 6 of the Transport Act 2000 to provide air traffic services to the relevant managed area (within the meaning of section 40 of that Act). "Primary Radar Mitigation Scheme" or "PRMS" means a detailed scheme agreed with the Operator which sets out the measures to be taken to avoid at all times the impact of the Development on the surveillance infrastructure and air traffic management operations of the Operator at Great Dun Fell. Reason: In the interest of air safety.'

14.8.2. Planning Condition 27 Air Safety requires:

'*There shall be no Commencement of Development unless the Company has provided the Planning Authority, MoD, Defence Geographic Centre and National Air Traffic Services with the following information, and has provided evidence to the Planning Authority of having done so: a) the date of the expected commencement of each stage of construction; b) the height above ground level of the tallest structure forming part of the Development; c) the maximum extension height of any construction equipment; and d) the position of the wind turbines and masts in latitude and longitude. Reason: In the interests of aviation safety.'*

14.8.3. This condition will also apply to the Proposed Varied Development, unchanged.

14.9. Mitigation

14.9.1. It is likely that the same mitigation for Great Dun Fell as agreed for the Consented Development should suffice. NATS will be reconsulted to confirm their position and the outcome reported in the EIA Report.

14.9.2. The MoD will, however, require the turbines to be illuminated with infra-red lights compliant with the MoD specification.

14.10. Receptors and Impacts Scoped In and Out of Assessment

14.10.1. Impacts scoped in will include the following:

- MoD RAF Spadeadam Deadwater Fell Radar Assessment
- MoD Low Flying
- Glasgow Prestwick Airport Radar Assessment
- NERL Radar Assessment
- Aviation Lighting

15. Socio-economics, Tourism and Recreation

15.1. Introduction

15.1.1. BiGGAR Economics has been commissioned to undertake the socio-economic, tourism and recreation elements of the Proposed Varied Development.

15.1.2. Socio-economic, tourism and recreation analysis of onshore wind farms over the last decade have found no adverse effects assessed as significant in terms of the EIA Regulations. This includes the analysis of the Consented Development, which found no significant adverse effects. There is no reason to expect significant effects for the Proposed Varied Development. NPF4 has introduced the requirement for energy developers to demonstrate how their projects will maximise net economic impacts. It is therefore proposed to scope socio-economics, tourism and recreation out of the EIA Report.

15.1.3. Nevertheless, it is recognised that socio-economic and tourism issues will be of interest to stakeholders and local authorities and so a separate report on socio-economics and tourism will be provided and submitted alongside the EIA. This section describes what will be considered in the separate socio-economic and tourism report and the approach that will be taken.

Guidance & Legislation

15.1.4. There is no specific legislation or guidance on the methods that should be used to analyse the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including that used in the UK Government and industry reports on the sector. In particular, this analysis will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector: a report published by RenewableUK and the Department for Energy and Climate Change (DECC) in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy and a subsequent update to this report published by RenewableUK in 2015.

15.1.5. There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on general tourism and recreation interests. The proposed method will consider specific attractions or tourism facilities to assess if there could be any effects from the development.

15.1.6. For recreational assets, guidance has been provided by NatureScot (NS) on how to assess effects on recreational amenity and the approach outlined has been used. This takes into consideration a number of potential effects, including direct effect on facilities, such as limitation or restrictions on access, and effects on the intrinsic quality of the resources enjoyed by people. In general, this guidance would consider recreational and access impacts to potentially be significant if:

- permanent or long-term effects on the resources on which enjoyment of the natural heritage depends, in particular where facilities have been provided by NS or others under statutory powers;
- permanent or long-term change that would affect the integrity and long-term sustainable management of facilities which were provided by NS or others under statutory powers;
- where there are recreational resources for open air recreation pursuits affected by the proposal which have more than local use or importance, especially if that importance is national in significance;
- major constraints on or improvements for access or accessibility to designated natural heritage sites; and
- where mitigation and/or compensatory or alternative recreational provision is considered to be inadequate.

