

Proposed Five Turbine Wind Farm

Cairnmore Hill, Caithness

Environmental Impact Assessment Scoping Report

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Glossary and Abbreviations

Term	Definition
The Applicant	Client/developer (RES).
The Proposed Development	The scheme, the development, the proposal, the development proposal, the proposed development scheme, the wind farm, the proposed wind farm ...etc. (Cairnmore Hill Wind Farm).
The Site	The project site, the site, development area, developable area, red line boundary, the proposed wind farm site.
Scoped in	Included in the proposed scope of the EIA
Scoped out	Excluded in the proposed scope of the EIA
HWLDP	Highland-wide Local Development Plan
THC	The Highland Council
AM	Amplitude Modulation
ATC	Automatic Traffic Count
BEIS	Business, Energy & Industrial Strategy, formerly The Department of Energy & Climate Change
BERR	Business, Enterprise and Regulatory Reform
BGS	British Geological Survey
CAA	Civil Aviation Authority
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecological and Environmental Management
CifA	Chartered Institute for Archaeologists
CoPA	The Control of Pollution Act
CRM	Collison Risk Modelling
dB	Decibel
DfT	Department for Transport
DTI	Department of Trade and Industry
DTM	Digital Terrain Modelling
DWQR	Scottish Water Quality Regulator
ECow	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	The Environmental Protection Act
ES	Environmental Statement
GDL	Gardens and Designed Landscapes
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPG	Good Practice Guide
GPP	Guidance for Pollution Prevention
GWDTE	Ground Water Dependent Terrestrial Environment
Ha	Hectare
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HLAMap	Historic Land-Use Assessment Data for Scotland
HMP	Habitat Management Plan
HRA	Habitat Regulations Appraisal
HSE	Health & Safety Executive
IEA	Institute of Environmental Assessment
IEF	Important Ecological Features
IOA	Institute of Acoustics
Km	Kilometres
LA90	The A-weighted noise level exceeded for 90% of the time, often used to describe background or wind turbine noise as it excludes transient noises that affect the LAeq.

Term	Definition
LBAP	Local Biodiversity Action Plan
LCT	Landscape Character Type
LDP	Local Development Plan
LFA	Low Flying Area
LUPS	Land Use Planning Guidance
LVIA	Landscape and Visual Impact Assessment
M	Metre
MoD	Ministry of Defence
MW	Mega Watt
NCAP	National Collection of Aerial Photography
NCN	National Cycling Network
NCU	Nature Conservation Value
NERL	NATS (En Route)
NNR	National Nature Reserve
NP	National Park
NPF	National Planning Policy
NRHE	National Record of the Historic Environment
NVC	National Vegetation Classification
OWENSG	Onshore Wind Energy Non-Statutory Guidance
PPG	Pollution Prevention Guidelines
PPP	Pollution Prevention Plan
PWS	Private Water Supply
RSA	Regional Scenic Area
RSPB	Royal Society for the Protection of Birds
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
Scotways	Scottish Rights of Way and Access Society
SEPA	Scottish Environment Protection Agency
SG	Supplementary Guidance
SLA	Special Landscape Area
SLCAWE	Strategic Landscape Capacity Assessment for Wind Energy
SLVIA	Seascape, Landscape and Visual Impact Assessment
SM	Scheduled Monument
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
TA	Technical Appendices
UK-BAP	United Kingdom Biodiversity Action Plan
VP	Vantage Point
WFD	Water Framework Directive
WLA	Wild Land Area
WTAMR	Wind Farm Turbine AM Review
ZTV	Zone of Theoretical Visibility

1 Introduction

RES “the Applicant”, is proposing to construct a new onshore wind farm to generate renewable electricity from wind power. The proposed development is located approximately 4.5 km northwest of Thurso, on the north coast of Caithness in the Scottish Highlands (see Figure 1.1).

The proposals for which consent under Town and Country Planning (Scotland) Act 1997, as amended¹ (the 1997 Act) will be sought by the Applicant, are referred to in this report as ‘the Proposed Development’ and are described below. The application for Town and Country consent is being prepared by RES.

An application to construct and operate an 8 turbine wind farm and associated works on the site was submitted to The Highland Council in October 2020 (the ‘2020 application’). The Highland Council refused this application in March 2021, as it was deemed the application would have detrimental impacts on the landscape qualities, visual impacts and residential amenity impacts.

As the site offers excellent potential for a wind farm development due to its wind resource and proximity to existing wind development, the Applicant proposes to review and optimise the design of the wind farm, taking into consideration concerns previously raised about the prominence and proximity of turbines in views from residential properties.

Following a review of previous concerns and preliminary technical analysis, it is anticipated that an installed capacity in excess of 20 MW could be achieved in the proposed development area (see Figure 1.2). This would be subject to further technical and environmental review throughout the Environmental Impact Assessment (EIA) process.

An Environmental Impact Assessment Report (EIA-R) will be required to accompany the Town and Country Application under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (“the EIA Regulations”), as the Proposed Development comprises a wind farm with a generation capacity greater than 20 MW and for which Town and Country consent is required. It is therefore considered to fall within the definition of Schedule 2 development contained in Regulation 2(1) of the EIA Regulations. The Developer has voluntarily agreed to prepare an EIA-R in accordance with the EIA Regulations, rather than requesting a Screening Opinion.

1.1 Purpose of this scoping report

For this application RES propose to begin stakeholder consultation into the scoping stage in order to provide information on the proposed development area’s baseline conditions and the possible impacts from the development. Therefore, this report utilises the existing information, experience from the existing wind farm and data gathered to date to focus on key areas and likely significant effects in agreement with consultees. Other minor and non-significant issues will be scoped out, and thus not included within the final submission in the EIA-R.

As a consequence of this extensive use of existing data, this scoping document provides an in-depth understanding of the baseline and provides evidence to enable key consultees to focus on key areas, likely significant effects and to the ‘scoping out’ of minor and not significant issues.

¹ As amended by the Planning etc. Scotland Act (2006).

Whilst this larger scoping report will inevitably require more engagement from key consultees at an early stage, the eventual EIA-R submitted should be more streamlined than previous submissions and focus on only likely significant effects. The applicant will ensure that regular and continued liaisons with key stakeholders (including the community) are carried out and documented to agree the assessment baseline, methodology and thus the EIA process and final EIA-R documents will be more efficient and streamlined.

1.2 Consultation

This report is provided to The Highland Council and other stakeholders in support of a request by RES for a 'Scoping Opinion' regarding the information to be provided within the EIA-R which will accompany an application for Planning Permission.

The specific objectives of this report are to:

- Seek agreement on the likely significant effects associated with the Proposal at Cairnmore Hill to ensure that all likely significant effects have been correctly included in the proposed scope of the EIA ('scoped in');
- Seek agreement where known non-significant effects will be excluded ('scoped out'); and
- Invite comment on the proposed approach to baseline data collection, prediction of environmental effects and the assessment of significance. The scoping report will be provided to the consultees set out in Table 1-1.

Table 1-1 EIA Consultees

Statutory Consultees	Non-Statutory Consultees
Caithness West Community Council	Association of Salmon Fisheries
Historic Environment Scotland (HES)	Civil Aviation Authority
NatureScot	Communications Providers (including Three, O2, EE (Everything, Everywhere), Vodafone, Airwave, Arqiva, Atkins, BBC, Channel 5, CSS Spectrum Management Services Ltd, BT and Joint Radio Company (JRC))
Planning Services	Health and Safety Executive
Road and Transport	Highlands & Islands Airport
Scottish Government	Marine Scotland
Scottish Environment Protection Agency (SEPA)	MoD Defence Infrastructure Organisation
The Highland Council	National Air Traffic Services
Thurso Community Council	Nuclear Safety Directorate
	Royal Society for the Protection of Birds (RSPB)
	Scottish Rights of Way Society
	Scottish Water
	Scotways
	Scrabster Harbour Trust
	The Crown Estate
	Transport Scotland
	Visit Scotland

Given the nature of the site and the proposals, the following bodies are not deemed relevant consultees:

- Forestry Commission Scotland;
- Mountaineering Council of Scotland; and
- John Muir Trust.

2 Approach to Environmental Impact Assessment (EIA)

The EIA is a statutory procedure which draws together in a systematic way an assessment of the likely significant environmental effects arising from a proposed development.

As the process has numerous steps as set out below, it allows for the opportunity to ‘design out’ adverse environmental effects at an early stage through the design of the project. This of course is preferable to mitigation or remedy at a later stage.

An iterative design approach is already in process for this project and will continue to be adopted throughout the EIA process, which will allow the proposed development to have adopted a design that works well for both the local environment and environmental resources within the area as well as being an economically viable scheme.

For this particular project the collection of the baseline data has, for the majority, been completed. Therefore, RES has a comprehensive understanding of the site and the local vicinity. Likewise, statutory and non-statutory consultees will also be aware of the environmental resources in the area, and the possible impacts from the proposed development. This has allowed for the design identified within the Scoping Report to have ‘designed out’ impacts to the environment already.

The information within this Scoping Report will provide consultees with the information to agree on those features and topics that are likely to experience a significant effect, and thus ‘scope out’ the rest. In doing so the impact assessment will be focused and proportionate to those that will actually influence the decision as to whether to not the project should receive consent.

The impact assessment will determine for those assessed receptors what the effect, either directly or indirectly will be from the project, by comparing the baseline conditions with the conditions that would prevail should the proposed development be constructed, operated (and decommissioned). The environmental effects of the project will be predicted in relation to environmental receptors (i.e. people), built resources and natural resources.

A distinction will be made in the assessments between impacts and effects, where:

- Impacts are defined as the predicted change to the baseline environment attributable to the scheme; and
- Effects are the consequence of impacts on environmental resources or receptors.

2.1 What will the EIA assess?

The EIA will address the construction phase of the wind farm, the operational phase which would last approximately 35 years, and the decommissioning phase. The geographical coverage of the EIA will take account of the following:

- The physical extent of the proposed works;
- The nature of the baseline environment and the manner in which effects are propagated; and the
- National and Local planning and policy context for the scheme.

2.2 Gathering baseline information

The vast majority of the baseline data has already been collected for this project, the assessment team will ensure that sufficient data is obtained to enable a robust assessment, appropriate to the nature and scale of the proposed works. The extent of the baseline assessment will be determined using both professional judgement and industry best practice. The EIA will also identify areas where the baseline may change, prior to the construction and operational phases of the proposed development from current conditions (for example, maturation of landscaping).

The collection of baseline data will be achieved through desk study (including the use of data gathered for the previous developments in the area), consultation, field survey and monitoring and will be clearly reported in the subsequent sections, or within the EIA-R (should there be an expected significant impact from the development). In line with the regulations, the EIA-R will also indicate any difficulties encountered in compiling environmental baseline conditions; such as access to land to carryout surveys where permission was not granted.

2.3 Prediction and evaluation of Impacts and effects

The prediction of impacts examines the change to the baseline environment that could result from the construction and operation of the scheme. The effects will be classified into one or more of the following:

- Positive effects that have a beneficial influence;
- Negative effects that have an adverse influence;
- Temporary effects that persist for a limited period only, due for example to particular construction activities;
- Permanent effects that result from an irreversible change to the baseline environment or which persist for the foreseeable future;
- Direct effects that arise from activities that form an integral part of the proposed development;
- Indirect effects that arise from activities not explicitly forming part of the proposed development;
- Secondary effects that arise as a result of an initial effect of the scheme; and
- Cumulative effects that arise from the combination of different impacts at a specific location, the recurrence of impacts of the same type at different locations, the interaction of different impacts over time, or the interaction of impacts arising from the scheme in conjunction with other development projects.

There is no statutory definition of what constitutes a significant effect. A significant effect may be broadly defined as an effect which, either in isolation or combination with others, should be taken into account in the decision-making process. This general definition will be used as the basis against which the significance criteria for environmental disciplines will be developed. The threshold of significance for predicted effects tends to vary between the environmental topics. The assessment team will ensure that a consistent approach is applied where suitable to prevent undue weight being given to a particular discipline to the detriment of another.

2.4 Mitigation of environmental effects

The proposed development has been designed and will be developed with best practice methodologies (e.g. construction processes and methodologies set out in the Construction Method Statement (CMS) are embedded into the project design) to reduce any potential significant effects as far as practicable from the initial stages of the development. Mitigation measures will be considered for each significantly adverse effect. The EIA-R will include a description of the measures envisaged to prevent, reduce and where possible remedy any significant adverse effects. In line with the regulations, when identifying mitigation measures, the proposed development will take into account the practicability and cost effectiveness of the proposals and their efficiency in reducing environmental impacts. Where practical, mitigation measures will be set out as commitments which will ensure they are implemented. Where the effects of the impact are significant, and where there is uncertainty in the mitigation, monitoring may be proposed to ensure that the mitigation is both required and effective. Monitoring will allow for adaptation of the mitigation measures to ensure that they are fit for purpose. Monitoring will be proportionate to the level of significance experienced and not simply proposed as monitoring for monitoring sake. Once the final design has been adopted and account has been taken of any mitigation measures, residual effects will be listed. The significance of a residual effect will be determined by correlating the magnitude of the change arising from the scheme with the sensitivity of the particular attribute under consideration. The magnitude of change will be evaluated in accordance with Table 2-1

Table 2-1 Magnitude of change

Magnitude	Description
High	Total loss or major alteration to key elements/features of the baseline conditions
Medium	Partial loss or alteration to one or more key elements/features of the baseline conditions
Low	Minor shift away from the baseline conditions
Negligible	Very slight change from baseline conditions

Where applicable in carrying out individual assessments, a scale of increasing sensitivity of the resource or receptor will be defined. This may be defined in terms of quality, value, rarity or importance and can be classed as 'Low', 'Medium' or 'High'. For certain assessment areas, guidance will be taken from the value attributed to elements through designation or protection under law. Where assessment of this nature takes place the correlation of magnitude against sensitivity will determine a qualitative expression for the significance of the residual adverse effect. This is demonstrated in the matrix below in Table 2-2:

Table 2-2 Significance of effect

Magnitude of Impact				
Receptor sensitivity		Low	Medium	High
	High	Moderate	Moderate / Major	Major
	Medium	Low/Moderate	Moderate	Moderate / Major
	Low	Low	Low/Moderate	Moderate
	Negligible	Negligible/Low	Low	Low/Moderate

Those residual adverse effects indicated as Major and Moderate/Major will be regarded as being significant effects in terms of the relevant legislation. However, other factors may have to be considered including the duration and the reversibility of the effect.

2.5 Securing commitments and mitigation through planning conditions

Where commitments and mitigation have been discussed within this scoping report they will form part of the EIA-R and therefore ensure that they are addressed if the proposal receives consent through specific planning conditions

2.6 Environmental impact assessment Report (EIA-R)

The EIA process will result in the production of an Environmental Impact Assessment Report (EIA-R). The EIA-R will identify those features/ receptors that have been agreed are likely to have a significant effect from the proposed development (or cumulatively with other projects) and will make an influence on their decision process. The EIA-R will focus on each of the broad topics identified within this Scoping Report, plus any others that develop throughout the remainder of the EIA process until submission. Where features are considered, the assessment methodology, results, effects and mitigation proposed (if any) will be included.

This will allow for the residual effect from the proposed development to be identified to allow the competent authority sufficient information to determine the application. The EIA-R will supplement the application and will also be accompanied by a Carbon Balance Assessment, a Non-Technical Summary (NTS), a Pre-Application Consultation (PAC) Report and a Planning, Design and Access Statement (PDAS).

The EIA-R is likely to follow the structure below:

Background Information

Chapter 1: Introduction

Chapter 2: Proposed Development

Chapter 3: Site Selection and Design Evolution

Chapter 4: Approach to EIA

Physical Environment

Chapter 5: Landscape and Visual Impact Assessment (LVIA)

Chapter 6: Cultural Heritage Assessment

Biological Environment

Chapter 7: Ecology Assessment

Chapter 8: Ornithology Assessment

Chapter 9: Geology, Hydrology and Hydrogeological Assessment

Population and Human Health

Chapter 10: Traffic and Transport Assessment

Chapter 11: Noise

Chapter 12: Safety and Other Issues

Chapter 13: Potential Grid Connection

Climate Change

Chapter 14: Climate Change

Chapter 15: Schedule of Environmental Mitigation

Conclusion

Chapter 16: Residual, Synergist Effects & Mitigation and conclusions

The EIA-R will be produced both in a hard copy print and electronically. For the majority of consultees, unless otherwise requested, the EIA-R will be provided electronically. Due to the Government guidance issued as a result of the COVID-19 pandemic, face-to-face consultation is unfortunately not possible at present and may not be permitted for the foreseeable future. The Scottish Government has brought forward regulations (The Electricity Works (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020) during this period which replaces the requirement for a physical, face-to-face public event with an alternative, online version. An NTS will be submitted alongside the EIA-R, which will provide a summary of the main findings and will be written in a non-technical language to help enable a better understanding and overview of the assessments for the general public.

2.7 Embedded mitigation and further layout iterations

The design of Cairnmore Hill Wind Farm to date has been an iterative process, and the layout of which has avoided environmental and physical constraints as far as possible (embedded mitigation). Throughout the remainder of the EIA process (until the submission of the EIA-R), it may be that the layout presented here in the Scoping Report, further develops (especially in light of the Scoping Opinion and public consultations). Should the layout change from now to the application, it should be noted that the layout presented within this Scoping Report represents a 'worst case scenario' (e.g. turbines have been presented in the greatest number and tallest height) and therefore the proposal as identified now will have the greatest environmental impacts, and generally any amendments to the design will further reduce potential significant effect.

Should any changes occur that are likely to have a significant effect on the receptor these will be included within the EIA. If the changes are not likely to have a significant effect, these will first be discussed with the relevant consultees, to ensure that they too are in agreement with the applicants' understanding before excluding them from the EIA-R.

In the following sections the subject areas to be covered in the Scoping Report and EIA-R are provided. Where it is considered that certain subjects or particular aspects within subjects can be scoped out of the EIA-R, evidence and a rationale is provided

3 Development Description

3.1 Proposed Wind Farm

The main elements of the Proposal are expected to be as follows:

- Up to 5 wind turbines, each up to a maximum tip height of 138.5m;
- at each turbine, associated transformers, and related switchgear;
- turbine foundations;
- hardstand areas for erection and maintenance cranes at each turbine location;
- one permanent freestanding meteorological mast;
- a series of on-site tracks with associated water crossings;
- a site access route with any necessary road improvement works from the public road network;
- a control building and substation compound and communications mast;
- a network of buried electrical cables;
- temporary construction compound and laydown areas; and
- energy storage unit and associated infrastructure.

3.1.1 Wind Turbines

The turbine's maximum tip height from base to tip would be 138.5 m. The indicative capacity of each turbine is up to 4.3 MW, and the overall wind farm capacity would be approximately 21 MW. This reflects the ongoing development of wind turbine technology as well as the potential wind resource that exists in this area.

3.1.2 Turbine Foundations

The turbines will be fixed to reinforced concrete foundations, typically up to 20 m in diameter. The foundations will be formed in excavations approximately 3.5 m deep, depending upon ground conditions. Prior to excavation, topsoil and existing vegetation will be lifted and stored. After completion the foundations will be backfilled with suitable excavated or imported material and the original vegetation will be reinstated where possible if it is considered ecologically sensitive. Concrete for site construction, including turbine foundations, would most likely be brought in from a local off-site batching facility.

3.1.3 Transformers

Turbines typically generate at 690 V. In order to prevent cable losses and to minimise cable diameter, the voltage would be increased to 33 kV by transformers at each turbine. Depending on the turbine model selected for the project, these transformers may be housed within the turbine tower or in a small container sited on a concrete slab alongside the turbine.

3.1.4 Electrical Cabling

The turbines would be electrically connected to the control building by means of 33 kV cables. These cables would be laid underground in trenches generally running adjacent to the site tracks, leading to the

on-site control building. These trenches would be backfilled with retained excavated material, marked with buried safety warning tape and have the original vegetation reinstated.

3.1.5 On Site Substation & Control Building

The electrical cables would terminate at the substation. Located adjacent to the substation would be a control building. In total these units would measure approximately 50 m x 80 m with a pitched roof up to 5.5 m, containing switchgear, control equipment and basic welfare facilities, including a toilet.

3.1.6 Access and Site Tracks

Given the location of the site, it is most likely than turbine components would be delivered from the Port of Scrabster. Access to site would be taken from a new entrance off the A836. Access to the site is proposed via a new priority junction with the A836 at a location approximately 5 km west of the A9 trunk road ('T'). Existing tracks on the site itself would be utilised wherever reasonably practicable. New and upgraded tracks would be typically up to 5.5 m wide with appropriate widening at bends and passing places dependent on-site conditions. The verges of the tracks would be reinstated as appropriate after construction.

3.1.7 Crane Hardstands

The turbines would be erected using mobile cranes. These require areas of hardstand adjacent to the turbine locations, which can support the load of the cranes on their outriggers. The permanent hardstands, typically up to approximately 30 m by 50 m dependent on-site conditions, and approximately 550 m² of temporary hardstands at each turbine, are formed by excavating soft ground, and infilling with compacted stone. Temporary hardstand areas would be required for laydown of turbine components and for a small support crane to assist the main erection crane.

3.1.8 Construction Compound

At least one site compound of approximately 50 m by 80 m, would be required to contain temporary site offices and other services including sealed waste storage and toilet facilities; sufficient parking for cars and construction vehicles; containerised storage facilities; and a receiving area for incoming vehicles. After construction, the compound would be removed and the site cleared of stone, with the ground re-graded to a natural profile and reinstated.

3.1.9 Energy Storage

In order to match on-site energy generation to energy demand, as well as facilitate the reduction in any possible grid constraint requirements and provide ancillary services to the grid, the Proposal will also provide for the provision of energy storage. This will consist of a number of permanent containers containing batteries, mounted on small concrete foundations.

The exact location and number of energy storage devices will be determined through the design process and will consider all relevant technical and environmental sensitivities.

3.1.10 Construction and Environmental Management

The proposed construction works would be set out in the EIA-R, including anticipated details of timescales, traffic generation and construction phasing. The EIA-R would also contain details of appropriate

environmental management measures, including pollution prevention measures (in line with SEPA's Pollution Prevention Guidelines (PPGs)), and waste minimisation and management measures. It is currently estimated that construction would take approximately 12 months from award of contract; however, this would be subject to environmental and weather constraints which could extend this period. The main phases would include:

- access route road improvements;
- site entrance construction;
- construction/upgrade of on-site access tracks;
- construction of temporary construction compound and hardstands;
- construction of turbine foundations, requiring the import of concrete and steel;
- construction of the substation, control building and battery storage compound;
- excavation of trenches and laying of cables;
- connection of distribution cables;
- delivery and erection of wind turbines;
- commissioning of site equipment; and
- site demobilisation and restoration.

Some of these activities would be carried out concurrently in order to reduce the length of the construction program. Site restoration would be conducted as early as possible. Vehicle movements associated with construction works would include:

- cars and minibuses for transporting construction personnel to the site;
- heavy goods vehicles (HGVs) for pre-construction delivery of site offices, construction equipment and materials;
- HGV abnormal load vehicles for delivery of the turbine components and base rings;
- mobile road going cranes, used for the erection of the turbines; and
- standard HGVs for transporting electrical cable, steel reinforcement for foundations, construction plant fuel and other items and equipment.

A Traffic Management Plan would be agreed in consultation with The Highland Council and Transport Scotland and other stakeholders (including the local communities and Scrabster Harbour Trust). This would address the scheduling, routing and overall management of abnormal loads movements along with the programming and management of all other HGV movements.

3.1.11 Operation and Maintenance

Turbines typically have an operational life of 35 years. A wind farm is typically visited up to four times a month by a maintenance team. There would also be a requirement for maintenance of the access tracks and substation.

3.1.12 Decommissioning

On completion of the operational life of the proposed wind farm, the turbines could be removed, reconditioned, or replaced, and appropriate site restoration measures implemented. If the desire is to retain a wind farm, a new associated planning application would be required.

4 Planning and Energy Policy Context

4.1 Introduction

This section provides an overview of the planning policy context for the Proposed Development. A more detailed discussion and evaluation of relevant policies will be included within the Planning Statement that will be provided as a supporting document with the Application. An up-to-date list of relevant planning policies will be contained within the EIA-R.

4.2 National Planning Policy

4.2.1 National Planning Framework 3

National Planning Framework (NPF) provides a framework for long-term spatial development in Scotland. The third NPF (NPF3) (Scottish Government 2014a) was laid before the Scottish Parliament and approved in June 2014. NPF3 sets out the Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy. The central vision is set out over four key policy objectives for Scotland to be: a successful, sustainable place; a low carbon place; a natural, resilient place; and, a connected place.

At the time of writing, the draft NPF4 was published by the Scottish Government in November 2021. The document is in consultation until March 2022 with the Scottish Government intending to adopt the NPF in the summer recess 2022.

4.3 Scottish Planning Policy

Scottish Planning Policy (SPP) was published by the Scottish Government in June 2014 (Scottish Government 2014b) and sets out a national policy framework for land use planning. Guidance regarding renewable energy including onshore wind farms is contained within 'A Low Carbon Place' (paragraph 161- 166). This consolidated document supersedes previous Scottish Planning Policies (SPPs) and National Planning Policy Guidelines (NPPGs).

4.3.1 Onshore Wind Policy Statement and Scottish Energy Strategy

The Scottish Government published Onshore Wind Policy Statement (Scottish Government 2017a) in December 2017 alongside the Scottish Energy Strategy (Scottish Government 2017b). It considers the various issues facing the sector and actions being taken to mitigate these concerns. The Scottish Energy Strategy sets a 2030 target for the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied by renewable sources. This builds on the previous target set in 2009, which required 30% of Scotland's heat, transport and electricity needs to be met by renewable sources.

The Onshore Wind Policy Statement Refresh 2021 was published by the Scottish Government in October 2021 which is in consultation until January 2022.

4.3.2 Scottish Government web-based Renewables Guidance

Onshore Wind Turbines (Scottish Government 2014c) provides greater clarity and focus for planning authorities in locating wind farms and assessing wind farm applications. It also places emphasis on the importance of pre-application discussions.

4.3.3 The Climate Change (Scotland) Act 2009²

This act creates the statutory framework for greenhouse gas emission reductions in Scotland, which was then amended in 2019 with the Climate Change (Emissions Reduction Targets) (Scotland) Act (2019)¹⁹ to introduce the commitment for Scotland to become net-zero by 2045.

4.3.4 Update to the Climate Change Plan 2018 -2032: Securing a Green Recovery on a Path to Net Zero³

This plan updates the Scottish Government's legislative commitment to reduce emissions by 75% by 2030 and to reach net-zero by 2045. Embedded within these targets is a focus to evolve and update policy that will continue the growth of renewable energy generation.

4.3.5 Local Planning Policy

The site lies entirely within the jurisdiction of The Highland Council. The Proposed Development would be considered against the following Local Development Plan documents:

4.3.6 Highland-wide Local Development Plan

The Highland Wide Local Development Plan (HwLDP) 2012 provides the local planning framework for the area and provides the general policy context against which the Proposed Development would be assessed. It is anticipated that the proposal will be guided primarily by the following key HwLDP policies: Policy 57 (Natural, Built and Cultural Heritage), Policy 61 (Landscape) and Policy 67 (Renewable Energy Developments).

4.3.7 Area Local Development Plan

The Caithness and Sutherland Local Development Plan (CaSPlan) (adopted 2018) also forms part of the development plan. It replaces the Caithness Local Plan and Sutherland Local Plan and is used to guide decisions on planning applications. It sets out the policies and land allocations to guide development over the next 10-20 years.

4.3.8 Supplementary Guidance

The Highland Council has also developed Supplementary Guidance (SG), of particular relevance being the Onshore Wind Energy SG (November 2016). Table 1 of SPP '*Spatial Frameworks*' shows areas where wind farms will not be acceptable (Group 1), areas of significant protection (Group 2) and areas with potential for wind farm development (Group 3). The site lies wholly within Group 3 (areas with potential for wind farm development).

² <https://www.legislation.gov.uk/asp/2009/12/contents>

³ <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>

5 Landscape and Visual

5.1 Introduction

The purpose of the Landscape and Visual Impact Assessment (LVIA) is to identify, predict and evaluate potential impacts on landscape fabric, character and visual amenity within the site and at a distance of up to 40 km from the outermost turbine. It will also consider potential cumulative effects, as defined in NatureScot's (formerly SNH) guidance on 'Assessing the Cumulative Impact of Wind Farms' (March 2012).

The assessment will involve desk study, field work, data processing and analysis as well as interpretation using professional judgment.

The Proposed Development comprises an optimised layout (5 turbines at 138.5m to tip height, but noting this may be subject to change) revised from the original application (8 turbines at 138.5m to tip height) considered in the 2020 Cairnmore Hill Wind Farm Environmental Statement and associated LVIA. The application for the 8 turbine scheme has been refused.

The Proposed Development will introduce a number of elements to the landscape which have the potential to generate significant effects on the landscape and visual amenity of the site and surrounding area. These include elements associated with the construction, operation and decommissioning. Operational effects will be the longest in duration and associated with the following elements:

- wind turbines;
- anemometer mast;
- access tracks
- energy storage;
- a substation and compound; and
- a control room and compound.

The scale of these elements, in particular the wind turbines, also means that they are likely to be visible from a wide area within the surroundings, with consequent potential for effects on visual amenity and wider landscape character. The LVIA will therefore address impacts on the wider study area. The LVIA will consider effects on:

- landscape fabric, caused by changes to the physical form of the landscape and its elements;
- landscape character, caused by changes in the key characteristics and qualities of the landscape as a result of the Proposed Development, including effects on designated landscapes (National Scenic Areas and Special Landscape Areas) and Wild Land; and
- visual amenity, caused by changes in the appearance of the landscape as a result of the Proposed Development.

Impacts on landscape fabric occur when there is physical change to components of the landscape, including the landform, land use or land cover. Impacts on landscape character occur when there is change to the key characteristics of any landscape and the distinct and recognisable pattern of elements which give it a

particular character. Visual impacts comprise changes in elements of views and the related effects on visual amenity. Key issues to be considered in the LVIA will include:

- potential effects on the landscape character of the study area and visual amenity, including tourist and recreational uses/interests and sequential effects.
- potential effects on landscape designations/sensitive landscapes such as Special Landscape Areas; and
- cumulative interactions with wind farm developments in the Highlands (operational, consented and proposed wind farms) and the potential implications for the landscape to accommodate the Proposed Development.

5.2 Consultation

Representatives of The Highland Council (THC) and NatureScot will be further consulted in order to confirm the scope of the LVIA and methodology to be used in the LVIA, as well as the number and location of representative viewpoints to be assessed. Representative viewpoints are informed by the viewpoint list put forward in the 2020 LVIA and will be selected to consider views from settlements, recreational routes/cycleways, road and rail routes, and formal vantage points. The proposed viewpoints will be informed by the findings of Zone of Theoretical Visibility (ZTV) plans for the Proposed Development, augmented by findings from fieldwork. A preliminary ZTV (138.5 m to blade tip height) drawing is included as Figure 5.1.

5.3 Baseline Assessment

A description of the existing landscape and visual context of the study area will be prepared against which to judge the potential effects of the Proposed Development. This will be based on a desktop review of mapping, aerial photography and available information (including the NatureScot web based 2019 National Landscape Character Assessment and 'An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms' 2005 report) and fieldwork. Further baseline data sources include:

- OS Terrain 5;
- OS 1:25,000 Raster Mapping;
- OS 1:50,000 Raster Mapping;
- OS 1:250,000 Raster Mapping;
- OS Meridian 2 data;
- OS Address Layer 2 data
- OS VectorMap District mapping; and
- OS Landuse/landcover mapping.

The baseline appraisal will also consider relevant planning policy and strategic guidance context, including:

- SNH (2017) Siting and Designing Wind Farms in the Landscape, Version 3a;
- SNH (updated 2009) Policy Statement No 02/02: Strategic Locational Guidance for Onshore Windfarms in Respect of the National Heritage;

- SNH (2015) Constructed Tracks in the Scottish Uplands, 2nd Edition;
- SNH (2019) Good Practice During Windfarm Construction, Version 3;
- Scottish Government (2014) Scottish Planning Policy;
- Scottish Government (2017) Scottish Energy Strategy: The Future of Energy in Scotland;
- Scottish Government (2021) Onshore Wind Policy Statement Refresh 2021;
- Scottish Government (2021) Our Fourth National Planning Framework (NPF4);
- Scottish Government (2003) Planning Advice Note (PAN) 68: Design Statements;
- SNH (2015) Spatial Planning for Onshore Wind Turbines - Natural Heritage Considerations.
- THC (2012) Highland-wide Local Development Plan;
- THC (2016) Onshore Wind Energy Supplementary Guidance; and
- THC (2006) Highland Renewable Energy Strategy and Planning Guidelines.

The baseline study will identify, review and assess the following:

- topography, land use and landcover at the site and across the wider study area;
- the landscape character of the site and its surroundings, including seascape and coastal character;
- sensitive landscape receptors, including designated landscapes and areas of Wild Land;
- key visual elements including skyline, enclosure, focal points; and
- the location and distribution of key visual receptors, including those within settlements, on key transportation and recreational routes, visitor attractions and vantage points.

The LVIA will incorporate an assessment of potential cumulative effects arising from the relationship between the Proposed Development and operational, constructed, consented and proposed wind farms within 40 km of the site, that are capable of contributing to significant cumulative effects.

Further fieldwork will be carried out to refine the landscape, seascape and coastal character assessments of the study area and to visit each of the agreed viewpoints, to assist the assessment process.

5.4 Assessment Methodology

5.4.1 Landscape Effects

Predicted changes to both the physical landscape of the site and landscape character within the 40 km study area will be identified. The assessment of landscape effects will take account of the sensitivity of the landscape, acknowledging any value placed on the landscape through formal designation at either a national or local level.

Landscape effects will be determined in relation to the magnitude of change (nature of effect), in accordance with GLVIA 3.

5.4.2 Visual Effects

Visual effects are experienced by people (visual receptors) at different locations across the study area, including at static locations (for example from settlements or promoted viewpoints) and transitional locations (such as sequential views experienced from routes, including roads, footpaths or cycle routes). Visual receptors are the people who will be affected by changes in views at these places, and they are usually grouped by what they are doing at those locations (for example residents, motorists, recreational users etc.).

Visual effects resulting from the Proposed Development will be considered within the context of the existing baseline conditions, including operational and under construction wind farms. The assessment of visual effects arising from the introduction of the Proposed Development will be based on analysis of turbine hub and blade tip height ZTVs, field studies and consideration of changes in views from representative viewpoints.

5.4.3 Cumulative Effects

The cumulative landscape and visual assessment (CLVIA) will be carried out in accordance with the principles outlined in GLVIA3 and SNH guidance ‘Assessing the Cumulative Impact of Onshore Wind Energy Developments’ (March 2012).

The LVIA will consider the potential effects of the addition of the Proposed Development to the existing landscape against a baseline that includes existing wind farms and those under construction. The CLVIA will consider the potential additional effects of the Proposed Development against a baseline that includes wind farms that may or may not be present in the landscape in the future i.e. including wind farms that are consented but unbuilt, undetermined planning applications (including those which may have been refused and are currently at appeal stage), and in some instances scoping stage schemes where it is deemed appropriate (and sufficient information is available in the public domain).

A review of the existing pattern(s) of wind energy development will be undertaken, considering operational, consented and proposed wind farms which are the subject of a valid application, up to a 60km radius from the site, in accordance with current NatureScot guidance.

The CLVIA will focus on those wind energy developments considered to have potential to give rise to significant cumulative effects in conjunction with the Proposed Development. This is likely to primarily be those wind farms located in the more immediate landscape context of the site, including the emerging cluster around Forss, on the coastline to the north-west. Turbines of less than 50m to blade tip and single turbines beyond 5km from the site will not be included in the detailed assessment. Figure 5.4 illustrates the locations of operational, consented and proposed wind farms within 40 km of the site.

5.5 Impact Prediction and Evaluation

5.5.1 Context

The LVIA will be produced to a standard suitable for submission within an EIA-R, in accordance with the EIA Regulations and GLVIA3. In addition, the assessment will take account of the following:

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017);

- SNH (2012) Assessing the cumulative impact of onshore wind energy developments;
- SNH (2018) A Handbook on Environmental Impact Assessment, Appendix 2: Landscape and Visual Impact Assessment, Version 5;
- SNH (2017) Visual Representation of Wind Farms, Version 2.2;
- THC (2016) Visualisation Standards for Wind Energy Developments;
- SNH (2020) Assessing impacts on Wild Land Areas - technical guidance;
- 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.

The LVIA will consider the landscape and visual effects on receptors identified in the agreed study area during construction, operation and de-commissioning stages.

The potential impacts of construction and operational aspects of the Proposed Development, including ancillary elements (e.g. site infrastructure and any off-site impacts associated with access or highways improvements related to the Proposed Development) will also be assessed.

The selection of receptors to include in the assessment will be based on the requirement for EIA to consider the likely significant effects. Effects that are not likely to be significant do not require assessment under the EIA Regulations.

5.6 Zones of Theoretical Visibility (ZTV)

In order to assist in evaluating the potential landscape and visual effects arising from the Proposed Development, blade tip and hub height ZTVs will be generated to identify the potential extent of the Proposed Development's visibility over the agreed study area. In order to assist initial consultations, a preliminary ZTV has been produced (Figure 5.1). This ZTV reflects the theoretical visibility of the optimised scheme (5 turbines at 138.5 m to blade tip height, noting this may be subject to change).

5.7 Receptors

Based on the findings of the 2020 LVIA (and feedback from THC and NatureScot on this application) and baseline studies to date, a range of landscape and visual receptors for assessment in the LVIA have been identified. The detailed scope of the LVIA for the revised application (optimised layout of 5 turbines at 138.5 m to tip height) will seek to refine the landscape and visual receptors considered in detail.

Landscape receptors assessed in detail will include the Dunnet Head Special Landscape Area (SLA). From the Farr Bay, Strathy and Portskerra SLA the ZTV (refer to Figure 5.1) indicates some theoretical visibility from eastern facing coastal edges and coastal hill flanks. This is beyond approximately 18km from the Proposed Development. Due to viewing distance and intervening operational wind farm context, the special qualities of this landscape are unlikely to be compromised.

Effects on NSAs and wider SLAs, all beyond 20 km from the Proposed Development, are unlikely to be significant, and are proposed to be scoped out.

With regard to Wild Land, the East Halladale Flows WLA (39), is located approximately 11km to the south-west of the Proposed Development. The ZTV (refer to Figure 5.1) highlights an intermittent and somewhat limited pattern of visibility, focused along the north-eastern edges and eastern parts of the WLA. There is operational wind farm development between this WLA and the site (Baillie Wind Farm), which has altered outward views to the north-east, from this WLA. This is noted in the description⁴ for the WLA, which states (page 4):

“In some places, these views also include human artefacts and contemporary land uses that are tall or elevated, and thus appear prominent in contrast to the horizontal emphasis of the peatlands. These elements are mainly located at or beyond the edge of the WLA and include high voltage power lines, wind farms, telecom masts, fences and conifer trees.”

No significant effects on the key attributes of East Halladale Flows WLA were identified in the 2020 LVIA. As such, and based on the smaller Proposed Development considered as part of this revised application, no significant effects on the key attributes of this WLA are considered likely.

Furthermore, effects on wider WLAs (Causeymire-Knockfin Flows WLA (36) and Hoy WLA (41), which are both located over 20km from the Proposed Development) are proposed to be scoped out, given their distance from the site.

Based on a review of the original application, feedback from THC and NatureScot and the ZTV for the Proposed Development, landscape character types (LCT) with the potential for significant effects on landscape character include (refer to Figure 5.3):

- Farmed Lowland Plain LCT (143);
- High Cliffs and Sheltered Bays LCT (141);
- Sweeping Moorland and Flows LCT (134);
- Sandy Beaches and Dunes LCT (140); and
- North Caithness and Pentland Firth Seascape Character Unit (Seascape Unit 8).

Visual receptors comprise those individuals or groups of people which will experience views of the Proposed Development. The main groups of potential visual receptors are as follows:

- residential receptors in the main settlements in the study area with potential views of the Proposed Development e.g. at and around Thurso and Dunnet;
- tourists or visitors, including users of outdoor recreational facilities including cycle routes such as National Cycleway 1 and the core path network in the more immediate context of the site;
- visitors to locations which have important physical, cultural or historic attributes including Dunnet Bay Seadrift Centre;
- visitors to beauty spots or picnic areas and formal/mapped vantage points;
- hill walkers, which includes those walking on unmarked footpaths;

⁴ <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20East-Halladale-Flows-July-2016-39.pdf>

- passengers on boats such as the Stromness Vehicle Ferry; and
- road users including receptors in the A9 and A836 (which forms part of the North Coast 500).

The ZTV (refer to Figure 5.1) represents a worst-case scenario as it does not reflect screening which will result from intervening vegetation or built structures. Moreover, the viewshed for the optimised scheme (which is subject to change) may be reduced as the design is finalised, with corresponding reductions in the number of potential receptors.

Table 5-1 below outlines the proposed viewpoint list. This is based on the viewpoints considered in the 2020 LVIA, and based on the findings of the preliminary ZTV and the above groups of receptors. Further refinement of locations on site is likely as part of detailed field work. RES welcomes further comments from stakeholders with regard to these viewpoints as part of the consultation process.

Table 5-1 Preliminary Viewpoints

Vpt No.	Location	Co-ordinates	Distance /Direction to Proposed Wind Farm	Receptors
1	A836 by Motocross Track	307130, 969539	>1 km South-west	Represent views for road users (and tourists) from the major route, which forms part of the North Coast 500 (NC500).
2	NCR1/Thurso to Reay Road	306666, 964697	3.1 km North	Represents views for recreational users of the cycle track (and road users) which forms part of NCR1.
3	A836, Thurso	310890, 968823	3.9 km South-west	Represent views for road users (and tourists) from this major route, which forms part of the NC500.
4	St Mary's Chapel, Crosskirk	302495, 970131	4.0 km South-east	Represents recreational views for visitors to the Chapel.
5	Kintail Cottage	302056, 963965	5.3 km North-east	Represents views for recreational users of the cycle track (and road users) from NCR1 and nearby residential receptors. Visibility of optimised layout is reasonably limited, so this viewpoint will be kept under review.
6	A9 South of Thurso	312400, 965300	6.3 km North-west	Represent views for road users (and tourists) from this major route, which forms part of the NC500 and NCR1.
7	Northlink Ferry (Scrabster to Stromness)	312148, 973901	7.4 km South-west	Represents views for tourists and passengers on ferry, and recreational craft in the Pentland Firth.
8	A836 Reay	295746, 965900	10.2 km East	Represents views for tourists and recreational receptors of the coastal edge, north of Reay.
9	Beinn Ratha	295433, 961315	12.2 km North-east	Represents recreational views experienced by hill walkers.