15.1.7. It is also important that the socio-economic and tourism analysis takes account of the relevant local and national policy objectives. The most relevant objectives for this are expected to be included in the following strategies:

- Scottish Government (2022), Scotland's National Strategy for Economic Transformation;
- Scottish Government (2023), Scotland's National Performance Framework;
- Scottish Government (2021), Local Energy Policy Statement;
- Scottish Government (2022), Onshore Wind Policy Statement;
- Scottish Government (2023) Onshore Wind Sector Deal;
- South of Scotland Enterprise (2021) South of Scotland Regional Economic Strategy; and
- Scottish Tourism Alliance (2021), Scotland Outlook 2030.

15.1.8. It is also essential to take into consideration for the analysis NPF4, the national spatial strategy for Scotland. The document considers:

- Scotland's spatial principles;
- National planning policy;
- National developments; and
- Regional priorities.

15.1.9. In the context of energy generation, Policy 11 is relevant to the socio-economic impact of the Proposed Varied Development. Paragraph (c) states that:

"development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities".

15.1.10. The analysis will reach the conclusion on whether the project maximises the net economic impact in the context of this NPF4 Policy 11(c).

15.1.11. Paragraph (d) of Policy 11 sets out a number of impacts that should be addressed during project design and mitigation. That list does not include tourism.

15.1.12. NPF4 also introduces the concept of community wealth building in Policy 25. Specifically, it states that:

"Development proposals which contribute to local or regional community wealth building strategies and are consistent with local economic priorities will be supported."

15.1.13. Whilst NPF4 includes no requirement to consider tourism when considering net economic impact or in the project design and mitigation process, relevant employment statistics show that in Local Area the employment in tourism related sectors accounts for a higher percentage of total employment in the area (15%) compared to both Dumfries and Galloway (12%) and Scotland (11%). This indicates the importance of tourism in the local area surrounding the Proposed Varied Development and it is recognised that local stakeholders may be interested in the potential impact. A tourism analysis will therefore be included in the socio-economic report.

15.2. Socio-economic Baseline

Study Area

15.2.1. The baseline description will cover and compare the study areas of:

- Local Area (defined as the electoral wards of Castle Douglas and Crocketford, Dee and Glenkens and Mid and Upper Nithsdale);
- Dumfries and Galloway; and
- Scotland.

Baseline Description

15.2.2. The population of Dumfries and Galloway was 149,000 in 2022 (3% of the Scottish total), of which 58% were working age, lower than the figure for Scotland of 64%. Of this population, an estimated 29,700 live in the Local Area. Between 2022 and 2043, the population of Dumfries and Galloway is projected to decrease by 8.4%, compared to a 1.7% increase for Scotland as a whole.

15.2.3. The proportion of the population that is economically active is lower in Dumfries and Galloway (74%), compared to Scotland as a whole (78%), while the unemployment rate is larger, 7% compared to 3% nationally.

15.2.4. The main sectors of employment in Dumfries and Galloway are human health and social work activities (17% compared to 15% in Scotland), followed by wholesale and retail trade (15% compared to 13% in Scotland). The share of employment in construction in Dumfries and Galloway is 5%, slightly lower than the Scottish average (6%).

15.2.5. In the Local Area, around 15% of employment is tourism related sectors2, which is higher than the proportion in Dumfries and Galloway (12%) and Scotland as a whole (11%). This indicates the importance of tourism in the area surrounding the Proposed Varied Development.

15.2.6. The socio-economic and strategic baseline will be expanded on in the standalone report through a review of publicly available data sources. This will include:

- the population characteristics of the local area, including local and national demographic trends;
- deprivation statistics set within a national context;
- employment and economic activity in the local area within the context of the national economy;
- wage levels in the local area compared to the national level;
- the industrial structure of the local economy compared to the national level; and
- the role of the tourism sector in the local economy.

15.3. Consultation

15.3.1. No formal consultations are anticipated for the socio-economics study. However, any Scoping response that is relevant to socio-economics and tourism will be taken into account in the analysis.

[2] Defined as Accommodation and Food Services; and Arts, Entertainment and Recreation

15.4. Methodology

15.4.1. It is anticipated that the contents of the assessment will include:

- Introduction;
- Economic development and tourism strategic context;
- Baseline socio-economic context;
- Baseline tourism and recreation context;
- Socio-economic analysis;
- Tourism and recreation impact analysis;
- Proposed measures and actions to maximise local economic and community impacts (including Community Wealth Building); and
- Summary of findings and conclusion.

15.4.2. This will primarily be a desk-based study with consultation undertaken by the Applicant with the local community to further inform the baseline and inform any opportunities from the Proposed Varied Development which arise therein.

15.4.3. The analysis of socio-economic impacts will focus on the level of activity/employment supported during the construction and operation phases. Government and industry reports will be used to determine the expected capital and operational expenditure associated with the Proposed Varied Development, as well as the breakdown of expenditure by different contracts (e.g. turbine, balance of plant). An assumption will then be made based on the share of each type of contract that can be secured regionally and nationally. This increase in turnover will then be used to estimate the economic impact associated with the Proposed Varied Development.

15.4.4. In order to assess effects on tourism and recreation, the features that make the local area distinctive and attractive will be identified and the potential impact of the Proposed Varied Development on those key features will then be assessed.

15.5. Existing Planning Conditions

15.5.1. There are no existing planning conditions for the Consented Development that are relevant to socio-economics, tourism and recreation analysis.

15.6. Potential Mitigation

15.6.1. Proposed mitigation and enhancement measures will depend on the findings of the analysis. Proposed measures that will be adopted to enhance the socio-economic impacts include:

- Engaging early with the local community and local businesses;
- Providing clear information on technical requirements that can allow businesses to prepare; and
- Incentivising major suppliers to engage with local businesses.

15.6.2. Other measures will be identified as part of the standalone socio-economic and tourism analysis.

15.7. Potential Impacts

15.7.1. The impacts that will be considered in this assessment will include the potential socio-economic, tourism and recreation impacts associated with the Proposed Varied Development.

15.7.2. An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics; which has been used to assess over 150 onshore wind farms across the UK. The potential socio-economic impacts that will be considered are:

- temporary effects on the identified study areas due to expenditure during the construction phase;
- permanent effects on the identified study areas due to expenditure associated with the ongoing operation and maintenance of the Proposed Varied Development;
- permanent effects as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated by the development during the operational phase; and
- permanent effects on the local economy that could be supported by any community funding and/or shared ownership proposals during the operational phase of the development.

15.7.3. The link between onshore wind energy developments and the tourism sector has been a subject of debate. However, the most recent research has not found a link between tourism employment, visitor numbers and onshore wind development.

15.7.4. In 2021, this study was updated, and research identified 16 wind farms with a capacity of at least 10 megawatts that became operational between 2015 and 2019. Analysis of trends in tourism employment in the locality of these wind farms (15km radius) found that 11 of the 16 areas had experienced more growth in tourism employment than for Scotland as a whole. For 13 of the 16 windfarms, trends in tourism employment in the locality had outperformed the local authority in which they were based. This work reflected an update of previous work undertaken by BiGGAR Economics in 2017 that considered 28 wind farms constructed between 2009 and 2015 and the trends in tourism employment in the areas local to these developments. The analysis found that there was no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at the local authority level nor in the areas immediately surrounding wind farm developments.

15.7.5. Nevertheless, the tourism sector is an important contributor to the Scottish economy, and particularly in the Local Area surrounding the Proposed Varied Development where tourism related sectors account for 15% of the total employment, higher than the relative proportion in Dumfries and Galloway (12%) and Scotland (11%).

15.7.6. Therefore, there is merit in considering whether the Proposed Varied Development will have any effect on tourism behaviour and the tourism economy. This assessment will consider the potential effects that the development could have on tourism following a more focused approach on effects related to key tourist attractions and recreation assets.

15.7.7. It is not anticipated that there will be any substantial change in the impacts of the Proposed Varied Development as a result of the variation. Therefore, the changes will not be considered significant in EIA terms.

15.8. Receptors and Impacts Scoped In or Out of Assessment

15.8.1. It is proposed that any substantial, adverse impacts identified as part of the standalone socio-economic, tourism and recreation analysis will be considered as part of the EIA, and all other impacts will be scoped out.