10	Georgemas Junction Station Figures	315563, 959316	12.6km North-west	Represents views experienced by tourists and rail passengers.
11	Ben Dorrery	306298, 955073	12.6km North	Represents recreational views experienced by hill walkers.
12	Dunnet Bay Visitor Centre	321898, 970492	15 km West	Represents views for tourists and recreational receptors of the coastal edge.
13	Easter Head Light House car park	320531, 976501	15.7 km South-west	Represents views for tourists and recreational receptors of the coastal edge.
14	A9 north of Substation	316885, 952022	19.1 km North-west	Represents views for road users travelling north on the A9. The Proposed Development is screened from this viewpoint, and this viewpoint is proposed to be scoped out.
15	Loch Watten visitor car park	324719, 954931	22.4 km North-west	Represents views for tourists and recreational receptors.
16	Strathy Point	282904, 969548	23.1 km East	Represents views for tourists and visitors to nearby picnic site. Also, nearby residential receptors.

5.8 Visualisations

Wireframes and photomontages will be used to consider and illustrate changes to views. Photomontages will involve overlaying computer-generated perspectives of the Proposed Development over the photographs of the existing situation to illustrate how the views will change against the current baseline. Other (cumulative) wind farms visible from each of the viewpoints will be shown on the wireframes. Visualisations will be prepared in accordance with SNH (2017) visualisation guidance.⁵

Ancillary elements such as permanent anemometer masts and access tracks will be shown in photomontages for viewpoints within 5 km when they would be visible. Beyond 5 km it is considered unlikely that these ancillary elements would form more than a minor element of the entire Proposed Development when compared to the turbines.

The existing photography used to support the original application (captured in 2016) will be used in the preparation of photomontages. This photography will be verified through fieldwork, to confirm that there have been no notable changes in the view. Where there have been notable changes, photography will be re-taken.

5.9 Residential Visual Amenity

Given the nearest residential properties are located within 2 km of the site, a Residential Visual Amenity Assessment (RVAA) accompanying the LVIA will be carried out. This will be prepared in accordance with the Landscape Institute Residential Visual Amenity Assessment Technical Guidance Note 2/19 (2019). All

⁵ SNH (2017). Visual Representation of Wind Farms Guidance - Version 2.2

properties within 2 km of the proposed turbines will be considered. The detailed scope of the RVAA will be refined and focused upon those properties/ property groups for which THC raised concern in the decision notice (dated March 2019) to the original application. Properties which are new or under construction will be identified during field surveys, will also be considered .

6 Archaeology & Cultural Heritage

6.1 Introduction

The archaeology and cultural heritage assessment will be undertaken with reference to national, regional, and local planning policy, legislation and guidance, and will be conducted in accordance with the Chartered Institute for Archaeologists' 'Code of Conduct' (CIfA 2014, revised 2021) and 'Standard and Guidance for Historic Environment desk-based assessment' (CIfA 2014, updated 2022), the Principles of Cultural Heritage Impact Assessment in the UK (IEMA, 2021), and with the Highland Council Standards for Archaeological Work (The Highland Council, 2012).

6.2 Direct Effects

Direct effects on known (or on unknown and buried) archaeological remains relate to the possibility of disturbing, removing or destroying in situ remains and artefacts during ground works associated with the construction phase: e.g. excavations for turbine and building foundations, compounds, and access tracks.

Preliminary collation of baseline data, derived from studies carried out in 2014 and 2016, indicates that there are 56 heritage assets within the Proposal site. These assets include a possible prehistoric hut circle, two possible prehistoric burial cairns, and a burial cist identified by field surveys in 1980 (Mercer, 1981).

Other sites identified are more recent and represent farming settlement remains and sites associated with agricultural activity from the post-medieval period. These sites include former farmsteads, sheepfolds, quarries, and wells. The results of walkover field surveys, undertaken in 2014 and 2016 covering the whole of the present Proposal site, indicate that much of the northern part of the Proposal area is now improved pasture and that the land along the Hill of Forss ridgeline and hillslope is of semi / unimproved pasture and upland heather moorland.

Possible prehistoric assets previously recorded in the HER that lie within the 2014 and 2016 survey areas have become denuded through time as a result of land improvement, cattle trampling and farm vehicle movement; at least two (the possible prehistoric cairns) are now no longer visible, and only very faint traces of the possible hut circle were found. Other assets, such as the wells, have fallen out of use and are no longer visible; but the ruinous remains of three former farmsteads or buildings and two sheepfolds were found to still survive.

The Proposal will seek to avoid direct impacts upon known heritage assets through careful siting of infrastructure during the design process. However, depending upon other constraints there is a possibility that some assets could be subject to some level of direct impact. There is also a possibility that hitherto unknown archaeological remains survive below the current ground surface and there is a possibility that these could be affected during the construction phase of the Proposal.

6.3 Indirect Effects

Indirect effects include visual impacts upon the setting of heritage assets, including Listed Buildings, Scheduled Monuments, and Historic Gardens and Designed Landscapes. Depending upon the final turbine layout and configuration, there is the potential that a number of designated heritage assets in the vicinity of the wind farm could be subject to visual impact upon their settings. In particular, there are a number of

scheduled monuments within 5km of the Proposal which belong to monument types that are particularly sensitive to change within their settings. These assets include:

- Thing's Va and Scrabster Mains broch (SM 587 and SM 579), located to the east and north-east of the Proposal;
- a group of three prehistoric burial cairns and Knockglass broch (SM 469, SM 470, SM 471 and SM 562), located at Westfield to the south of the Proposal;
- chambered cairns at Cnoc Freiceadain and Hill of Shebster (SM 90078 and SM 476), to the south-west of the Proposal; and
- the scheduled remains of the medieval chapel of St. Mary (SM 90086) and the late 16th century tower house of Brims Castle (SM 5510), both located along the coast to the north-west of the Proposal.

The extent of visibility from these and other identified heritage assets will be assessed following receipt of the Zone of Theoretical Visibility (ZTV) data based on the final turbine layout. Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory Gardens and Designed Landscapes, and Inventory Battlefields at distances up to 10km from the outermost turbines, and which might be subject to impacts upon their settings will be identified and included in the assessment.

Subject to scoping responses from Historic Environment Scotland (HES) and the Highland Council's Historic Environment Team (THC-HET), other assets at greater distances may be included in the setting assessment.

6.4 Consultations

Following receipt of Scoping Opinions, further consultation will be carried out with HES and THC-HET to agree the scope of the assessment (including options for mitigation where relevant), confirm the assessment methodology to be adopted, and to discuss visualisation requirements and agree relevant viewpoints.

6.5 Baseline Assessments

6.5.1 Desk-based Assessment

An updated desk-based appraisal of the Proposal area will be undertaken, to identify all known cultural heritage features, designated or otherwise, within the Proposal area, and to inform the assessment of the archaeological potential of the land. The assessment will use the following sources:

- Highland Council's Historic Environment Record (HER);
- Historic Environment Scotland's on-line GIS database and Canmore;
- National Library of Scotland Map Library;
- Historic Environment Scotland's National Collection of Aerial Photography (NCAP) archives for oblique and vertical aerial photographs;
- Modern Aerial photography/satellite imagery (Google Earth, Bing Maps, ESRI World Imagery); and
- Historic Environment Scotland's Historic Land-use Assessment data for Scotland (HLAMAP).

6.6 Field Survey

Walk-over field surveys of the whole of the Proposal area have already been undertaken (in 2014 and in 2016), in connection with a previous application for a wind farm on this site. That survey work covered the whole of the now proposed development area, and no further field survey is required to inform the assessment for this application.

6.7 Assessment Methodology

6.7.1 Sensitivity

Cultural heritage assets are given weight through the designation process. Designation ensures that sites and places are recognised by law through the planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation and its laws and policies (HES, 2019).

Table 6-1 summarises the relative sensitivity of heritage assets (including their settings) relevant to the Proposed Development (excludes maritime records).

Table 6-1 Sensitivity of Heritage Assets

Sensitivity of Asset	Definition / Criteria
High	Assets valued at an international or national level, including: World Heritage Sites Scheduled Monuments Category A Listed Buildings Inventory Gardens and Designed Landscapes Inventory Historic Battlefields Non-designated assets that meet the relevant criteria for designation (including sites attributed as non-statutory register (NSR) sites where these are identified in Local Authority HER records)
Medium	Assets valued at a regional level, including: Archaeological sites and areas that have regional value (contributing to the aims of regional research frameworks) Archaeologically Sensitive Areas (ASA) (where these are identified in Local Authority records) ⁶ Non-Inventory Designed Landscapes (NIDL) (where these are identified in Local Authority records) Category B Listed Buildings Conservation Areas
Low	Assets valued at a local level, including: Archaeological sites that have local heritage value

⁶ There are no such designations in the Aberdeenshire study area.

Sensitivity of Asset	Definition / Criteria
	Category C listed buildings Unlisted historic buildings and townscapes with local (vernacular) characteristics
Negligible	Assets of little or no intrinsic heritage value, including: Artefact find-spots (where the artefacts are no longer in situ and where their provenance is uncertain) Poorly preserved examples of particular types of features (e.g. quarries and gravel pits, dilapidated sheepfolds, etc)

6.7.2 Magnitude of Change

The magnitude of impact (adverse or beneficial) will be assessed in the categories, high, medium, low and negligible and described in Table 6-2.

Table 6-2 Magnitude of Impact

Magnitude of Impact	Criteria	
	Adverse	Beneficial
High	Changes to the fabric or setting of a heritage asset resulting in the complete or near complete loss of the asset's cultural significance. Changes that substantially detract from how a heritage asset is understood, appreciated and experienced.	Preservation of a heritage asset in situ where it would otherwise be completely or almost completely lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated and experienced.
Medium	Changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is appreciably altered. Changes that appreciably detract from how a heritage asset is understood, appreciated and experienced.	Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated and experienced.
Low	Changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed.

Magnitude of Impact	Criteria	
	Adverse	Beneficial
	<p>significance such that this quality is slightly altered.</p> <p>Changes that slightly detract from how a heritage asset is understood, appreciated and experienced.</p>	<p>Changes that result in a slight improvement in the way a heritage asset is understood, appreciated and experienced.</p>
Negligible	<p>Changes to fabric or setting of a heritage asset that leave its cultural significance unchanged and do not affect how it is understood, appreciated and experienced.</p>	

6.8 Impact Prediction and Evaluation

The impacts of the Proposal on cultural heritage assets will be assessed as follows:

- identification and assessment of direct effects on heritage assets and proposals for mitigation of effects;
- assessment of potential for impacts on buried archaeological remains and proposals for mitigation of such effects;
- assessment of effects on the settings of heritage assets; and
- assessment of cumulative impacts on the settings of heritage assets in combination with other wind farm schemes (as identified by the LVIA consultants through consultation).

The results of the assessment will be presented in an EIA-R chapter together with appendices, which would include gazetteers of on-site constraints and of off-site receptors within 10km of the proposed wind turbines from which there would be theoretical visibility of the Proposal (based on the blade tip height ZTV). Study area distances will be agreed through consultation with HES and THC-HET. Depending upon the outcome of the analysis of the final ZTV, and following consultation with HES and THC-HET, visualisations (either wireframes or photomontages) will also be produced for key receptors to aid in assessment and representation of visual impacts.

7 Terrestrial Ecology & Ornithology

7.1 Introduction

Ornithological surveys were undertaken to establish the baseline ornithological conditions at the site (plus appropriate buffers). Fieldwork commenced in September 2012 and was completed in August 2017. Within this period, surveys were undertaken between September 2012 and August 2014 and October 2015 and August 2017. These provided data covering four breeding seasons (2013, 2014, 2016 and 2017) and four non-breeding seasons (2012/2013, 2013/2014, 2015/2016 and 2016/2017).

Ecological surveys were undertaken to establish the baseline ecological conditions at the site (plus appropriate buffers). Fieldwork commenced in July 2014 and was completed in March 2019.

Throughout the 2020 application, consultation was undertaken with NatureScot (formerly Scottish Natural Heritage, SNH), the Royal Society for the Protection of Birds (RSPB), the Highland Raptor Study Group (HRSRG) and the Scottish Environmental Protection Agency (SEPA) to ensure that the ecological and ornithological survey programme was sufficiently comprehensive to allow production of a robust Ornithological Impact Assessment (OIA) and Ecological Impact Assessment (EclA).

The EclA and OIA will be undertaken to identify whether there are likely to be any direct or indirect impacts on ecological or ornithological features as a result of the proposed development. The assessments will consider the likely significant effects on ecology and ornithology associated with the construction, operation and decommissioning of the proposed development. The specific objectives of the assessments will be to:

- Describe the ecology and ornithology baselines;
- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the potential effects, including direct, indirect and cumulative effects;
- Describe the mitigation measures proposed to address likely significant effects; and
- Assess the residual effects remaining following the implementation of mitigation.

Further details of previous and ongoing consultation, desk study and survey methods are provided below, along with a brief summary of the results of the completed baseline surveys. In addition, an outline of the EclA and OIA methodology is presented at the end of this section.

7.2 Consultation

Details of the consultation undertaken as part of the previous submission is provided in Table 5.1: Chapter 5 Non-Avian Ecology and Table 6.1: Chapter 6 Ornithology of the Cairnmore Hill Wind Farm Environmental Statement (ES) (October 2020).

NatureScot (formerly SNH), RSPB and SEPA will be consulted as part of the formal scoping opinion and if required, additional specific consultation will be undertaken. A summary of all consultation undertaken will be provided within the EclA and OIA.

7.3 Desk Study

The following data sources were considered as part of the previous assessment and will be reviewed/updated as required:

- NatureScot Sitelink (<https://sitelink.nature.scot/home>) for designated site information;
- National Biodiversity Network (NBN) Atlas website⁷ for historical species records;
- Deer Distribution Survey 2016 results⁸ by the British Deer Society;
- Ancient Woodland sites⁹ within 5km of the proposed development (Figure 7.1);
- Carbon and Peatland Map 2016¹⁰;
- HRSB and RSPB for historic raptor breeding data (the RSPB and the HRSB were previously contacted to request historical breeding raptor data in April 2019 and it is proposed to submit a second data request covering 2019 to 2021);
- Caithness Lochs SPA whooper swan, greylag goose and Greenland white-fronted goose wind farm development survey dataset (provided by NatureScot, a current version will be requested) for cumulative assessment;
- Pink-footed goose and (Icelandic) greylag goose feeding distributions (Mitchell 2012¹¹);
- Cairnmore Hill Wind Farm Environmental Statement (May 2020); and
- Various EIA-Rs and monitoring documents for wind farm projects within Natural Heritage Zone (NHZ) 2 North Caithness & Orkney.

Information gathered from the desk-based study confirmed that there are no statutory conservation designations within the site but that the proposed development is within 5km of one Special Area of Conservation (SAC) and six Sites of Special Scientific Interest (SSSIs, one of which is associated with the SAC) with qualifying interests related to ecology (Table 7-1, Figure 7.1).

Table 7-1 - Designated Sites within 5km of the Site (Ecology)

Designated Site Name	Distance from the Site	Qualifying Features (Ecological)	Status
Newlands of Geise Mire SSSI	1.46km	Valley fen	August 2012: favourable maintained
Holborn Head SSSI	1.85km	Maritime cliff	September 2006: favourable maintained

⁷ <https://scotland.nbnatlas.org>

⁸ The British Deer Society. Deer Distribution Survey Results 2016. <https://www.bds.org.uk/index.php/research/deer-distribution-survey>

⁹ Scottish Government. 2015. Ancient Woodland Inventory (Scotland). <https://data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland>

¹⁰ SNH (2016). Carbon and Peatland 2016 map. http://map.environment.gov.scot/Soil_maps/?layer=10

¹¹ Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge.

Designated Site Name	Distance from the Site	Qualifying Features (Ecological)	Status
Westfield Bridge SSSI	1.96km	Fen meadow Lowland calcareous grassland	August 2003: favourable maintained June 2013: unfavourable declining
Loch Lieurary SSSI	2.07km	Basin fen	August 2008: favourable maintained
Ushat Head SSSI	2.15km	Maritime cliff	August 2006: favourable maintained
River Thurso SSSI	3.42km	Floodplain fen Vascular plant assemblage	May 2008: unfavourable no change July 2014: favourable maintained
River Thurso SAC	3.42km	Atlantic salmon	October 2011: unfavourable recovering

Information gathered from the desk-based study confirmed that there are no statutory conservation designations within the site but that the proposed development is within 20km of three SPAs (with their component Ramsar sites and SSSIs) and one SSSI with qualifying interests to ornithology (Figure 7.2):

- Caithness Lochs SPA (Table 7-2), underpinned by Caithness Lochs Ramsar site, Broubster Leans SSSI, Loch Calder SSSI, Loch Heilen SSSI, Loch Scarmclate SSSI and Loch Watten SSSI;
- North Caithness Cliffs SPA (Table 7-2), underpinned by Dunnet Head SSSI and Red Point Coast SSSI;
- Caithness and Sutherland Peatlands SPA (Table 7-2), underpinned by Caithness and Sutherland Peatlands Ramsar, East Halladale SSSI, Loch Caluim Flows SSSI, Strathmore Peatlands SSSI; and
- Lambsdale Leans SSSI (Table 7-2).

Table 7-2 - Designated Sites within 20km of the Site (Ornithology)

Designated Site Name	Distance from the Site	Qualifying Features (Ornithological)	Status
Caithness Lochs SPA, Ramsar and associated SSSIs	5.5km	Greenland white-fronted goose (non-breeding)	April 2016: favourable declining
		Greylag goose (non-breeding)	November 2015: favourable maintained
		Whooper swan (non-breeding)	March 2015: favourable maintained
		Breeding bird assemblage	June 2007: favourable maintained
	2.2km	Fulmar (breeding)	June 2016: favourable maintained

Designated Site Name	Distance from the Site	Qualifying Features (Ornithological)	Status
North Caithness Cliffs SPA and associated SSSIs		Gulliemot (breeding)	June 2016: favourable maintained
		Kittiwake (breeding)	June 2016: unfavourable declining
		Peregrine falcon (breeding)	June 2014: unfavourable declining
		Puffin (breeding)	June 2016: favourable maintained
		Razorbill (breeding)	June 2016: favourable recovered
		Seabird colony (breeding)	June 2016: favourable maintained
Caithness and Sutherland Peatlands SPA, Ramsar and associated SSSIs	9.1km	Black-throated diver (breeding)	June 2018: favourable maintained
		Common scoter (breeding)	June 2013: unfavourable declining
		Dunlin (breeding)	June 2015: favourable maintained/recovered
		Golden eagle (breeding)	August 2016: favourable maintained
		Golden plover (breeding)	June 2015: favourable maintained/recovered
		Greenshank (breeding)	June 2015: favourable maintained/recovered
		Greylag goose (breeding)	June 2018: favourable maintained
		Hen harrier (breeding)	June 2016: favourable maintained
		Merlin (breeding)	June 2004: favourable maintained
		Red-throated diver (breeding)	July 2006: favourable maintained
		Short-eared owl (breeding)	Condition not assessed
		Wigeon (breeding)	June 2018: favourable maintained
		Wood sandpiper (breeding)	June 2004: favourable maintained
		Breeding bird assemblage	June 2015: favourable maintained
Lambsdale Leans SSSI	12.4km	Breeding bird assemblage	June 2005: favourable recovered

7.4 Baseline Surveys

Ecology

The list below details the surveys¹² undertaken at the site with the paragraphs below providing a brief overview of the results. It should be noted that the survey extents covered a wider area than the proposed development now encompasses (survey areas are detailed on Figure 7.3).

- National Vegetation Classification (NVC) surveys: 3rd and 4th July 2014 (undertaken by Caledonian Conservation), 27th to 29th August 2019, and 5th and 6th March 2019.
- Protected species surveys: 3rd and 4th July 2014 (undertaken by Caledonian Conservation), 28th and 29th August 2018, and 6th March 2019.
- Bat surveys (all undertaken by Caledonian Conservation):
 - Walkover survey: May 2014.
 - Bat habitat assessment survey: May 2014.
 - Building roost survey: May 2014.
 - Bat activity line transects: 21st May, 14th July and 24th September 2014.
 - Remote static bat survey: 18th to 23rd May, 10th to 15th July, and 15th to 23rd September 2016.
 - Preliminary bat roost assessment: 6th March 2019.

Field surveys were conducted following the relevant recommended guidance available at the time of surveys.

No further ecology surveys are proposed to be undertaken at the site:

- Habitats/NVC surveys: there have been no changes to land management at the site and consequently the habitat data gathered is still considered to be representative of the habitats present on the site.
- Protected species surveys: whilst the last protected species surveys were undertaken over 18 months ago (March 2019), considering the limited suitability of the site for protected species and that surveys in 2014, 2018 and 2019 consistently recorded no evidence of protected species, the current baseline data is considered representative to provide for a robust assessment to be undertaken. Furthermore, pre-construction surveys for protected species will continue to be committed to as part of the assessment.
- Bats: with the exception of updated bat roost surveys in 2019, bat surveys were undertaken in 2014 and 2016, however given the overall low activity levels recorded and the limited suitability of the site, the current baseline data is considered representative to provide for a robust assessment to be undertaken.