15.9. Scoping Questions to Consultees

- Do you agree with the approach of scoping socio-economics out of the EIA and into a stand-alone report to better address the socio-economics requirements of NPF4?
- Do you agree that the scope of the proposed appraisal is appropriate?
- Are there specific socio-economic, tourism and recreation effects that should be considered?

16. Shadow Flicker

16.1. Introduction

16.1.1. This section considers shadow flicker, which is an effect caused by the rotation of the turbine blades when the sun is shining, which can create a flickering or strobe like effect. It can be distracting and disturbing for people who are affected. Effects occur usually when the frequency of the flicker is less than 1.5 Hz.

16.2. Guidance and Legislation

16.2.1. There are at present no formal guidelines available on what exposure would be acceptable in relation to shadow flicker. There is no standard for the assessment of shadow flicker. The specific advice sheet from Scottish Government, Onshore Wind Turbines, a web-based guide (Scottish Government, 2014) sets out the potential geographic area which may fall under assessment: "*Where this (shadow flicker) could be a problem, developers should provide calculations to quantify effect. In most cases however, where separation is provided between turbines and nearby dwellings (as a general rule ten rotor diameters), 'shadow flicker' should not be a problem*."

16.2.2. Dumfries and Galloway Council have produced supplementary Planning Guidance for Wind Developments (June 2017), which states:

"The potential effects of shadow flicker are considered to be site specific and depend on prevailing wind patterns among other factors. As a general rule, a minimum separation distance of 10 times the turbine rotor blade diameter from sensitive users/receptors should be maintained, however this will depend on specific locational circumstances, such as topography, and further information may be requested in this respect."

16.2.3. Published research by the Department of Energy and Climate Change (DECC), Update of UK Shadow Flicker Evidence Base (DECC, 2011), evaluates the current international understanding of shadow flicker and confirms an acceptable study area for assessment is ten rotor diameters from each turbine and within 130 degrees either side of north.

16.3. Consultation

16.3.1. No consultation has been undertaken to date in relation to shadow flicker impacts resulting from the Proposed Varied Development. Relevant stakeholders will be consulted to confirm assessment methodology and study area.

16.3.2. Relevant stakeholders were previously consulted in regard to shadow flicker impacts resulting from the Consented Development. No objections were raised. A planning condition (as outlined below) securing shadow flicker mitigation protocol was placed upon the Consented Development upon request from Dumfries and Galloway Council in their response to the Consented Development's s36 application.

16.4. Proposed Scope of Assessment

16.4.1. Potential for shadow flicker impacts will be assessed at all residential receptors within the shadow flicker study area.

16.4.2. As detailed above, the shadow flicker study area includes the area within a distance of 10 times the rotor diameter and 130 degrees either side of north for each turbine. As the Proposed Varied Development comprises larger turbine tip heights, this study area will increase in size from that used in the shadow flicker assessment for the Consented Development. The study area and any receptors which fall within it will be confirmed with Dumfries and Galloway Council.

16.5. Assessment Methodology and Potential Impacts

16.5.1. The shadow flicker assessment will be undertaken using WindPRO computer modelling software and will be run for both a worst case scenario (accounting for 365 sunshine days per year and 100 % turbine operation) and realistic scenario (using, where possible, measured meteorological data and 85% turbine operation) on the potential shadow flicker occurrence for a 1m x 1m ground floor window at each identified sensitive receptor location, assumed to be facing directly towards the Proposed Varied Development.

16.5.2. The sensitivity of the receptors will be considered to be high unless there are particular reasons for reduced sensitivity. A significant effect will be noted where a receptor is identified as experiencing greater than 30 hours of flicker a year or more than 30 minutes per day on the worst affected day (based on the realistic scenario), which ever if greater (DECC, 2011).

16.5.3. The assessment will present clear findings on the estimated number of hours of shadow flicker impact anticipated for each receptor, for both scenarios. Where required, potential mitigation measures will be discussed.