The NVC survey indicated that the site is roughly divided between heathland (predominately wet heath) on the higher ground and grassland in and around the enclosed fields at the north of the survey area. The heathland present within the survey area corresponds with habitats listed on Annex I of the Habitats

¹² Unless specified otherwise, surveys were undertaken by MacArthur Green.

Directive. Highly groundwater-dependent terrestrial ecosystems were not found within the survey area, although wet heath is considered to be moderately groundwater-dependant (SEPA 2012). Very small areas of habitat within the survey area also correspond with Annex I listed swamp and blanket bog communities.

No signs of otter, badger, water vole, pine marten or red squirrel were found across the surveys in 2014, 2018 or 2019. There was also considered to be limited to no habitat likely to support these species within the survey area. Fish habitat surveys indicated that none of the watercourses within the survey were suitable for containing fish and whilst there were a number of small ponds identified on the Ordnance Survey (OS) maps in advance of the surveys, no amphibians were recorded. Considering the site is located outwith the known range of great crested newt¹³, specific surveys for great crested newt were not deemed necessary.

Bat activity on the site in 2014 was deemed to be very low with the habitats present on the site determined to be sub-optimal for bats. The 2014 bat data was reviewed in conjunction with the NVC and habitats data collected by MacArthur Green in 2018 and it was concluded that no significant habitat change had occurred at the site since the bat surveys were conducted in 2014. Accounting for the geographical location of the site, (which is outwith the range of high collision risk species such as *Nyctalus spp.*) it was determined that the likelihood of bat activity levels having significantly changed since 2014 was low to negligible. NatureScot was consulted (refer to Table 5.1: Chapter 5 Non-Avian Ecology of the Cairnmore Hill Wind Farm ES, May 2020) regarding the validity of using the 2014 data for the previous assessment, and it was confirmed to still be relevant for the site. This was further validated by additional bat data gathered in 2016 (by Caledonian Conservation) that again showed the site to have low bat activity levels of a limited number of species.

Two buildings within the bat survey area (Blackheath and Hopefield) were considered to be of moderate potential for supporting roosting bats. However, the proposed development infrastructure layout is beyond the appropriate bat roost disturbance buffers from Blackheath and Hopefield buildings (correspondence with NatureScot as part of the previous submission confirmed that Blackheath is unsuitable for breeding bats and so would only be suitable for small numbers of bats as non-breeding roosts, appropriate buffer distance is therefore 30m). A stone ruin which is adjacent to the bat roost assessment survey area was assessed as having negligible roost suitability.

Ornithology

The list below details the surveys undertaken at the site with the paragraphs below providing a brief overview of the results. It should be noted that the survey extents covered a wider area than the proposed development now encompasses. All surveys were undertaken by Caledonian Conservation.

- Flight activity surveys - September 2012 to February 2013, May 2013 to August 2014, October 2015 to August 2017;
- Scarce breeding bird surveys, within the site boundary plus a 2km buffer - spring/summer 2013, 2014 and 2016;

¹³ Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155.

- Breeding bird surveys, within the site boundary plus a 500m buffer - spring/summer 2013, 2014, 2016 and 2017;
- Winter walkover surveys, within the site boundary plus a 500m buffer - December 2012 to February 2013 and December 2015 to February 2016; and
- Foraging goose surveys, within the site boundary plus a 5km buffer - September 2013 to May 2014.

Field surveys were conducted following the relevant recommended NatureScot Guidance (2010¹⁴, 2013¹⁵, 2014¹⁶, 2017¹⁷) depending on survey date and survey areas are detailed on Figure 7.4.

No further ornithology surveys are proposed to be undertaken at the site. Fieldwork commenced in September 2012 and was completed in August 2017. Within this period, surveys were undertaken between September 2012 and August 2014 and October 2015 and August 2017. These provided data covering four breeding seasons (2013, 2014, 2016 and 2017) and four non-breeding seasons (2012/2013, 2013/2014, 2015/2016 and 2016/2017). Whilst four years have elapsed since the most recent surveys, given the extent of the baseline data (four years across a six-year period), the interannual consistency of species' distribution and abundance and the unchanged land management, the current baseline data is considered representative to provide for a robust assessment to be undertaken. It should be noted that additional data requests to cover the intervening years since the previous requests will be sent to the HRSG and RSPB.

Across the baseline survey period, ten Annex 1 and/or Schedule 1 species have been recorded: barn owl, barnacle goose, golden plover, Greenland white-fronted goose, greylag goose, hen harrier, merlin, peregrine falcon, short-eared owl and whooper swan.

In addition, eight Red or Amber listed Birds of Conservation Concern (BoCC, Eaton *et al.* 2015¹⁷) commonly considered as target species (SNH 2017¹⁷) have been recorded: arctic skua, brent goose, curlew, herring gull, lapwing, pink-footed goose, ringed plover and woodcock.

Surveys for scarce breeding birds did not record an evidence of breeding activity within the 2km survey area. Surveys for breeding waders identified evidence of breeding curlew (2-5 territories), lapwing (4-8 territories) and ringed plover (up to one territory) within the 500m survey area.

Surveys for foraging geese and swans within the 5km survey area recorded foraging barnacle goose, brent goose, Greenland white-fronted goose, greylag goose, pink-footed goose and whooper swan, however there was limited evidence of any of these species using the habitat within the site itself (not unexpected given the habitats present on the site itself).

Flight activity surveys have recorded fifteen target species, collectively accounting for 1,969 flightlines (Table 7-3), which may be included in any collision risk modelling depending on their location in relation to the final turbine layout and turbine dimensions selected. It is considered likely that collision effects for

¹⁴ SNH (2005, revised 2010). Survey methods for use in assessing the impacts of onshore windfarms on bird communities.

¹⁵ SNH (2013). Recommended bird survey methods to inform impact assessment of onshore windfarms.

¹⁶ SNH (2014, revised March 2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms.

¹⁷ Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. and Gregory R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708-746.

arctic skua, hen harrier, herring gull and merlin, peregrine falcon and ringed plover will be scoped out of the assessment as per the previous assessment (Chapter 6 Ornithology, Cairnmore Hill Wind Farm ES, May 2020).

Table 7-3 - Summary of Ornithology Surveys Completed

Species	Number of Flights Recorded	Total Bird Seconds Recorded
Arctic skua	5	375
Barn owl	2	60
Curlew	239	14,775
Golden plover	123	382,515
Greenland white-fronted goose	15	194,160
Greylag goose	370	1,711,800
Hen harrier	52	5,595
Herring gull	123	12,075
Lapwing	809	985,890
Merlin	4	165
Peregrine falcon	6	195
Pink-footed goose	181	1,829,430
Ringed plover	7	3,795
Short-eared owl	3	60
Whooper swan	30	22,905

7.5 Assessment Methodology

7.5.1 Ecology

The EIA-R will include an EclA as Chapter 7: (non-avian) Ecology. This will consider the potential direct, indirect and cumulative effects that the construction and operation of the proposed development could have on determined Important Ecological Features (IEFs). It will also consider the potential effects on statutory designated sites. The EclA will be supported by technical appendices covering; habitats (NVC), protected species and bats.

In addition, the habitats that fall under Groundwater Dependent Terrestrial Ecosystem (GWDTE) categories will be assessed for their potential groundwater dependency based on the vegetation, presence of peatland and associated depths, topography and hydrological setting. If present, potential effects to GWDTEs will be assessed and considered within the design, with mitigation measures proposed, where appropriate. Effects on GWDTE will be assessed as part of the hydrology assessment of the EIA-R.

7.5.1.1 Method for Assessing Important Ecological Features

Effects on habitats will be assessed in relation to the feature's extent, distribution and quality in relation to regional or national references. For protected species, its ecology, reference population, conservation status, range and distribution will be considered. The assessment of potential effects will follow CIEEM (2018¹⁸) guidelines and be undertaken in line with European and national legislation, policy and guidance.

The assessment of IEFs involves the following process:

- Identifying the potential effects of the proposed development;
- Considering the likelihood of occurrence of potential effects where appropriate;
- Defining the Nature Conservation Value (NCV) and conservation status of the ecological features present to determine a level of sensitivity;
- Establishing the magnitude of the effect (both spatial and temporal);
- Based on the above information, making a judgement as to whether or not the identified effect is significant with respect to the EIA Regulations;
- If a potential effect is determined to be significant, suggesting measures to mitigate or compensate the effect where required;
- Considering opportunities for enhancement where appropriate; and
- Determining the significance of residual effects after mitigation, compensation or enhancement.

NCV is defined on the basis of the geographic scale, and it is also necessary to consider each feature's conservation status, its distribution and its population trend based on available historic records, to give an overall level of sensitivity.

¹⁸ Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd edition. CIEEM, Winchester

The significance of potential effects is determined by integrating the assessments of sensitivity and magnitude in a reasoned way.

A set of pre-defined significance criteria will be used in assessing the potential effects of the proposed Development. It is necessary to establish whether there will be any effects which will be sufficient to adversely affect the feature to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e. the 'do nothing' scenario). Furthermore, these predictions will be given with a level of confidence relative to the effect being assessed where required (in line with CIEEM 2018²⁰).

7.5.1.2 Cumulative Effects

An assessment of cumulative effects will be undertaken following published guidance (SNH 2012¹⁹). Cumulative effects on each IEF will be assessed in relation to other projects and activities subject to the EIA process within a relevant search area, and their effects on a relevant reference population; for example, at a watercourse, watershed or Natural Heritage Zone (NHZ) level.

7.5.2 Ornithology

The assessment method will follow the process set out in the relevant provisions of the EIA Regulations and guidance on implementation of the Birds and Habitats Directive (SERAD 2000²⁰ and SNH 2018c²¹).

7.5.2.1 Methodology for Assessing Ornithological Features

The EIA-R will include an OIA as Chapter 8: Ornithology. This will consider the potential direct, indirect and cumulative effects that the construction and operation of the proposed development could have on any identified Important Ornithological Features (IOFs) scoped in to the assessment. The OIA will be supported by a technical appendix that will include details of survey methodologies, all survey data and outputs from any collision modelling.

Effects on IOFs will be assessed in relation to the species' reference population, conservation status, range and distribution. The assessment of potential effects will follow guidelines published by CIEEM (2018²⁰) and SNH (2017¹⁷, 2018a²²).

The assessment involves the following process:

- Identifying the potential effects of the proposed development;
- Considering the likelihood of occurrence of potential effects where appropriate;
- Defining the Nature Conservation Importance (NCI) and conservation status of the bird populations present to determine overall sensitivity;

¹⁹ SNH (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments.

²⁰ SERAD (Scottish Executive Rural Affairs Department) 2000. Habitats and Birds Directives, Nature Conservation; Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds ('the Habitats and Birds Directives'). Revised Guidance Updating Scottish Office Circular No 6/1995.

²¹ SNH (2018c) Environmental Impact Assessment Handbook - Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

²² SNH (2018a) Assessing Significance of Impacts from Onshore Wind Farms Out-with Designated Areas.

- Establishing the magnitude of the likely effect (both spatial and temporal);
- Based on the above information, making a judgement as to whether or not the identified effect is significant with respect to the EIA Regulations;
- If a potential effect is determined to be significant, suggesting measures to mitigate or compensate the effect where required;
- Considering opportunities for enhancement where appropriate; and
- Reporting residual effects after mitigation, compensation or enhancement.

NCI is defined on the basis of the geographic scale, and it is necessary to consider alongside each IOF's conservation status, its distribution and its population trend based on available historic records, to provide an overall level of sensitivity.

The significance of potential effects is determined by integrating the sensitivity and magnitude in a reasoned way. Effects considered to be moderate or major will be Significant in the context of the EIA Regulations.

A set of pre-defined significance criteria will be used in assessing the potential effects of the proposed development. It is necessary to establish whether there will be any effects which will be sufficient to adversely affect the feature to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e. the 'do nothing' scenario). Furthermore, these predictions will be given with a level of confidence relative to the effect being assessed where required (in line with CIEEM 2018²⁰).

7.5.2.2 Methodology for Assessing Likely Significant Effects on an SPA

As detailed in Chapter 6 Ornithology of the Cairnmore Hill Wind Farm ES (May 2020) there was established to be potential for connectivity between the site and the Caithness Lochs SPA.

The method for assessing a likely significant effect on an SPA is different from that employed for wider-countryside ornithological interests (detailed above). The Habitats Directive is transposed into domestic legislation by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). Regulation 48 includes a number of steps to be taken by the competent authority before granting consent (these are referred to here as a Habitats Regulations Appraisal, HRA). In order of application, the first four are:

- Step 1: consider whether the proposal is directly connected to or necessary for the management of the SPA (Regulation 48(1)(b)).
- If not, Step 2: consider whether the proposal, alone or in combination, is likely to have a significant effect on the SPA (Regulation 48(1)(a)).
- If so, Step 3: make an Appropriate Assessment of the implications for the SPA in view of that SPA's conservation objectives (Regulation 48(1)(a)).
- Step 4: consider whether it can be ascertained that the proposal will not adversely affect the integrity of the SPA ("Integrity Test") having regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given (Regulation 48(5) and 48(6)).

It has already been established that the proposed development does not meet the criteria for Step 1.

The assessment on the integrity of the SPA in relation to the proposed development will be presented in the ornithology chapter of the EIA-R and the results of baseline surveys and scientific conclusions presented in the chapter will be used to inform the appraisal process, and potentially for the competent authority to conduct an Appropriate Assessment, if required.

7.5.2.3 Cumulative Effects

An assessment of cumulative effects will be undertaken following published guidance (SNH 2018b²³). Cumulative effects on each IOF relevant to this proposed development will be assessed in relation to other projects and activities subject to the EIA process within a relevant search area and their effects on a relevant reference population; for example, at an NHZ level for breeding species.

7.6 Potential Significant Effects

7.6.1 Ecology

The ways in which IEFs may be affected (directly or indirectly) by the construction and operation of the proposed development are:

- Direct and indirect habitat loss;
- Disturbance to/loss of breeding sites, resting places, roosts etc. for protected species;
- Direct/indirect loss of foraging resource for protected species;
- Displacement/disruption to movement of animals within/through the site;
- Direct effects upon protected fauna, i.e. road traffic accidents;
- Environmental effects, i.e. pollution of watercourses, etc.;
- Changes to habitat composition or quality through land-use change, increased human presence, etc.; and
- Cumulative effects relating to any of the above.

Based on the available information from the previous Cairnmore Hill Wind Farm ES (May 2020) and given the revised scheme is situated within the same study area, the following IEFs are likely to be scoped in to the EclA:

- Loss (both temporary during construction and permanent) of Annex I habitats (e.g., wet dwarf shrub heath).

7.6.2 Ornithology

The ways in which IOFs may be affected (directly or indirectly) by the construction and operation of the proposed development are:

- Direct habitat loss for birds through construction of the proposed development;

²³ SNH (2018b). Assessing the cumulative impacts of onshore wind farms on birds.

- Displacement of birds through indirect loss of habitat where birds avoid the proposed development and its surrounding area due to construction and decommissioning, turbine operation, maintenance and visitor disturbance. This also includes potential barriers to commuting or migrating birds due to the presence of the proposed development turbines and related infrastructure;
- Habitat modification due to change in land cover (e.g. forestry removal) or changes in hydrological regime, and consequent effects on bird populations;
- Death or injury of birds through collision with turbine blades, anemometer masts, or fences (if any) associated with the proposed development; and
- Cumulative effects relating to any of the above.

Based on the available information the previous Cairnmore Hill Wind Farm ES (May 2020) and given the revised scheme is situated within the same study area, the following IOFs are likely to be scoped in to the OIA:

- Caithness Lochs SPA;
- Greenland white-fronted goose;
- Greylag goose;
- Whooper swan;
- Curlew;
- Lapwing; and
- Golden plover.

7.7 Good Practice Measures

The following good practice measures/project assumptions were included in the Cairnmore Hill Wind Farm ES (May 2020) and will also be included in this submission.

- All electrical cabling between the turbines and the associated infrastructure would be underground in shallow trenches which would be reinstated during the construction period and where reasonably practicable, will follow the access tracks.
- Any disturbance areas around permanent infrastructure during construction would be temporary and areas reinstated or restored before the construction phase ends. The only excavation in these areas would be for cabling, as noted above, and otherwise would only be periodically used for side-casting of spoil until reinstatement.
- To ensure all reasonable precautions are taken to avoid adverse effects on habitats, protected species, ornithology and aquatic interests, a suitably qualified ECoW would be appointed prior to the commencement of construction to advise the Applicant and the Contractor on ecological and ornithological matters (with the assistance of a suitably qualified/licensed ornithologist if required). The ECoW would be required to be present on the site during the construction phase and would carry out monitoring of works and briefings with regards to any ecological/ornithological sensitivities on the site to the relevant staff working for the Contractor and subcontractors.

- A Species Protection Plan (SPP) will be implemented during the construction phase. The SPP will detail measures to safeguard protected species known to be in the area. Measures will include surveys in advance of construction activities and good practice methods during construction. Pre-construction surveys will be undertaken to check for any new protected species activity in the vicinity of the construction works.
- A Bird Protection Plan (BPP) will be implemented during construction and decommissioning of the proposed development. The BBPP will detail measures to ensure legal compliance and safeguard breeding and wintering birds known to be in the area. The BPP shall include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new breeding bird activity in the vicinity of the construction works.
- Implementation of appropriate pollution prevention measures (particularly in relation to watercourses) and standard good practice construction environmental management would occur across the site and form part of a Construction Environmental Management Plan (CEMP). An Outline CEMP will be included in the submission with the final version submitted as a condition of consent.
- Following changes in the Water Environment (Controlled Activities)(Scotland) Regulations 2011 (CAR) that came into effect on 1st September 2018, the applicant will seek a Construction Site Licence under Complex Car licence as regulated by SEPA.

7.8 Effects Scoped Out

7.8.1 Ecology

On the basis of policy, guidance and standards, common and widely distributed habitats or species (i.e. those of low conservation value) that are outwith the categories detailed below will be scoped out of the assessment, as it is unlikely that any potential significant effects on such features would occur due to the proposed development:

- Habitats on Annex I to the Habitats Directive or Scottish Biodiversity Priority Habitat list;
- Species on Annex II to the Habitats Directive; and
- Habitats or species protected by other legislation such as the Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 (as amended) or the Protection of Badgers Act 1992.

Furthermore, on the basis of the Cairnmore Hill Wind Farm ES (May 2020), pending a review of the final design for the proposed development, it is considered that the following will also be scoped out of the EclA:

- Designated sites and ancient woodland: based on the qualifying interests and distance from the site, all designated sites within 5km of the site will be scoped out of the assessment on the basis of lack of connectivity. Similarly, effects on ancient woodland will be scoped out due to lack of connectivity.

- Otter and water vole: no field signs were recorded and there is limited habitat present within the site with potential to support otter and water vole. The watercourses offer limited foraging opportunities for otter, and although they could be used as a link to other habitats, their potential was considered to be low. There was also low suitability for supporting water vole given the relatively low, rocky banks and limited suitable bank-side vegetation.
- Badger: no confirmed field signs were recorded and there is limited suitable habitat present within the site for supporting badger for foraging, commuting and sett-building, although there is the potential for them to use the more suitable habitats present around the site.
- Pine marten, wildcat, red squirrel and great crested newt: no field signs were recorded and there is limited suitable habitat present within the site for supporting pine marten, wildcat and red squirrel, given the general lack of woodland cover and open nature. There is also limited suitable habitat for amphibians, with the site being outwith the known range of great crested newt in Scotland.
- Bats: bat activity at the site was concluded to be low with the habitats at the site noted to be sub-optimal for foraging bats. There was also considered to be limited roosting habitat available (with the exception of Blackheath and Hopefield House) within the site and the surrounding area. Blackheath and Hopefield House were both identified to be of moderate suitability for roosting bats during surveys, however revisions to the previous design resulted in them lying outwith the bat roost disturbance buffers. Providing these locations continue to fall outwith the bat roost disturbance buffers for the proposed development they will be scoped out.

7.8.2 Ornithology

On the basis of baseline data, experience from other relevant projects and policy guidance or standards (e.g. SNH 2018a), the following species will be ‘scoped out’ since significant effects are unlikely:

- Common and/or low conservation species not recognised in statute as requiring special conservation measures (i.e. not listed as Annex 1/Schedule 1 species);
- Common and/or low conservation species not included in non-statutory lists (i.e. not listed as Amber or Red-listed BoCC species), showing birds whose populations are at some risk either generally or in parts of their range; and
- Passerine species, not generally considered to be at risk from wind farm developments (SNH 2016, 2017), unless being particularly rare or vulnerable at a national level.

Furthermore, on the basis of the Cairnmore Hill Wind Farm ES (May 2020), pending a review of the final design for the proposed development and updated collision modelling, it is considered that the following will also be scoped out of the EIA-R:

- Schedule 1/Annex 1 raptors and owls: all effects relating to barn owl, hen harrier, merlin, peregrine falcon, short-eared owl.
- Waders: all effects relating to woodcock.
- Other species: all effects relating to arctic skua and herring gull.
- Geese: all effects relating to barnacle goose and brent goose.

8 Hydrology, Hydrogeology & Geology

8.1 Introduction

This section considers the scope of potential effects on the geology, controlled waters (groundwater and surface water) and hydrologically connected receptors (including Groundwater Dependent Terrestrial Ecosystems, peatlands, private water supplies and designated sites) during the construction, operation and decommissioning phases of the Proposed Development. This assessment, and preparation of the EIA-R chapter, will be undertaken by an independent consultant. The following outlines the intended approach to be used within the assessment.

8.2 Methodology and Consultations

A desktop study and site visit will be undertaken to confirm the hydrological, hydrogeological, geological and peat characteristics of the site extent. Additionally, the desk-based assessment will consider potential hydrological connectivity to areas extending beyond the site boundary and assess hydrological receptors up to 5 km from the site boundary.

8.2.1 Legislation and Guidance

The following legislation and guidance has been considered;

- Water Framework Directive²⁴;
- The Highland Council (THC) Draft Onshore Wind Energy Supplementary Guidance, 2015²⁵;
- THC Addendum Supplementary Guidance: Part 2b, 2017²⁶,
- Scottish Planning Policy²⁷,
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations²⁸,
- The Public and Private Water Supplies (Miscellaneous Amendments)²⁹,
- Water Environment and Water Services (Scotland) Act 2003³⁰,
- Proposed electricity generation developments: peat landslide hazard best practice guide³¹,

²⁴ European Commission (2000) The Water Framework Directive (2000/60/EC). Available online at: https://ec.europa.eu/environment/water/water-framework/index_en.html [Accessed on: 16/12/2021].

²⁵ The Highland Council (THC) (2016) Onshore Wind Energy Supplementary Guidance. Available online at: <https://www.highland.gov.uk/onshorewind>. [Last accessed: 16/12/21].

²⁶ The Highland Council (THC) 2017, Addendum Supplementary Guidance: Part 2b. Available online at: <https://www.highland.gov.uk/onshorewind>. [Last accessed: 16/12/21].

²⁷ Scottish Government, (2020) Scottish Planning Policy. Scottish Government, Edinburgh.

²⁸ Scottish Government (2003) The Water Environment and Water Services (Scotland) Act 2003. Available at: <http://www.legislation.gov.uk/asp/2003/3/contents> [Last accessed 16/12/21].

²⁹ Scottish Government (2017) the Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2017. Available at: <http://www.legislation.gov.uk/ssi/2017/321/made>. [Last accessed 16/12/21].

³⁰ Scottish Government (2003) The Water Environment and Water Services (Scotland) Act 2003. Available at: <http://www.legislation.gov.uk/asp/2003/3/contents>. [Accessed last 16/12/21].

³¹ Energy Consents Unit and Scottish Government (2017), Proposed electricity generation developments: peat landslide hazard best practice guide. Edition 2.

- Scottish Natural Heritage (NatureScot) Peatland Survey. Guidance on Developments on Peatland³²,
- SEPA Developments on peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste³³,
- SEPA LUPS GU 31 Planning Guidance on Groundwater Abstractions and GWDTE V3, 2017³⁴,
- NetRegs Guidance for Pollution Prevention³⁵,
- WAT-SG-12: General Binding Rules for Surface Water Drainage Systems, SEPA, 2016³⁶,
- Control of water pollution from construction sites; Guidance for consultants and contractors (C532)³⁷.

Consultations

The following Consultees will be consulted in preparation of the EIA-R Chapter:

- Scottish Water,
- The Highland Council, Environmental Health,
- Nature Scot,
- Local Fisheries Board,
- Scottish Environmental Protection Agency.

Data sources

The following publicly available sources of information and guidance will also be consulted as part of the desk study assessment;

- The British Geological Survey (BGS) Onshore GeoIndex website³⁸,

³² Scottish Government, Scottish Natural Heritage, SEPA (2017), Peatland Survey. Guidance on Developments on Peatland, available online at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance-2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf>. [Last accessed 13/12/21].

³³ Scottish Environmental Protection Agency (SEPA) and Scottish Renewables, (2012) Developments on peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste. Version 1.

³⁴ SEPA (2017) Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. LUPS-GU31, Version 3.

³⁵ NetRegs (2021), Guidance for Pollution Prevention (GPPs) - Full list Available Online at: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/> Last Accessed: 17/12/21.

³⁶ SEPA (2016), WAT-SG-12: General Binding Rules for Surface Water Drainage Systems, Version 4.

³⁷ Williams et al., 2001. Control of water pollution from construction sites; Guidance for consultants and contractors (C532), CIRIA, London.

³⁸ British Geological Survey (BGS) (2021), Onshore GeoIndex. Available online at: www.bgs.ac.uk Last Accessed: 14/12/2021

- BGS Hydrogeological Map of Scotland³⁹,
- BGS Reay, Bedrock and Superficial Deposits Map⁴⁰,
- The Carbon and Peatland Map⁴¹,
- Ground and Surface Water Classification⁴²,
- Scottish Salmon Rivers⁴³,
- Designated Sites and River Basin Districts⁴⁴,
- River Basin Management Plan⁴⁵,
- Drinking Water Protected Areas⁴⁶,
- SEPA River and Coastal Flood Risk⁴⁷,
- SEPA Potentially Vulnerable Areas⁴⁸,
- Reservoir Inundation⁴⁹,
- Met Office Climate Averages at Strathy East⁵⁰,
- Peat probing reports to be provided by RES from the previous EIA-R submission (2020);
- National Vegetation Classification (NVC) surveys: 3rd and 4th July 2014 (undertaken by Caledonian Conservation), 27th to 29th August 2019, and 5th and 6th March 2019;
- Any other published information on existing ground conditions in the vicinity of the site.

³⁹ BGS (1988), Hydrological Map of Scotland, 1:625 000 Scale Geology Series, Edinburgh.

⁴⁰ BGS (2003), Reay, Scotland Sheet 115E, Bedrock and Superficial Deposits, 1:50,000 Geology Series. Keyworth, Nottingham.

⁴¹ Scottish Government (2021), Carbon and Peatland Map 2016. Available online at: <https://map.environment.gov.scot/sewebmap/>. [Last Accessed 13/12/21]

⁴² SEPA Water Classification Hub (2021), Available online at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> [last accessed on 14/12/21].

⁴³ Marine Scotland (2021), Salmon and Sea Trout- Scottish Salmon Rivers. Available online at: <https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=843>. Last accessed: 16/12/2021/

⁴⁴ Scotland's Environment (2021), Scotland's Environment Map. Available online at: <https://map.environment.gov.scot/sewebmap/>. [Last accessed 16/12/21]

⁴⁵ SEPA (2021), Water Environment Hub. Available online at: <https://www.sepa.org.uk/data-visualisation/water-environment-hub>. [Last accessed 16/12/21].

⁴⁶ Scottish Government (2014), Drinking Water Protected Areas. Available online at: <https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/>. [Last accessed on 16/12/21].

⁴⁷ SEPA (2021), Indicative River and Coastal Flood Map (Scotland). 1:200. Available online at: <https://map.sepa.org.uk/floodmap/map.htm>; [Last accessed 13/12/21].

⁴⁸ SEPA, (n.d), Highland and Argyll Local Plan District Thurso (Potentially Vulnerable Area 01/01. Available online at: https://www2.sepa.org.uk/frmstrategies/pdf/pva/PVA_01_01_Full.pdf. [Last Accessed 13/12/21].

⁴⁹ SEPA, (2015) Reservoirs Inundation Map. Available online at: <https://map.sepa.org.uk/reservoirsfloodmap/Map.htm>. [Last Accessed 13/12/21].

⁵⁰ Met Office (2021), Climate Averages, Strathy East. Available online at: <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gfmjjhy0r>. [Last Accessed 16/12/21].

8.3 Baseline Assessment

The detailed hydrological, hydrogeological, geological and peat characteristics will be defined along with an outline of likely and potential significant effects. An initial review of the baseline conditions at the Proposed Development is provided below.

8.3.1 Superficial Geology

The BGS 1:50:000 scale map sheet 115E (Reay) shows Glacial Till (Forse Member) is dominant across the site. Mapping also shows an area of variable thickness peat overlying a portion of the central part of the proposed development. Alluvium is mapped as present to the west of the site associated with Forss Water watercourse and its tributaries.

A review of the SNH Carbon Rich Soil and Deep Peat and Peatlands Habitat Map (2016) indicates there are no mapped areas of peat and organic soil within the site boundary of the Proposed Development.

8.3.2 Bedrock Geology

The Proposed Development and the surrounding area are underlain by the Devonian bedrocks comprising the Scrabster Flagstone Member which consists of interbedded siltstones and sandstone. The Scrabster Flagstone Member outcrops on parts of the site where the superficial cover is shallow or absent. Holborn Sandstone Member which also comprises interbedded sandstone and siltstone is present to the west of the site. There is a disused quarry in the southeast edge of the site extending beyond the site boundary.

BGS 1:50,000 scale map outlines a fault feature (inferred with displacement unknown) intersecting the southern boundary of the site (BGS, 2003).

8.3.3 Hydrogeology

The BGS Hydrogeological Map of Scotland 1:625,000, sheet 18 indicates that the bedrock beneath the site is classified as locally important aquifer (d1+2). However, it also indicates that in Caithness area, groundwater is confined to shallow zones of weathered rock with limited yields from boreholes. Several potential spring discharges are likely to be present across the site.

The aquifer is mapped on the GeoIndex Onshore 1:625,000 scale map as a moderately productive aquifer expected to locally yield small amounts of groundwater. Groundwater flow is likely to be in a west / north westerly direction.

8.3.4 Hydrology

A number of artificial and straightened surface water drains and ditches are present across the site and the surrounding areas. The site drains into several watercourses, this includes tributaries of Burnside Burn at the southeast of the site, the Burn of Brims approximately 800 m to the northwest, the Thusater Burn approximately 150 m to the northeast, Burn of Brimside approximately 270 m to the southwest, and Tordale Burn approximately 600 m to the south of the site.

The Burn of Brimside is likely to be discharging to coastal waters at Port of Brims, it may historically have been realigned to discharge to Forss Water by artificial drainage ditches. This will be assessed as part of the hydrology site walkover.

Parts of the south, west and east of the Proposed Development drain to Forss Water which flows in a north westerly direction approximately 750 m west of the site. The river discharges to the coast to the north of the site. The Forss Water (ID 20633) is classified overall as 'Good' condition (2019) under the Scotland River Basin Management Plans (RBMP).

Tordale Burn flows southeast likely discharging into Burn of Geise which eventually discharges into River Thurso approximately 3.42 km east of the site. The River Thurso discharges into Thurso Bay northeast of the site. River Thurso (ID: 20637) is classified overall as 'Good' condition (2018) under the RBMP.

Burnside Burn (ID 20626) is classified overall as 'Bad' condition (2019) but noted as having 'good ecological potential' under RBMP. The watercourse flows to the northeast of the site eventually discharging into the North Sea.

A waterbody is mapped on the Hill of Forss in the central part of the proposed development, review of aerial imagery indicates this waterbody may be dry and will be confirmed during a site walkover.

Lochan Bidhe is approximately 1.2 km northwest of the site, it is possible that the development will drain into this Loch.

Scrabster Loch is approximately 2 km to the northeast within the same river catchment.

8.3.5 Topography, Drainage and Climate

The site's topography is dominated by the Hill of Forss at an elevation of 138 m AOD in the central part. The ground level falls away from the hill to approximately 60 m AOD to the north and 120 m AOD to the south where Cairnmore Hillock influences elevation.

The artificial and straightened surface water ditches and drains across the site are likely to be primarily draining in a westerly direction towards Forss Water River as well as in a northerly direction through small tributaries discharging into the sea.

Long term climate averages from the Met office predict 984.55 mm of annual rainfall based on data collected from 1991 to 2020. This was based on Met Office data collated from the Strathy East Gauge which is located 20.5km east of the proposed development.

8.3.6 Ground Conditions, Peat and Wetland areas

The peat characteristics will be defined in the baseline EIA study, using information gathered during a desk study and site visit. An outline of potential impacts the Proposed Development may have in relation to peat during construction, operation and decommissioning phases will be provided, as well as guidance for the mitigation of the potential impacts.

Phase 1 peat probing was undertaken at the Proposed Development in 2016. Phase 2 peat probing will be undertaken to inform a Phase 2 Peat Landslide Hazard and Risk Assessments (PLHRA), which will be included in the EIA- R replacing the previously submitted Technical Appendix (TA) 2.4. The PLHRA will be undertaken following best practice guidance.

The Phase 2 peat probing survey will include other proposed infrastructure such as along proposed tracks (at 50 m intervals) and at 10 m crosshairs at turbine locations. The additional Phase 2 peat probing will ensure that all infrastructure locations have sufficient peat depth information to support relevant studies

on peat instability, peat excavation and reuse, and carbon calculations, and to inform micro-siting. It is unlikely that a more detailed peat probing and peat coring survey targeting areas of greatest potential impacts (e.g. infrastructure locations) will be required following design freeze.

A Peat Management Plan will be written in in general accordance with the guidelines set out by SEPA, where required.

Scottish Planning Policy states (Paragraph 205) that: *“Where peat and other carbon rich soils are present, applicants must assess the likely effects of development on carbon dioxide (CO2) emissions. Where peatland is drained or otherwise disturbed, there is liable to be a release of CO2 to the atmosphere. Developments must aim to minimise this release”.*

An updated and revised Carbon Calculator and Carbon Balance Assessment will be written to replace the previously submitted TA2.6 (2020) to account for any peat disturbance and consequential release of CO2.

Energy Consents Unit and Scottish Government guidance (2017) considers that Peat Landslide Hazard and Risk Assessment (PLHRA) should be a requirement where there is peat within the application boundary of a proposed development. A PLHRA will be updated and revised from the previously submitted Technical Appendix TA2.3.

The presence of GWDTE will be identified using Phase 1 National Vegetation Classification (NVC) data collected during the baseline assessments as part of the Ecology terrestrial habitats assessment and confirmed from the site walkover by a hydrogeologist. Where GWDTE are identified, recommendations would be made for monitoring of the most sensitive sites and which would follow the guidance set out by SEPA in its LUPS GU 31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems V3 (September 2017).

It is unknown if the quarry in the southeast corner of the site boundary has been backfilled. Historical information on the land uses for the proposed development and the immediate vicinity will be obtained from published records and any records held by The Highland Council. An assessment of the potential impacts of the Proposal on the current and historical land use will be undertaken particularly with respect to potential risk of the presence of or the potential of mobilising ground contamination from backfilled areas.

8.3.7 Private and Public Water Supplies

The Highland Council will be consulted on information on private water supplies (PWS) within a 5 km radius of the proposed development. The study will also aim to identify any other PWS associated infrastructures in the vicinity of the proposed development that may not be included in the records held by The Highland Council. The assessment of the potential impacts of the proposed development will be concentrated on those PWS which are assessed as being in connectivity to hydrological catchments.

The proposed development is located within an area designated as a Drinking Water Protected Areas (Groundwater) in the Scotland River Basin District (map 16). Drinking Water Protected Areas are bodies of water and their catchments which are used for the abstraction of water intended for human consumption.

Scottish Water will be consulted to determine if the proposed development is located within or close to any Scottish Water assets or within a drinking water catchment and to seek advice on appropriate protection measures.

As part of this assessment, a hydrogeologist will consider the effects of any piled foundations on the quantity and quality of both private water supplies and wider groundwater resources.

8.3.8 Protected Sites / Conservation Areas / Fisheries

The following designated sites have been identified within 5 km of the site boundary and are considered to possibly be hydrologically connected to the proposed development.

- SAC and SSSI: River Thurso located approximately 3.42 km east of the site boundary is designated as a SAC and SSSI for its biological features including Atlantic Salmon, flood plain fen and vascular plant assemblage.
- Newlands of Geise located approximately 1.46 km southeast of the development is designated a SSSI for its valley fen. There is potential for drainage from the proposed development to impact the SSSI.
- Several areas along the coast are designated as North Caithness Cliffs SPAs for breeding birds, the closest designated area is approximately 1.5 km north of the site boundary.
- Holborn Head located approximately 1.85 km northeast and Ushat Head located approximately 2.15 km northwest and Pennylands located approximately 3km northeast from the site boundary are designated as SSSI for their geological features.

The following designated sites located within 5 km of the proposed development were considered to be hydrologically disconnected or unlikely to be impacted by the proposed development.

- Caithness Lochs designated as SSSI and SPA for biological features including non-breeding birds and freshwater and upland habitat. The nearest of these designated Lochs is Loch Calder located approximately 5 km south which is located in a separate hydrological catchment to the proposed development.
- Westfield Bridge located approximately 1.96 km south of the proposed development which is designated SSSI for its biological features including fen meadow and grassland. The SSSI is located in a separate catchment to the proposed development.
- Loch Lieurary is located approximately 3.2 km south of the proposed development in a separate hydrological catchment and is designated for its basic fen wetland features.

Both River Thurso and Forss Water are identified as Scottish Salmon Rivers with Salmon considered present. Detailed information relating to the protected areas and fisheries designations will be used to assist in determining the importance of water bodies which will be included in the assessment. Fisheries will be consulted as part of the EIA- R.

8.3.9 Flooding

The Proposed Development is not within an area identified by SEPA to be at risk of significant flooding from both rivers and coastal waters. Eastern parts of the proposed development are mapped within a Potentially Vulnerable Area (PVA: 01/01) within the River Thurso Catchment.

The Proposed Development is also located within 1 km of flood risk zone for the Forss Water. Additionally, there are small, localised areas within the site boundary that are at medium to low risk of fluvial flooding

and high risk of surface water flooding, largely associated with depressions in the topography, as indicated by the Indicative River and Coastal Flood Map.

Reservoirs Inundation map indicates the Proposed Development is not at risk from an uncontrolled release of water under all possible dam failure scenarios.

A review of the potential fluvial risk on the proposed development will be carried out as part of the EIA. The Highland Council Flood Management Team will be consulted as part of any flood assessment undertaken.

8.4 Assessment of Effects

The following activities were identified as having potential to impact surface watercourses and downstream receptors including Designated Sites, DWPA's and PWS. Prior to the activities commencing the sensitivity of receptors and likely magnitude of impacts of the proposal development will be discussed with relevant consultees including SEPA and THC and appropriate mitigation will be implemented.

Consideration of any potential morphological effects on drains and surface watercourses as part of the proposed development will be assessed, as well as increases or changes to flow and drainage patterns from construction through to decommissioning. An assessment of potential risk of polluting watercourses associated with the proposed development will be assessed based on the proposed construction methods.

8.4.1 Construction Potential Effects:

- Indirect or direct chemical pollution from spillage of hazardous substances, oil, fuel and other hydrocarbons and concrete on watercourses and groundwater including downstream receptors (e.g. designated sites, GWDTE);
- Sediment and silt-laden runoff as a result of pollution from earthworks and stockpiling on watercourses and groundwater including downstream receptors (e.g. designated sites, GWDTE);
- Impediments and change to drainage patterns, pathways and flow regimes from construction features, temporary works, foundations and infrastructure on watercourses and groundwater flows;
- Short-term changes to supply quantity, quality, and continuity of private and public water supplies as a result of the proposed development; and
- Increased run-off and flood risk due to increase in hardstanding (permanent and temporary) for fluvial, river and surface waters on and downstream of the proposed development.

8.4.2 Operational Potential Effects:

- Impediments and change to drainage patterns and flows from linear construction features and foundations, on watercourses and groundwater flows;
- Increased run-off and flood risk due to increase in hardstanding (permanent) for fluvial, river and surface waters;

- Chemical pollution from spillage of hazardous substances used in operation and maintenance, and fuel and oils used in operation, permanent welfare facilities - on watercourses and groundwater; and
- Long-term changes to private and/or public water supplies - quality, quantity and continuity.

8.4.3 Decommissioning Potential Effects

- Effects would be similar to those during the construction phase however there is expected to be less earthworks than required during the construction phase.

8.5 Good Practice Measures and Mitigation

In order to reduce the significant effects identified above standard measures following best practice measures as outlined in the EIA-R Chapter and outline Construction Environmental Management Plan (CEMP) will be implemented.

An outline CEMP will be included as a technical appendix to the EIA-R which will include mitigation measures, environmental management requirements, outline method statements and environmental monitoring requirements to minimise effects.

The proposed development will operate under a Pollution Prevention Plan (PPP) following guidance listed in the NetRegs guidance resource.

Good surface water management will be followed as described in best practice guides including SEPA WAT-SG-12: General Binding Rules for Surface Water Drainage Systems (2016) and CIRIA Control of water pollution from construction sites: Guidance for consultants and contractors (CIRIA, 2001).

Ecological Clerk of Works (ECoW) will monitor compliance with the relevant documentation during the development. Ongoing monitoring by an ECoW during the construction phases will ensure preventative advice can be sought prior to works.

8.6 Effects Scoped Out

The following sensitive receptors are scoped out of further assessment at the scoping stage as they are assessed as being hydrologically disconnected from the proposed development.

Table 8.1: Hydrological Sensitive Receptors Scoped Out

Sensitive Receptor	Hydrologic connectivity to proposed development
Caithness Lochs SSSI and SPA	Hydrologically disconnected, separate catchment
Westfield bridge SSSI	Hydrologically disconnected, separate catchment
SSSI loch Lieurary	Hydrologically disconnected, separate catchment
Flood risk from reservoir inundation	No risk within catchment

The outcomes of the hydrological impact assessments will be used to influence and guide the infrastructure layout to be submitted as part of the planning application. Where any significant adverse effects cannot be mitigated through design iterations, these will be clearly identified within the EIA-R and a view offered regarding the overall effect on receptors.