16.5.4. No impacts are anticipated during construction or decommissioning.

16.6. Existing Planning Conditions

16.6.1. The shadow flicker assessment undertaken in support of the Consented Development identified two properties that may experience shadow flicker effects. A planning condition was attached to the consent of the Consented Development in order to ensure mitigation against any potential effects associated with shadow flicker. Condition 37 states:

(1) "Prior to the erection of the first wind turbine, a scheme for the avoidance of shadow flicker effects caused by the operation of the Development shall be submitted to and approved in writing by the Planning Authority.

(2) The scheme shall be implemented in accordance with the approved details."

16.6.2. It is likely that the same or a similar condition would be suitable for the Proposed Varied Development.

16.7. Potential Mitigation

16.7.1. It is anticipated that The Applicant will implement a shadow flicker protocol during operation of the Proposed Varied Development to mitigate shadow flicker impacts enforced through an appropriately worded planning condition, as with the Consented Development.

16.8. Receptors and Impacts Scoped In and Out of Assessment

16.8.1. Residential properties within the shadow flicker study area will be taken forward for assessment.

16.9. Scoping Questions to Consultees

16.9.1. Do consultees agree that the proposed scope of assessment is appropriate?

17. Telecommunications and Utilities

17.1. Introduction

17.1.1. This section considers potential issues associated with telecommunications and utilities as a result of the Proposed Varied Development during construction, operation and decommissioning phases.

17.2. Legislation, Policy and Guidance

17.2.1. The following legislation, policy and guidance will be used to inform the telecommunication assessment.

- Best Practice Guidelines for Wind Energy Developments (British Wind Energy Association (BWEA), 1994);
- HSG 47 Avoiding Danger from Underground Services, Third Edition (Health and Safety Executive (HSE), 2014);
- Wireless Telegraphy Act (UK Government, 2006);
- Planning Advice Note: PAN 62 Radio Telecommunications (Scottish Government, 2001b);
- Guidelines for Improving Digital Television and Radio Reception (Ofcom, 2003); and
- Tall structures and their impact on broadcast and other wireless services (Ofcom, 2009).

17.3. Proposed Scope of Assessment

Telecommunications

17.3.1. Any potential effects on communication links will be sought through formal consultation with Spectrum Licensing (previously known as Ofcom) and all relevant link operators. Where possible and applicable, the turbines will be designed to take into account the minimum separation distance from identified communication link(s). An assessment will be made as to the significance of potential operational effects and where appropriate, suitable mitigation measures will be discussed.

Television

17.3.2. The closest television transmitter is New Galloway, part of the Caldbeck transmitter group and located approximately 12 km south of the Site. This transmitter has switched to digital transmission only. Currently there is no widely accepted method of determining the potential effects of wind turbines on digital television reception, however digital television signals are better at coping with signal reflections, and do not suffer from ghosting that may occur with analogue signals.

17.3.3. To date, there are very few cases of wind turbine interference with digital television reception post digital switchover. Given the strength of the digital signal in the area and the inherently resilient nature of digital television reception, there is considered to be a low risk of any interference from a wind energy development at this location on domestic television reception.

17.3.4. Due to the low risk of interference with television reception, the requirement to address any reception issues once the Proposed Varied Development is operational could be conditioned in any consent granted. For the above reasons, it is not proposed to carry out a detailed assessment of potential effects on television reception and this topic therefore will be scoped out of further assessment.

Utilities

17.3.5. Other infrastructure, such as utilities, could be affected during construction; however, implementation of best practice would ensure that these are not adversely affected during construction or operation of the Proposed Varied Development. Prior to construction, a line search for undergrounded utilities would occur and any services located and avoided.

17.3.6. During construction, there may be construction traffic passing beneath electricity lines along the transportation route. Appropriate management measures will be put in place to ensure that electricity lines are not affected by the Proposed Varied Development, and that the Proposed Varied Development is constructed in accordance with relevant health and safety legislation as appropriate.

17.4. Consultation

17.4.1. Consultation was undertaken for the Consented Development with telecommunication consultees. This consultation highlighted that the Consented Development would not interfere with telecommunications and electromagnetic signals and therefore there would be no significant effects predicted upon telecommunications as a result of the Consented Development.

17.4.2. Scottish Water and Scottish Power Energy Networks (SPEN) were previously consulted in regard to the Consented Development. No assets were identified within the Site or deemed to be impacted by the Consented Development.