9 Traffic and Transport

9.1 Introduction/Context including impacts

The traffic impact of the proposals will be assessed as part of the EIA-R. This will focus on the proposed delivery route which will see deliveries arrive at Port of Scrabster and be transported to site first via the A9 (T) and then the A836 at the 'Weigh Inn' junction. The delivery vehicles will then continue approximately 6km on the A836 to a new priority access junction to the site. This is a tried and tested route, with the Port of Scrabster having handled numerous Oil and Gas deliveries as well as several abnormal loads to the operational Baillie Hill and Strathy North wind farms. It is therefore envisaged that little to no physical works would be required between the Port of Scrabster and the site access junction on the A836.

9.2 Consultations

The same turbine dimensions are being considered for this proposed development as were used in the 2020 application. It is the intention that the extent of the study area, methodologies and data sources will be the same as used for the 2020 application.

9.3 Baseline Assessment

It is the intention of the applicant to use the same baseline assessment as agreed with THC and TS that was supplied with the 2020 application. With regard to abnormal load deliveries to the proposed site, a detailed review will be undertaken for the chosen route through to the proposed site access to include assessment of existing information, site visit, swept path analysis and gradient checks at constrained locations where existing information is not available. All horizontal, vertical and weight constraints will be noted for assessment.

Traffic flow and speed data on the A836 and on the A9 (T) will be obtained from the relevant authorities and supplemented with new automatic traffic count surveys if scoping discussions identify a necessity for additional data to be collected. Accident data will also be procured from THC and TS.

9.4 Assessment Methodology

The Traffic and Transport chapter of the EIA-R will cover the construction, operational and decommissioning phases of the project. The worst-case scenario for traffic impact occurs during construction; the operational and decommissioning phases usually generating far fewer trips than the construction phase. The impact assessment will be undertaken in line with the IEMA Guidelines for the Environmental Assessment of Road Traffic (1994) and will incorporate a high level sensitivity and statistical review of the construction phase impact. This will include the following:

- A summary of relevant policy;
- A summary of the methodology adopted for the assessment;
- A description of the existing and future baseline conditions;
- An estimate of trip generation during the construction, operational and decommissioning phases of the development;
- An assessment of the impacts that are likely to occur;

- Identification of appropriate mitigation measures;
- Identification of any residual impacts;
- Identification of any cumulative impacts from surrounding consented wind farms;
- Provision of a preliminary site access design; and
- Framework Traffic Management Plan.

9.4.1 Magnitude of Effect

IEMA guidelines identify changes in traffic in excess of 30%, 60% and 90% as being representative of “slight”, “moderate” and “substantial” impacts respectively. This approach will be adopted within the EIA-R Traffic and Transport chapter.

Magnitude	Impact
Substantial	Considerable deterioration/improvement in local conditions or circumstances (+90% increase in traffic)
Moderate	Readily apparent change in conditions or circumstances (60 - 90% increase in traffic)
Slight	Perceptible change in conditions or circumstances (30 - 60% increase in traffic)
Negligible	Very small change in conditions or circumstances (10 - 30% increase in traffic); and
No impact	No discernible change in traffic (- 10% increase in traffic)

9.4.2 Sensitive Receptors

Receptors are locations or land uses categorised by their qualitative degree of sensitivity (or Environmental Value)). The sensitivity of a receptor can be defined by the user groups who would be affected by change with vulnerable user groups such as school children and the elderly generally regarded as the most sensitive to change.

The EIA-R Traffic and Transport chapter will define sensitivity in accordance with the following criteria table.

Sensitivity	Receptor description
Very high	Nationally or internationally important site with special sensitivity to increases in road traffic.
High	Regionally important site with special sensitivity to increases in road traffic.

Medium	Residential (with frontage onto road under consideration), educational, healthcare, leisure, public open space or town centre/local centre land use
Low	Employment or out of town retail land use, such as retail park
Negligible	Very low importance and rarity, local scale

9.4.3 Impact prediction and Evaluation

9.4.3.1 Assessment of Significance

The assessment of significance in relation to the environmental impact of traffic should take cognisance of both the magnitude of effect and sensitive receptor criteria. The level of significance will be assessed in accordance with Table 2.4 of the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 2 (Part 5, HA 205/08).

		Magnitude of Impact (Degree of change)				
		No change	Negligible	Slight	Moderate	Substantial
Receptor Sensitivity	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral or Slight	Neutral or Slight

Dependent upon the sensitivity of the receptor, significance levels of “Moderate” and above are regarded as requiring further consideration.

9.4.4 Potential Effects

Should the statement of significance indicate that a link requires further consideration, they will then be assessed to determine the potential effects. The relevant potential effects in terms of traffic and transport as described in the IEMA Guidelines are listed below:

- Severance;
- Driver Delay;
- Pedestrian delay, intimidation, loss of amenity;

- Road accidents and safety; an0064
- Hazardous loads.

10 Noise

10.1 Introduction/Context including Impacts

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

Operational noise emitted by wind turbines can be associated with two types of noise source: aerodynamic sources due to the passage of air over the turbine blades; and mechanical sources associated with the gearbox, generator and other parts of the drive train.

The main focus of the acoustic impact assessment of operational noise will be the most relevant type of noise emission for modern wind turbines: aerodynamic noise, which is broadband in nature. Mechanical noise, which can be tonal in nature, is also considered albeit less relevant to modern wind turbines. Implicitly incorporated within this assessment is the normal character of the noise associated with wind turbines (commonly referred to as 'blade swish') and consideration of a range of noise frequencies, including low frequencies.

An assessment of the impact of construction noise, due to the operation of machinery and movement of traffic, will also be undertaken.

10.2 Consultations

The Highland Council's Environmental Health Department has been consulted regarding the proposed acoustic assessment methodology. This included discussion of the background noise survey locations in advance of the survey being undertaken and the attendance of an Environmental Health Officer during survey setup.

10.3 Baseline Assessment

Background noise measurements have been made at four properties geographically spread around the proposed wind farm site. Wind speed and direction were recorded concurrently on the proposed site to allow correlations with the noise data to be established. Rain data was also measured on-site using a rain gauge to allow any periods of rainfall to be excluded from the subsequent analysis.

10.4 Assessment Methodology

Within Scotland, noise is defined within the planning context by 'Planning Advice Note 1/2011: Planning and Noise'. Planning Advice Note 1/2011 refers to web-based planning advice for onshore wind turbines which states that the Department of Trade and Industry's 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97) should be used to assess and rate noise from wind energy developments. It is therefore considered that the use of ETSU-R-97 fulfils the requirements of Planning Advice Note 1/2011.

The guidance makes it clear that the noise restrictions placed on a wind farm must balance the environmental impacts of the development (particularly in relation to residential amenity) with the widely recognised and policy driven benefits that would arise through the development of renewable energy resources.

'A Good Practice Guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise', issued by the Institute of Acoustics in May 2013 and endorsed by the Scottish Executive, provides guidance on all aspects of the use of ETSU-R-97.

The operational noise assessment process can be outlined as follows:

- identify the nearest residential properties;
- identify the type and noise emission characteristics for the candidate wind turbine;
- calculate the noise levels predicted due to the operation of the proposed wind turbines at the properties being considered;
- determine the need for a background noise survey;
- agree the acoustic assessment methodology, and discuss background noise survey locations if required, with The Highland Council's Environmental Health Department;
- carry out baseline survey, if required;
- derive noise limits in accordance with relevant planning guidance;
- assess the predicted noise levels due to the operation of the proposed wind farm against the derived limits;
- assess the cumulative acoustic impact of the proposed wind farm in conjunction with neighboring schemes; and
- The web-based Technical Advice Note: Assessment of Noise, Appendix 1: Legislative Background, Technical Standards and Codes of Practice identifies BS 5228:2009 as being applicable to the assessment of construction noise. Predictions of construction noise levels will therefore be compared to significance criteria consistent with this standard.

10.5 Impact Prediction and Evaluation

An assessment will be carried out to determine the impact of construction and operational noise in accordance with appropriate guidance. The following guidance is relevant to the assessment of operational noise:

- PAN 1/2011, Planning and Noise;
- Onshore wind turbines, online renewables planning advice;
- ETSU-R-97, The Assessment and Rating of Noise from Wind Farms;
- Institute of Acoustics (2009), Acoustics Bulletin Article, Prediction and Assessment of Noise from Wind Farms; Bowdler et al, Vol. 34, No. 2; and Institute of Acoustics (2013), A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

With regard to construction noise, the following legislation and standards are relevant:

- The Control of Pollution Act 1974; and
- BS 5228:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites.

11 Safety and Other Issues

11.1 Introduction

It is proposed that a single EIA-R chapter will be prepared to draw together the assessments of the Proposed Development on other topics that are not dealt with within the other technical chapters of the EIA-R, or alternatively, to explain why these topics have been scoped out . It is anticipated that this chapter would include discussion of the following issues:

- Aviation;
- Communications and Telecommunications;
- Shadow Flicker;
- Population and Human Health (including dust); and
- Major Accidents and Disasters.

Predicted effects for these topics will be determined through a standard method of assessment based on professional judgement. Where a 'significant effect' is identified, this will be considered as significant in the context of the EIA regulations.

11.2 Aviation

In the wake of recent, Government-led consultation with the aviation organisations such as NATS, BAA, CAA, and the MOD, it is clear that large scale wind farm proposals can impact significantly on primary, secondary or weather radar stations and thus affect operational safety. Developers are encouraged to engage with these organisations and airport operators at an early stage in the design process, to establish the potential impacts and agree acceptable technical solutions. Where actual or potential conflicts exist, it is important that a solution is identified and that the relevant consultee agrees to that solution being realised within a suitable timescale.

Further consultation will be carried out with the CAA, NATS and the MOD as part of the EIA process. Consultation would lead to greater knowledge of existing links and transmitters and the requirement of mitigation measures to offset any disruption such as radar and obstacle effects for aircraft.

Information obtained from the consultees will be taken into account and, if necessary, the Applicant will begin discussions with the relevant operators over the likelihood and practicalities of radar mitigation. The conclusions of any discussions or agreements with relevant operators will be presented in the EIA-R. However given that HIAL, MoD and NATS did not object to the 2020 application, it is anticipated that minimal discussions will be required with these statutory consultees.

11.3 Communications & Telecommunications

Wind turbines can cause electromagnetic interference through physical and electrical interference. Physical interference can cut across electromagnetic signals resulting in a 'ghosting' effect which largely affects television signals and radar. Electrical interference arises as a result of the operation of the generator within the nacelle of the turbine and can also affect communication equipment in proximity to

the turbines. Where possible, any potential effects on radiocommunication links and television will be mitigated at the turbine layout design stage by the use of exclusion zones around any link paths.

The Office of Communications (Ofcom) is responsible for the licensing of two-way radio transmitters and holds a register of most microwave links. However, because not all microwave links are published, system operators will be individually consulted on the Proposed Development's potential to cause electromagnetic interference. The outcome of this consultation process, including any mitigation actions taken, will be detailed in the EIA-R.

11.4 Shadow Flicker

Shadow flicker is a phenomenon where, under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off. It only occurs inside buildings where the flicker appears through a narrow window opening.

A shadow flicker assessment is generally required if any properties lie within 10x rotor diameter of the wind farm. This is in line with Scottish Government online renewables planning advice on 'onshore wind turbines' which states that "where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), 'shadow flicker' should not be a problem."

Using proprietary specialist modelling software, Wind farm V4.1.2.2, an analysis of shadow flicker throughout the year from the proposed wind farm will be carried out, taking into account the trajectory of the sun, the local topography and the turbine layout and dimensions.

The modelling exercise for shadow flicker will confirm whether any property would be materially affected by shadow flicker. The results of a shadow flicker assessment of the final layout will be included as a technical appendix to the EIA-R and commented on as part of the project description section within the EIA-R.

12 Potential Grid Connection

12.1 Introduction

The specific configuration of the grid connection between the Proposed Development and the grid network is not yet finalised. It is hoped that all grid connection infrastructure, excluding the interconnector, will be within the Proposed Development's application. If this is the case, the potential grid connection options will be described in the EIA-R and consideration of the environmental effects of the indicative grid connection included within the EIA.

If the grid connection between the Proposed Development and the grid network is not within the Proposed Development's application containing overhead lines, the grid connection will be subject to a separate application under Section 37 of the Electricity Act 1989. If the grid connection is buried, the applicant would seek a generation licence and use associated permitted development rights.

If it is deemed at screening that an EIA is required for the grid connection, the EIA-R associated with the grid connection shall accompany that application. However, if sufficient detail is available from the Network Operator the EIA-R for the proposed development will include consideration of the environmental effects of an indicative grid route corridor.

13 Socio Economic

13.1 Introduction

Consideration of sustainable economic development has become a cornerstone of government policy and a key driver of the planning system in recent years. The underlying socio-economic wellbeing of an area is also itself a driver in terms of population change. The EIA will therefore include a socio-economic assessment to ensure the balance between economic, social and environmental effects can be properly assessed.

A report issued by BiGGAR Economics in 2016 concludes that there is no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm development.

The note of handling report for the 2020 application did not undertake a socio-economic assessment of the developments impact on number of jobs and the economic activity associated with the procurement, construction, operation and decommissioning of the development. The 2020 application, states on that *“project would deliver approximately £2.2 million in the form of jobs, employment, and the use of local services. The Applicant is committed to maximising the local economic impact from the proposed development and will work with stakeholders to ensure that local enterprises have an opportunity to bid for contracts”*.

The Report of Handling report went to state that *“without a detailed Economic Impact Assessment, it is not possible to assess the robustness of the investment figure, or, for example, the nature/locations of job creation. It is not possible, therefore, to reach a reasoned conclusion on the economic benefit of the development...While there are likely to be some detrimental short term economic impacts caused by construction activities, there is unlikely to be any significantly adverse impact from the development on local tourism and tourist oriented businesses based on the available evidence. As such, economic disbenefits are not considered a determining factor in the assessment of the proposal”*.

Due to this response, RES intends to scope out socio-economic impact from the EIA-R.

14 Climate Impact Assessment

14.1 Introduction

Climate change is a topic which can be impacted directly by a project and in turn also affect other topics (e.g. the impact of climate change can affect the future flood risk and such affects will be considered in the individual topic chapters).

Overall, the Proposed Development is anticipated to have a positive effect on climate change due to the carbon savings of renewable energy generation displacing the need for fossil fuel energy generation.

14.2 Legislation, Policy and Guidance

Schedule IV of the EIA Regulations which transpose the EIA Directive into Scottish law and states that:

- (4) A description of the factors specified in Article 3(1) likely to be significantly affected by the project, including climate (for example greenhouse gas emissions, impacts relevant to adaptation).
- (5) A description of the likely significant effects of the project on the environment resulting from, inter alia ...
- (f) The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.

14.3 Proposed Scope of Assessment

A Climate Impact Assessment (CIA) shall be prepared in accordance with Schedule IV Schedule IV of the EIA Regulations.

The CIA will consider relevant Scottish policy on climate change and adaptation and will also consider the climate change targets of the relevant local authorities.

The CIA approach will consider the likely magnitude of greenhouse gas (GHG) emissions of the Proposed Development in comparison to the baseline scenario with no development (where no emissions are produced as no construction takes place).

A carbon balance assessment will be carried out which assesses effects with reference to the magnitude of emissions released by the Proposed Development and the period of time it takes to payback for those carbon emissions, the context of those emissions (e.g. national, regional and local emissions reduction targets) and professional judgement.

This assessment will be based on the proposed information regarding the scale and nature of the Proposed Development. Where data is unavailable, worst-case reasonable assumptions will be used.

The carbon balance assessment consists of 4 steps;

- Step 1 -data gathering (e.g. infrastructure dimensions, peat probe data interrogation, habitat loss calculations);
- Step 2 -data input and review;
- Step 3 -completion of carbon balance tool and reporting; and
- Step 4 -review and QA

The carbon balance assessment will aim to quantify the emissions savings over the life of the Proposed Development against the release of CO₂ from other energy generation methods as a result of implementing the Proposed Development and will also report on carbon payback time.

This chapter will present the findings of the carbon balance assessment and will contextualise these results through describing the climate benefits which are likely to occur through delivery of the Proposed Development. In broad terms, these benefits include contribution to mitigating the effects of climate change; contribution to, and security of, domestic energy supplies and to a sustainable energy mix within Scotland and more broadly within the United Kingdom.

This chapter will also consider the possible effects of the Proposed Development on climate change, and the resilience of the project to the effects of climate change would be informed by other EIA-R chapters including Geology, Hydrology and Hydrogeology, and The Proposed Development (e.g. use of sustainable design measures).

15 Summary and Conclusions

15.1 Summary and Conclusion

This EIA Scoping Report outlines the proposed technical and environmental assessment that will be included within the EIA-R for the Proposed Development. 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 the Applicant would be happy to provide further information and/or discuss any further requirements.

In conclusion, this scoping report seeks the views of the relevant consultees on the proposed EIA and the content of the EIA-R for Cairnmore Wind Farm.

RES is experienced in wind farm development and seeks to work closely with consultees on this project to agree suitable solutions to site issues.

15.2 Responding to this scoping report

Consultee responses to this report should be directed to The Highland Council which will form a Scoping Opinion.

The Applicant will welcome such responses to inform the scope of EIA to be undertaken for the proposed development and further consultation to be undertaken with each consultee as the EIA progresses.

16 Appendix

16.1 Turbine Layout

Turbine	Easting	Northing
T1	305882	967652
T2	306060	968009
T3	306149	968401
T4	306676	968310
T5	306997	968574

16.2 Figure List

Figure 1.1 Site Boundary

Figure 1.2 Turbine Layout

Figure 5.1 Tip Height (138.5m) Zone of Theoretical Visibility (ZTV) and Viewpoint Locations

Figure 5.2 Landscape Character Types

Figure 5.3 Landscape Designations and Wild Lands Areas

Figure 5.4 Cumulative Base plan: Operational, Consented and Proposed Wind Farms within 40km

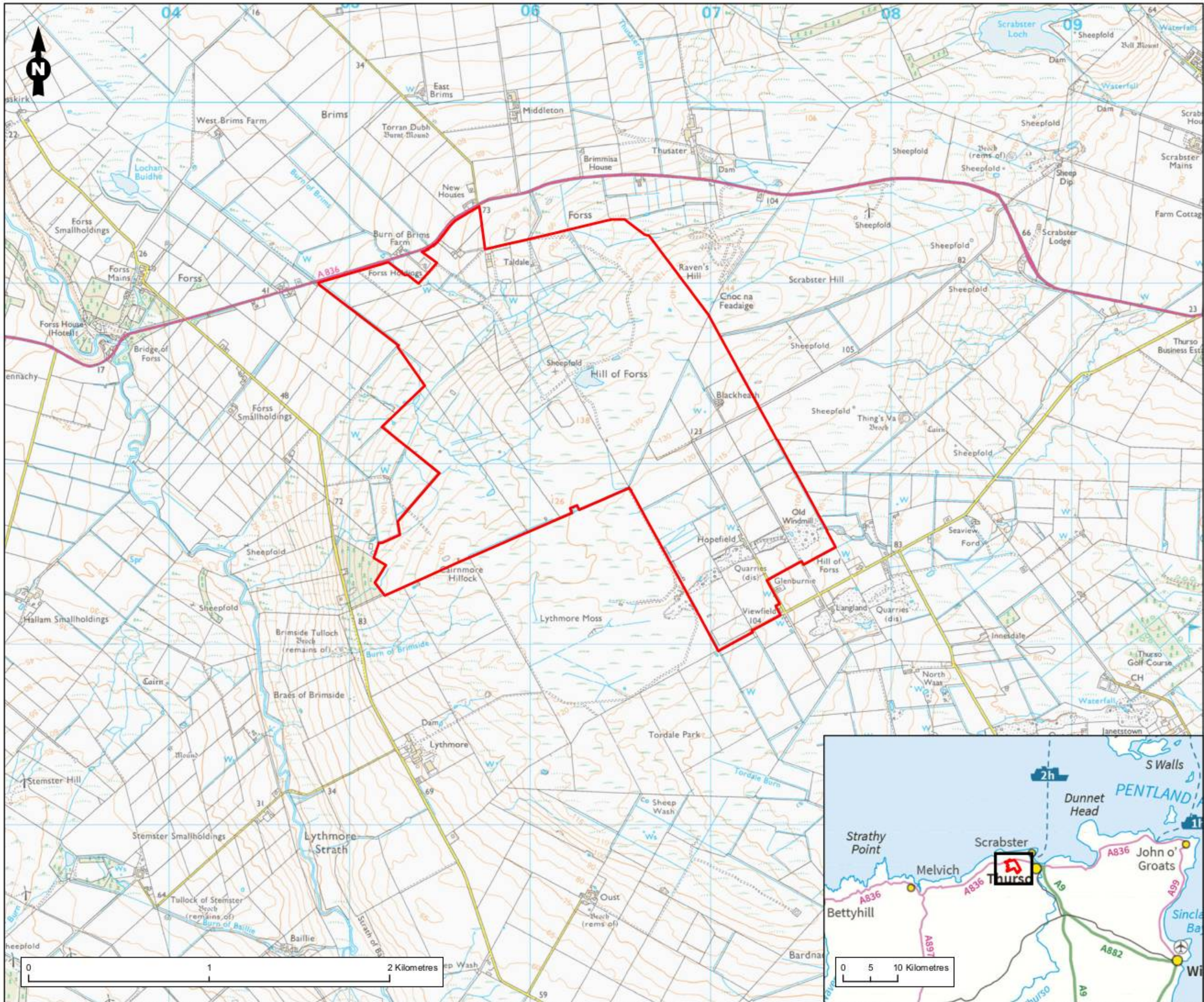
Figure 7.1 Ecological Designated Sites and Ancient Woodland within 5km