17.5. Assessment Methodology

17.5.1. Telecommunication and utility providers will be re-consulted on the Proposed Varied Development however no assessment is proposed at this stage; should the need to assess potential impacts arise following consultation with relevant stakeholders, the studies will be commissioned as necessary.

17.6. Potential Mitigation

17.6.1. Should they be required; the mitigation measures will be agreed through direct dialogue between the Applicant and relevant stakeholders.

17.7. Receptors and Impacts Scoped in or out of Assessment

17.7.1. Telecommunications and utilities are determined to not be impacted by the Proposed Varied Development and are scoped out of the assessment at this stage.

17.8. Scoping Questions for Consultees

17.8.1. Do consultees agree to the decision to scope out assessment of impacts on telecommunications and utilities?

18. Health and Safety

18.1. Introduction

18.2. This section outlines health and safety considerations in relation to the Proposed Varied Development, including risk of major accidents and disasters.

18.3. Proposed Scope of Assessment

Risk of Major Accidents and/or Disasters

18.4. Given the nature of the Proposed Varied Development, and its remote location, the risk of a major accident or disaster is considered to be extremely low. The Principal Designer will ensure a Design Risk Assessment process is followed during the design phase to ensure designers fully assess risks and mitigate to a level deemed as low as reasonably practicable during the design stage as part of the requirements of the Construction (Design and Management) Regulations (2015).

18.5. During the operational phase of the Proposed Varied Development, routine maintenance inspections will be completed in order to ensure the safe and compliant operation of all built infrastructure.

Ice Throw

18.6. Icing in Scotland is likely to be a rare occurrence, with the Icing Map of Europe (WECO, 2000) showing Scotland to be within a light icing area with an annual average of only 2-7 icing days per year.

18.7. The risk associated with ice throw affecting members of the public is considered to be very low given the remote rural location of the Proposed Varied Development.

Air Quality & Human Health

18.8. The air quality of the Site is expected to be good due to the rural location, with few pollution sources. The main pollution source is likely to be local emissions from traffic on the B700 and A702.

18.9. During the construction of the wind farm, the movement of vehicles and the on-site plant would generate exhaust emissions. Given the short-term nature of the construction period and the limited area to be developed, effects on air quality are likely to be negligible.

18.10. Construction activities have the potential to generate dust during dry spells, which may adversely affect local air quality. Given the scale and nature of construction activities and given the distance between construction areas and the nearest residential properties, it is considered that dust from construction is unlikely to cause a nuisance, particularly with the implementation of standard mitigation measures as required, e.g., wheel washes; dampening of loads.

18.11. An operational wind farm produces no notable atmospheric emissions. The operation of the wind farm would therefore have no discernible adverse effects on local or national air quality.

18.12. Relevant mitigation measures for air quality, dust and pollution control will be captured within the site-specific CEMP.

18.13. The assessment of human health effects will be undertaken in the context of residential amenity (i.e., visual impact, noise and shadow flicker are scoped into the EIA).

18.14. Assessment Methodology

18.15. Health and Safety risks were considered as part of the EIA for the Consented Development, where it was assessed that the overall risk of health and safety including major accidents and disasters is considered negligible and not significant in terms of the EIA Regulations. It is not considered that the Proposed Varied Development would cause any additional health and safety risks over that already deemed negligible.

18.16. Potential Mitigation

18.17. The proposed turbines will be fitted with vibration sensors which shut the turbines down should any imbalance that might be caused by icing be detected.

18.18. To further minimise the risk, the following mitigation measures will be taken:

- Service crews will be trained regarding the potential for ice throw.
- Ice risk conditions will be monitored by the wind farm operator.
- Public notices will be displayed at access points alerting members of the public and staff accessing the Site of the possible risk of ice throw under certain weather conditions.

18.19. The risk of construction accidents as they relate to human health and safety are detailed and managed through the CDM Regulations and in the CEMP through construction method statements, which will be prepared as a condition of the Proposed Varied Development.

18.20. Receptors and Impacts Scoped in or out of Assessment

18.20.1. Health and safety considerations in relation to the Proposed Varied Development are scoped out of the assessment at this stage.

18.21. Scoping Questions for Consultees

18.21.1. Do consultees agree to that it is appropriate to scope out health and safety considerations concerning risk of major accidents and/or disasters, ice throw and air quality (including potential dust impacts) from the EIA?

19. Climate Change and Carbon Balance

19.1. Introduction

19.2. This section of the document sets out the proposed approach to the assessment of potential effects of the construction and operation of the Proposed Varied Development on carbon balance.

19.3. Calculation of the carbon footprint will be based on best practice guidelines including the Scottish Government Carbon Calculator Tool.

19.4. Proposed Scope of Assessment

19.5. A wind farm has the potential to displace electricity generated from fossil fuels during its operational lifespan and consequently prevent carbon dioxide (CO_2) from being released. All applications that are over 50 MW are dealt with through the Scottish Government's ECU in accordance with Section 36 of the Electricity Act 1989 and require a carbon balance assessment using the Scottish Government's online 'Carbon Calculator' tool, that can be used to calculate the greenhouse gas emissions and carbon payback times for wind farm developments on Scottish peatlands.

19.6. A carbon balance assessment was previously undertaken for the Consented Development and will be undertaken again for the Proposed Varied Development. The EIA will provide an estimate of the potential amount of CO_2 savings that can be made will be based on assessing the electricity generation mix that the Proposed Varied Development is displacing at any given time and the carbon released due to the construction of the Proposed Varied Development.

19.7. Assessment Methodology

19.8. A wind farm constructed on peatland habitat and/or forested land has the potential to generate CO_2 emissions as a result of the excavation and/or degradation of peat and/or forestry felling. The current best practice guidance available on the Scottish Government website provides a method to calculate carbon emission savings associated with wind farm developments on Scottish peatlands and forested land using a full life cycle analysis approach using a web-based application. The tool was originally published in 2008 and the latest update made in December 2023 (Scottish Government, 2023). The tool compares the carbon costs of wind farm developments with the carbon emissions savings attributable to the wind farm. The calculation is summarised as the length of the time (in years) it will take the carbon savings to amount to the carbon costs also referred as the "payback period". An assessment of effect of significance will not be undertaken but the volumes of CO_2 savings and emissions will be provided in the EIA Report chapter.

19.9. Potential Mitigation

19.10. As part of the design process for the Consented Development, the turbines were sited to avoid areas of deep peat, and measures to minimise peat disturbance especially during excavation will continue to be taken into consideration during the design process of the Proposed Varied Development. Best practice measures will also be considered to minimise peat disturbance during construction and decommissioning that will be provided as a part of the CEMP.

19.11. Scoping Questions for Consultees

19.12. Do you agree with the above methodology for assessing carbon emissions and savings as a result of the Proposed Varied Development?

20. Summary

20.1. This EIA Scoping Report outlines the proposed technical and environmental assessments that will be included within the EIA Report for the Proposed Varied Development. **Table 20.1** summarises these and indicates the technical topics which have been scoped out of the EIA Report. The proposed scope and methodologies for each assessment have been provided and the guidance to be followed set out. Should any further information be required in order that a full EIA Scoping Opinion can be provided we would be happy to provide further information and/or discuss any further requirements.

Table 20.1 Technical topics scoped In and Out of the EIA Report

EIA Topics	Scoped In or Out
Planning and Energy Policy	Scoped In
Forestry	Scoped In
Landscape and Visual	Scoped In
Ecology	Scoped In
Ornithology	Scoped In
Cultural Heritage	Scoped In
Geology and Peat	Scoped In
Hydrology and Hydrogeology	Scoped In
Noise and Vibration	Scoped In
Traffic and Transport	Scoped In
Aviation	Scoped In
Socio-economics, Recreation and Tourism	Scoped Out (standalone analysis proposed)
Shadow Flicker	Scoped In
Telecommunications and Utilities	Scoped Out
Health and Safety	Scoped Out
Climate Change and Carbon Balance	Scoped In

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Appendix 9.1 Gazetteer of Heritage Assets

Provided separately.

Figures

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