Figure 7.2 Ornithological Designated Sites within 20km

Figure 7.3 Ecological Survey Areas

Figure 7.4 Ornithology Survey Areas

Figure 8.1 Hydrology Study Area



Legend

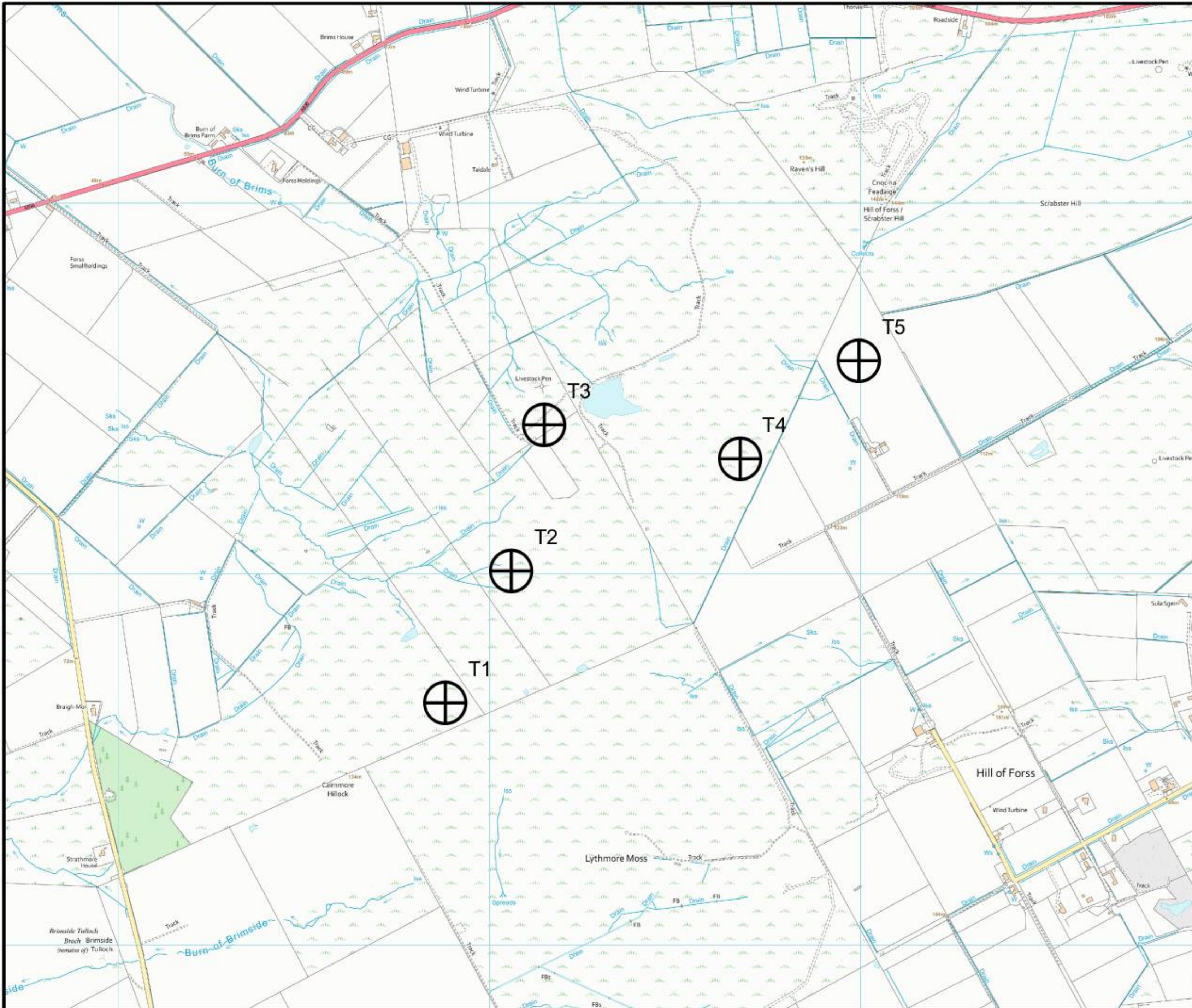
Site Boundary

Figure Title	
Figure 1.1: Site Location	
Project Name	
Cairnmore Hill Wind Farm	
Project Number	Figure No.
UK12-24968	1.1
Date	Prepared By
July 2020	AC
Scale	Issue
1:20,000 @A3	2
Client	
	



CAIRNMORE HILL

Figure 1.2 TURBINE LAYOUT



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 Turbines

Turbine	Easting	Northing
T1	305882	967652
T2	306060	968009
T3	306149	968401
T4	306676	968310
T5	306997	968574



LAYOUT DWG: N/A T-LAYOUT NO.: PS CO hof060

DRAWING NUMBER: **03022-RES-LAY-DR-TE-004**

SCALE - 1:10,000 @ A3

PLANNING APPLICATION 2022

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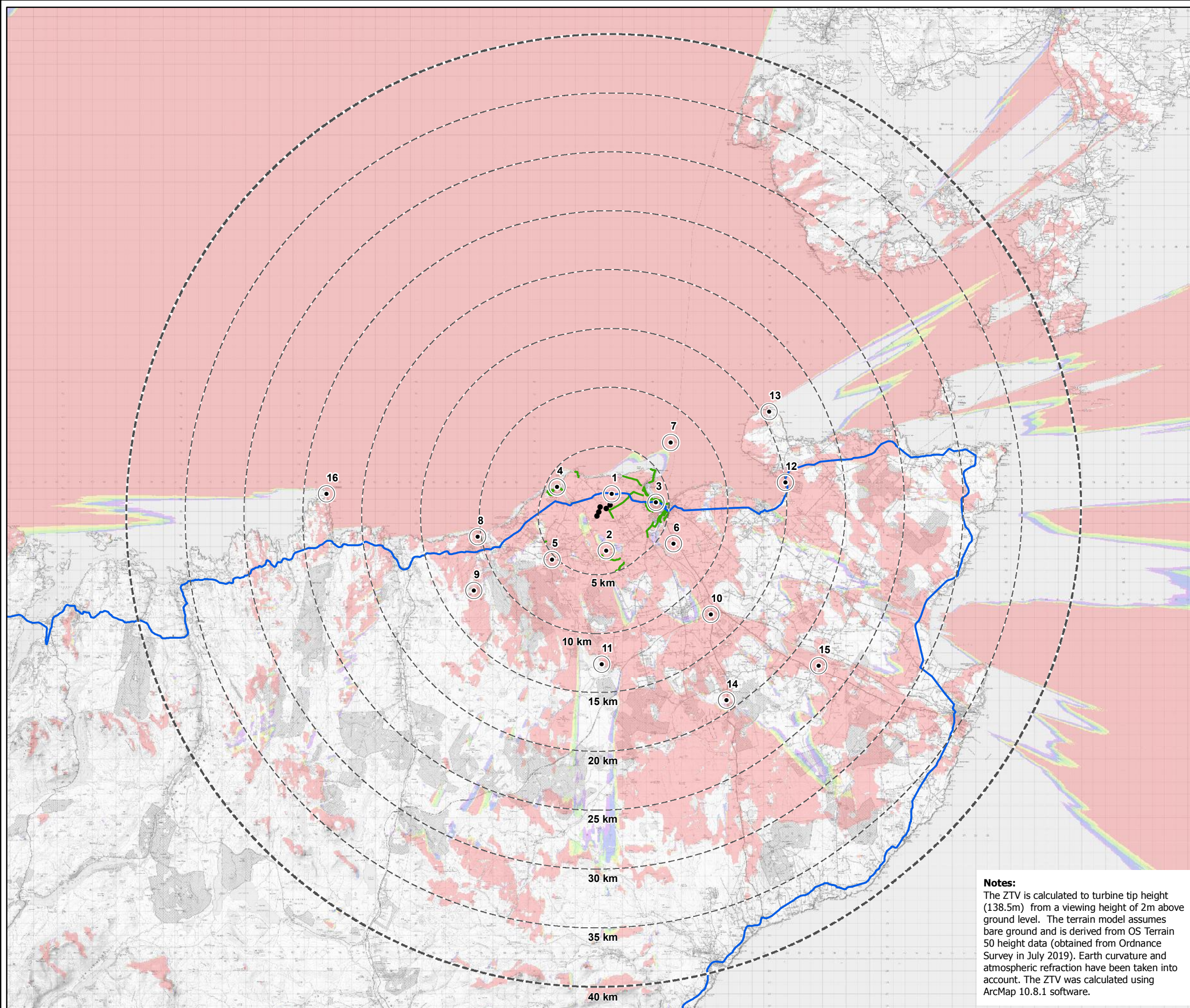


CAIRNMORE HILL WIND FARM

FIGURE 5.1

ZONE OF THEORETICAL VISIBILITY AND VIEWPOINT LOCATIONS

CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2021



- Turbine
 - 5km intervals from outer turbines
 - 40km LVIA study area
 - North Coast 500
 - Core Path within 5km of layout
- Theoretical wind farm visibility**
- 1 turbine visible
 - 2 turbines visible
 - 3 turbines visible
 - 4 turbines visible
 - 5 turbines visible

- Viewpoint
- 1: A836 by Motocross Track
 - 2: NCR1/Thurso to Reay Road
 - 3: A836, Thurso
 - 4: St Mary's Chapel, Crosskirk
 - 5: Kintail Cottage
 - 6: A9 South of Thurso
 - 7: Northlink Ferry (Scrabster to Stromness)
 - 8: A836 Reay
 - 9: Beinn Ratha
 - 10: Georgemas Junction Station Figures
 - 11: Ben Dorrery
 - 12: Dunnet Bay Visitor Centre
 - 13: Easter Head Light House car park;
 - 14: A9 north of Substation
 - 15: Loch Watten visitor car park
 - 16: Strathy Point



Notes:
 The ZTV is calculated to turbine tip height (138.5m) from a viewing height of 2m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 50 height data (obtained from Ordnance Survey in July 2019). Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.8.1 software.

Data source: RES, LUC, NatureScot, THC

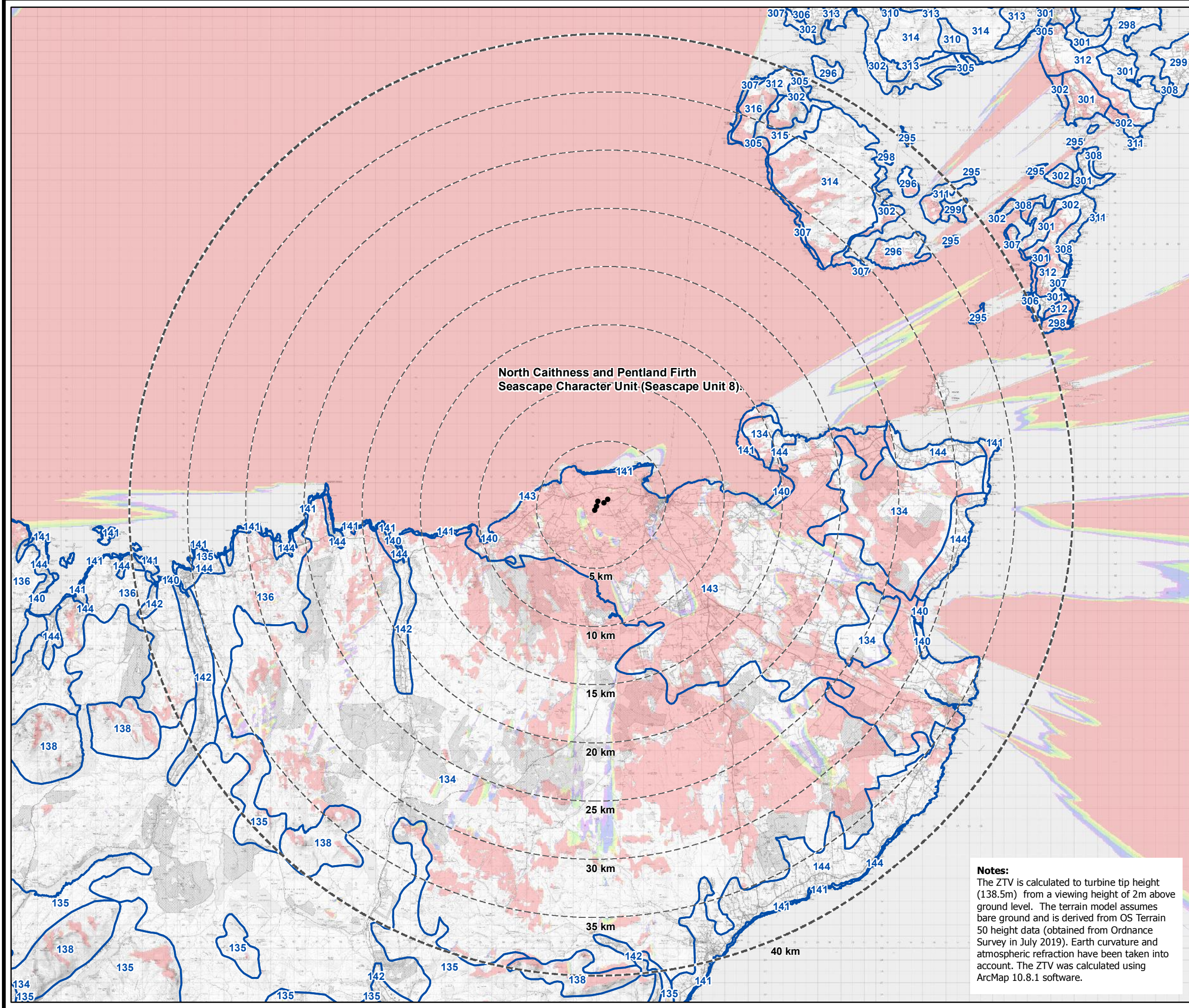
LAYOUT DWG XXXX	T-LAYOUT NO. PSCOf060
DRAWING NUMBER FIG5-1_11524_r0_ZTV_A3L	
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LVIA SCOPING REPORT 2021	
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CAIRNMORE HILL WIND FARM

FIGURE 5.2 LANDSCAPE CHARACTER TYPES

CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2021



- Turbine
 - 5km intervals from outer turbines
 - - - 140km LVIA study area
- Theoretical wind farm visibility**
- 1 turbine visible
 - 2 turbines visible
 - 3 turbines visible
 - 4 turbines visible
 - 5 turbines visible
 - Landscape Character Area

- 134. Sweeping Moorland and Flows
- 135. Rounded Hills - Caithness & Sutherland
- 136. Rocky Hills and Moorland
- 138. Lone Mountains
- 140. Sandy Beaches and Dunes
- 141. High Cliffs and Sheltered Bays
- 142. Strath - Caithness & Sutherland
- 143. Farmed Lowland Plain
- 144. Coastal Crofts & Small Farms
- 295. Holms
- 296. Whaleback Islands
- 298. Low Island Pastures
- 299. Undulating Island Pasture
- 301. Coastal Basin
- 302. Inclined Coastal Pasture
- 303. Rocky Coastal Pasture
- 305. Enclosed Bays
- 306. Coastal Hills and Heath
- 307. Cliffs - Orkney
- 308. Coast with Sand - Orkney
- 310. Loch Basin - Orkney
- 311. Low Moorland
- 312. Plateau Heath and Pasture
- 313. Rolling Hill Fringe
- 314. Moorland Hills - Orkney
- 315. U-Shaped Valley
- 316. Rugged Hills



Notes:
The ZTV is calculated to turbine tip height (138.5m) from a viewing height of 2m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 50 height data (obtained from Ordnance Survey in July 2019). Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.8.1 software.

Data source: RES, LUC, NatureScot
LAYOUT DWG: XXXX T-LAYOUT NO: PSCOf060

DRAWING NUMBER: FIG5-2_11524_r0_LCTs_A3L

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LVIA SCOPING REPORT 2021

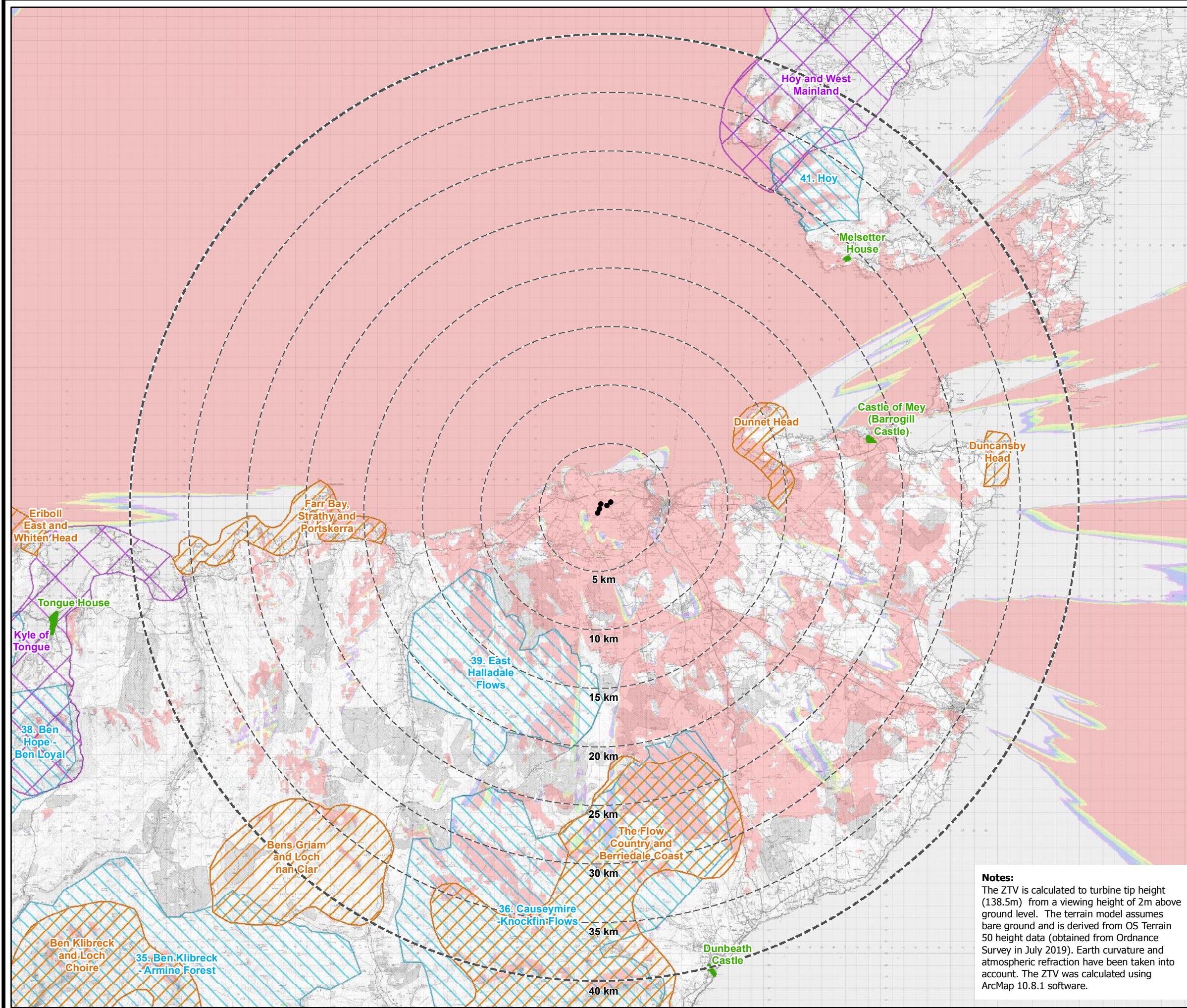
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CAIRNMORE HILL WIND FARM

FIGURE 5.3

LANDSCAPE DESIGNATIONS AND WILD LAND AREAS

CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2021



- Turbine
 - - - 5km intervals from outer turbines
 - - - 40km LVIA study area
 - ▨ Special Landscape Area (THC)
 - Garden and Designed Landscape
 - ▨ Wild Land Area 2014
 - ▨ National Scenic Area
- Theoretical wind farm visibility**
- 1 turbine visible
 - 2 turbines visible
 - 3 turbines visible
 - 4 turbines visible
 - 5 turbines visible

Notes:
 The ZTV is calculated to turbine tip height (138.5m) from a viewing height of 2m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 50 height data (obtained from Ordnance Survey in July 2019). Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.8.1 software.



Data source: RES, LUC, NatureScot, ScotGov, Highland Council

LAYOUT DWG: XXXX T-LAYOUT NO: PSC0hof060

DRAWING NUMBER: FIG5-3_11524_r0_LandscapeDesignations_A3L

SCALE - 1:320,000 @ A3

LVIA SCOPING REPORT 2021

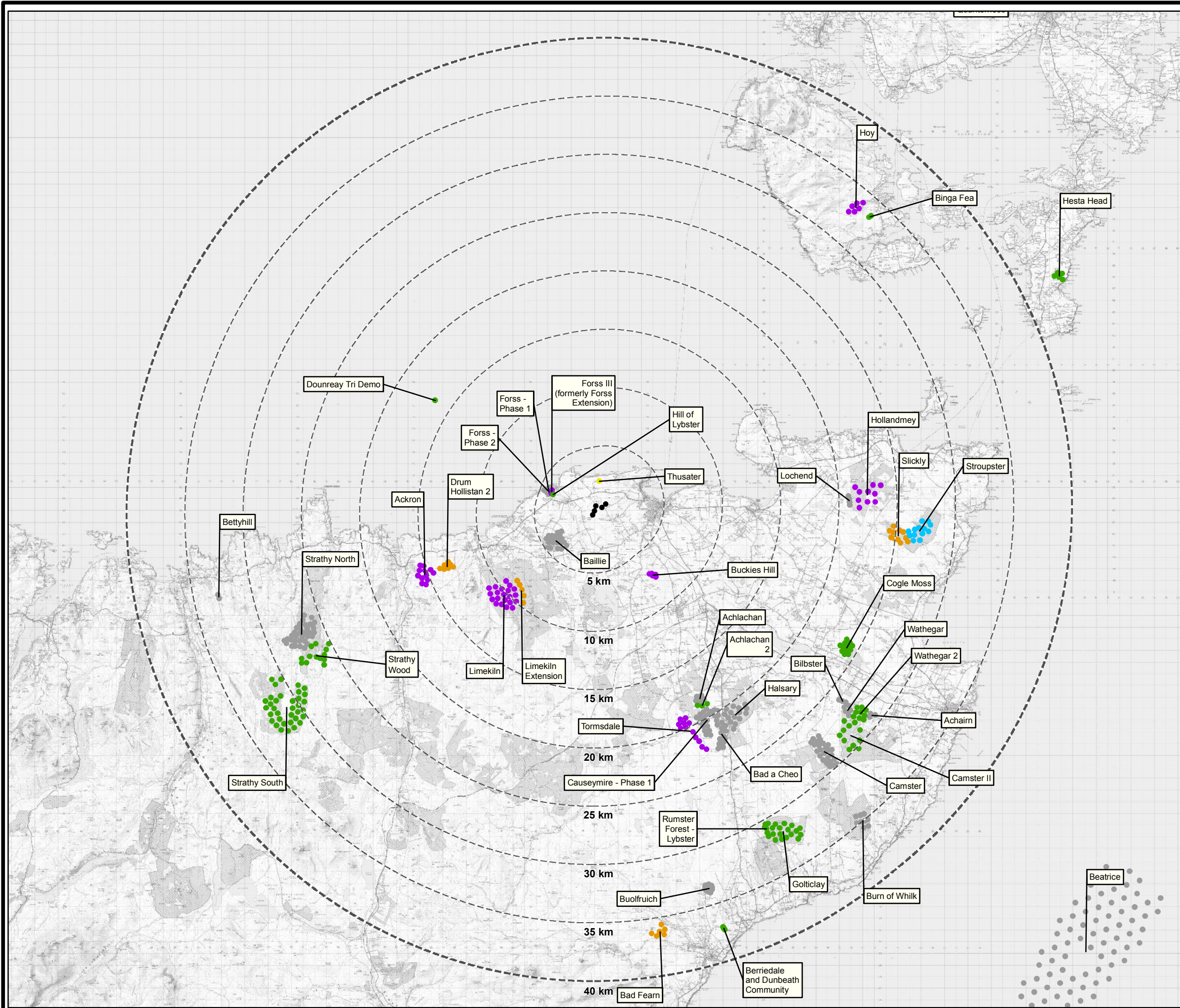
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CAIRNMORE HILL WIND FARM

FIGURE 5.4 CUMULATIVE BASEPLAN

CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2022



- Turbine
- 5km intervals from outer turbines
- 40km LVIA study area

Wind Farm Status

- Operational
- Under Construction
- Consented
- Appeal/Public Inquiry
- Application Submitted
- Design/Scoping

Turbines under 50m to tip, single turbines (beyond 5km) and scoping stage schemes (beyond 5km) have been scoped out.



Data source: RES, LUC

LAYOUT DWG
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T-LAYOUT NO.
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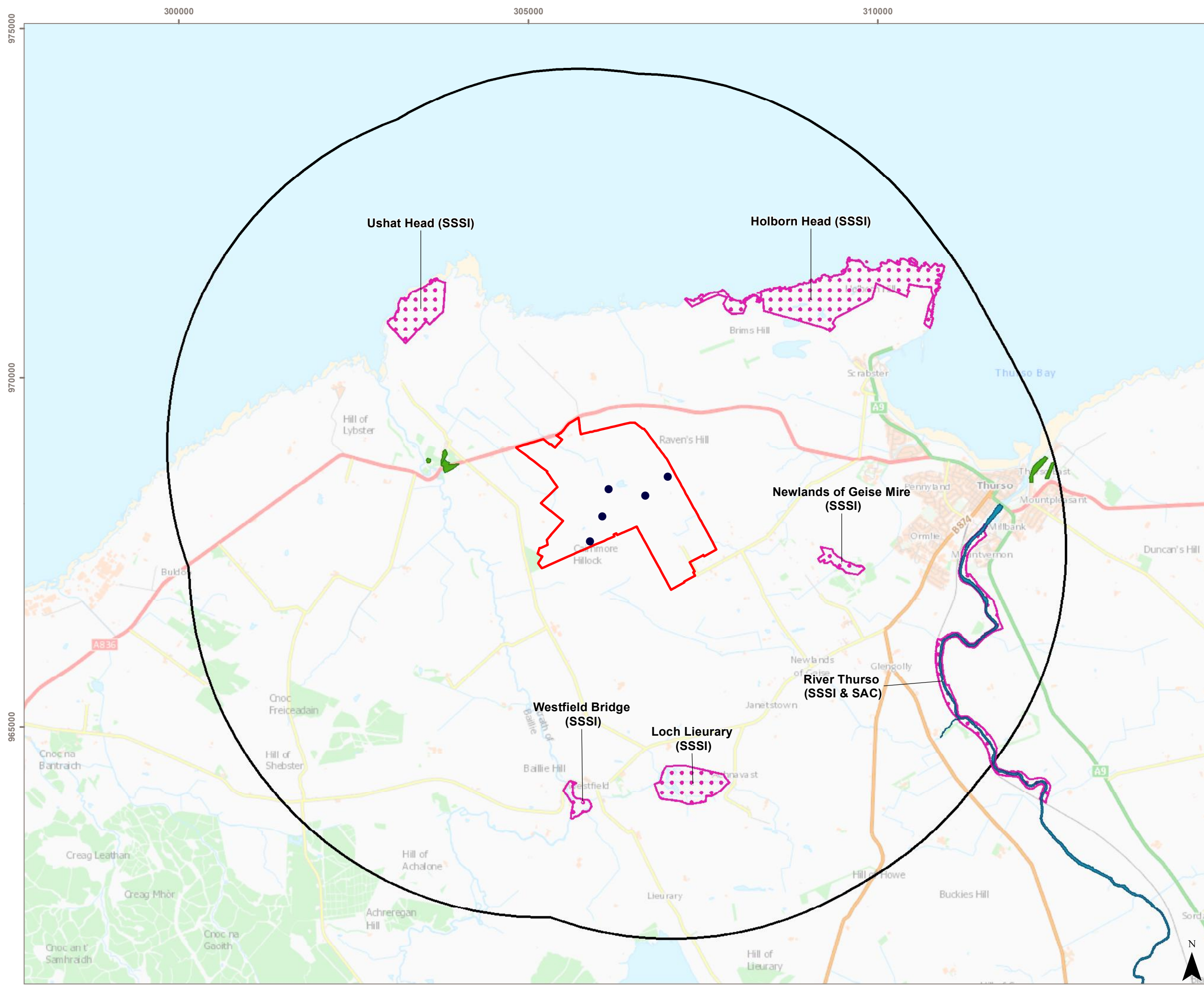
DRAWING NUMBER

FIG5-4_11524_r0_CumulativeBaseplan_A3L

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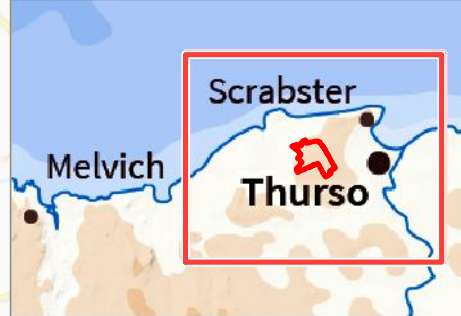
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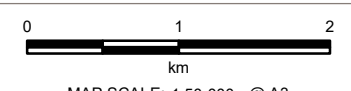
- Legend:
- Turbines
 - Site Boundary
 - 5km Distance Band
 - Special Area of Conservation (SAC)
 - Site of Special Scientific Interest (SSSI)
 - Ancient Woodland

Source: RES, MacArthur Green



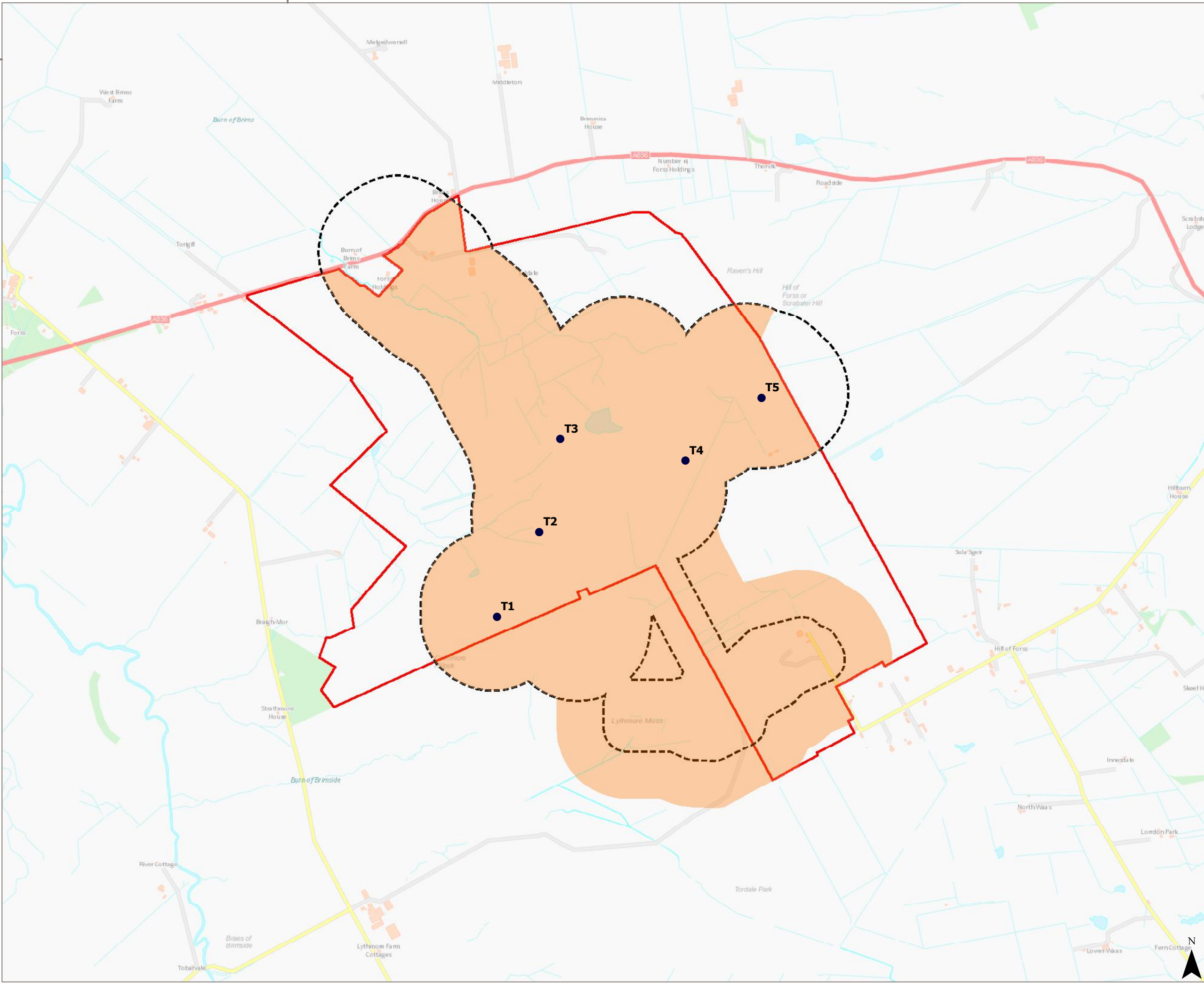
Cairnmore Hill Wind Farm

Figure 7.1
Ecological Designated Sites and Ancient Woodland within 5km



970000

305000



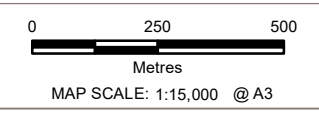
- Legend:
- Turbines
 - Site Boundary
 - Survey Area (2018 and 2019)**
 - NVC and GWDTE
 - Protected Species

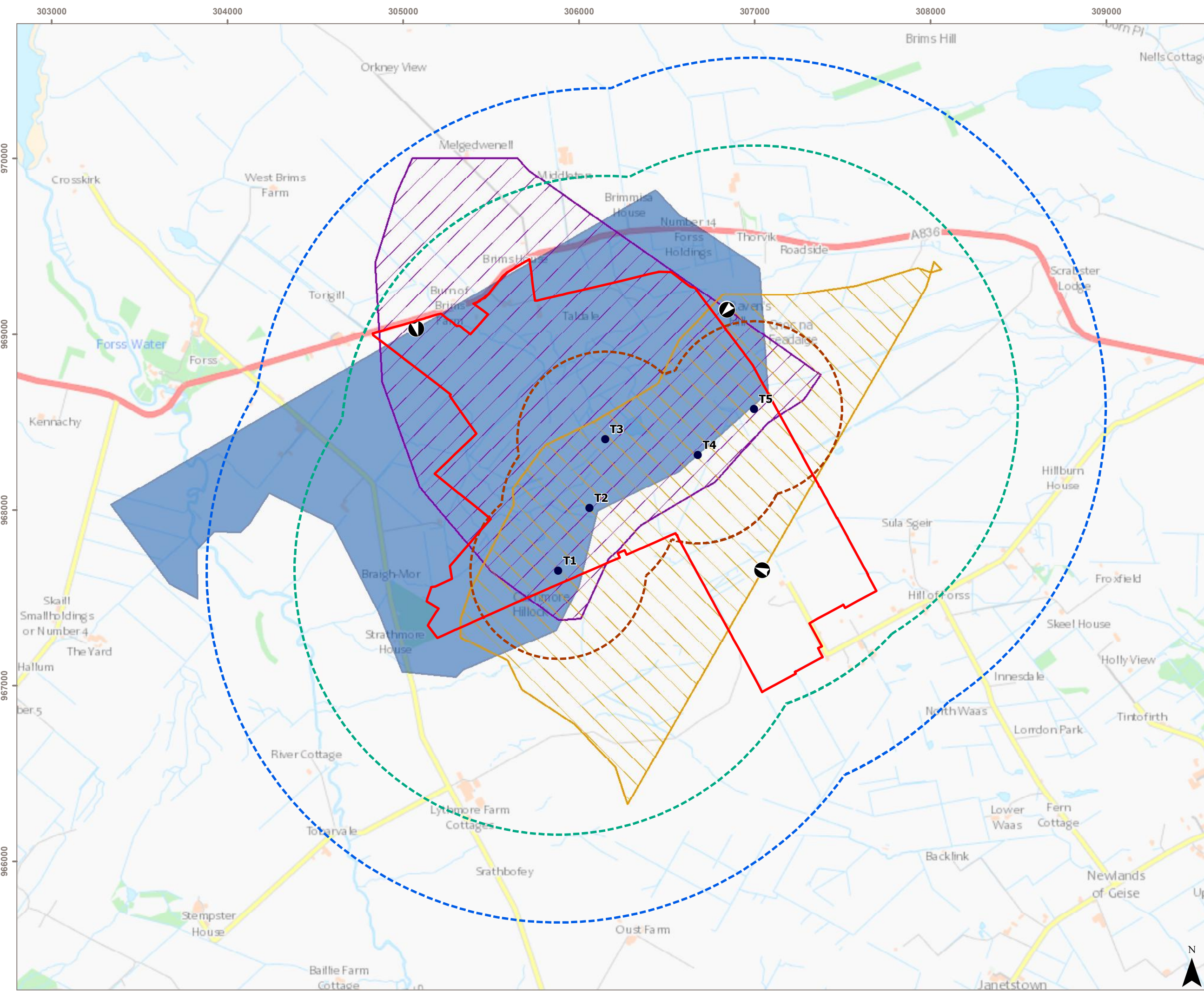
Source: RES, MacArthur Green



Cairnmore Hill Wind Farm

Figure 7.3
Ecological Survey Areas





- Legend:
- Turbines
 - ▭ Site Boundary
 - Vantage Points and Viewsheds**
 - ⊙ Vantage Point
 - ▨ Visible Area From VP1
 - ▨ Visible Area From VP2
 - ▨ Visible Area From VP3
 - Study Areas**
 - 500m
 - 1.5km
 - 2km

Source: RES, MacArthur Green



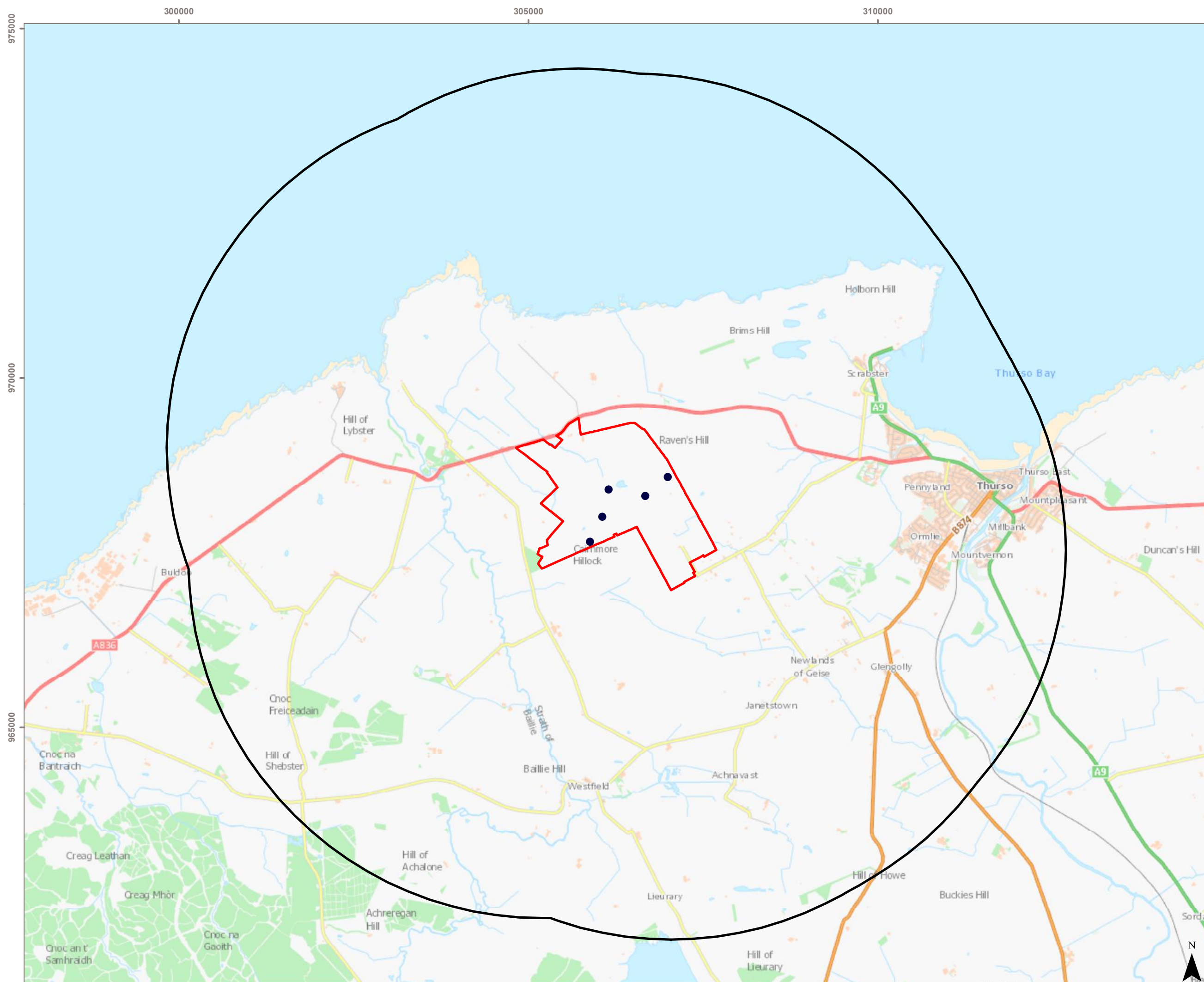
Cairnmore Hill Wind Farm

Figure 7.4

Ornithology Survey Areas

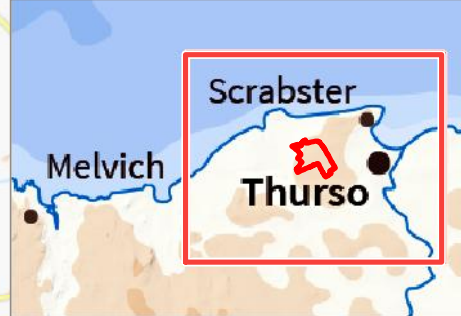
0 0.5 1
km

MAP SCALE: 1:20,000 @ A3



- Legend:
- Turbines
 - Site Boundary
 - 5km Distance Band

Source: RES, MacArthur Green



Cairnmore Hill Wind Farm

Figure 8.1
Hydrology Study Area

