Corkey Windfarm Repowering

Scoping Request

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SCOTTISHPOWER RENEWABLES

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Executive Summary

Introduction and Site Description

1. The existing operational Corkey Windfarm was developed and constructed by RES and B9 Energy Services in 1994, and then acquired by ScottishPower Renewables who now own and operate the site. Corkey Windfarm is located approximately 18 kilometres (km) north of Ballymena in Co. Antrim and consists of ten Nordtank 500 kilowatt (kW) turbines, which can produce up to five megawatts of clean renewable energy. To date, Corkey Windfarm has made an important contribution to Northern Ireland's Renewable Energy targets and low carbon objectives, and the Applicant is seeking to secure and build on this contribution by proposing to 're-power' the Operational Corkey Windfarm.

Windfarm Repowering

2. The repowering of a windfarm involves the removal of existing wind turbines from a site and replacing them with new and more efficient turbines. This process normally results in an increased overall site generating capacity and output as well as generally reducing the total number of turbines within the Site.

3. Repowering a windfarm site supports an ongoing use of the Site by a renewables asset, which is vital to Northern Ireland maintaining and building upon its renewable energy and climate change targets, as outlined in the Strategic Framework for Northern Ireland[1]. Repowering also presents an opportunity to sustain and create additional jobs and to encourage continued investment in the renewable energy industry in Northern Ireland. The repowering of a windfarm differs from that of developing a greenfield site as the area has previously been developed, has demonstrated its suitability for use as a windfarm site, and will continue to be used for the same activity. As a result, the consenting and EIA process can draw on any information already available for the site to assess effects.

4. The Operational Corkey Windfarm is consented in perpetuity, and the repowering of the site with more efficient machines with greater capacity, will maximise the benefits of re-using an existing site whilst minimising new environmental effects. Operating for a longer period will also enable the Applicant to continue to drive down the overall cost of energy benefiting the Northern Irish consumer, and provide opportunities to incorporate emerging technologies such as battery storage.

5. The Applicant and independent technical consultants have been involved in developing, constructing and operating repowered windfarms across the United Kingdom, and have a good understanding of the key planning and environmental sensitivities associated with this type of development.

Purpose of the Scoping Request

6. The aim of the scoping process is to identify key environmental issues at an early stage, to help determine which elements of the proposal are likely to cause significant environmental effects and to identify elements that can be 'scoped out' of the assessment. Comments are invited from the consultees listed in **Section 14** of this Scoping Request, as well as any other interested parties, as to the scope of the Environmental Statement and the methodologies proposed for use in the technical assessments.

[1] Department for the Economy (2010) Strategic Framework for Northern Ireland. Available online at: https://www.economy-ni.gov.uk/publications/energy-strategic-framework-northern-ireland [Accessed on 27/06/2017

7. Following preliminary consultation with key consultees, desk based assessments, site visits and field surveys, and in line with The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 ('the EIA Regulations') this Scoping Report aims to focus the assessment solely on those elements likely to provide a significant effect and identify those topics / factors which can be scoped out as the effects are not likely to be significant. **Table A** below provides a summary of effects that are deemed to be not significant and therefore will not be considered further within the Environmental Statement for the repowering of Corkey Windfarm. The evidence, on which these decisions have been based, is described within each technical section of this Scoping Report.

Table A. Technical Topics which can be scoped out as Not Significant

Technical Area	Elements to be Scoped Out of the EIA
Landscape and Visual Amenity	• All Landscape Character Areas beyond 15 km of the site; • Four Landscape Character Areas within 15 km of the Site; • 34 Gardens and Designed Landscapes; • 2 Areas of Outstanding Natural Beauty; • 1 Area of High Scenic Value; • Settlements beyond 20 km; • Rail and road routes beyond 10 km; and • Regional and national cycle routes and links beyond 15 km.
Ecology	• Upland acid grassland and improved grassland habitats; • Rare or protected flora; • All terrestrial mammals other than badger; • Common lizards and smooth newts; • Marsh fritillary butterflies or any other protected / priority invertebrates; and • Direct effects on fisheries.
Ornithology	• Collision risk modelling for golden plover; and • Direct effects on curlew territories.
Noise	• Low Frequency Noise; and • Amplitude Modulation.
Archaeology and Cultural Heritage	• Indirect effects on heritage assets not within the Zone of Theoretical Visibility.
Access, Transport and Traffic	• Operational traffic assessment.
Hydrology, Hydrogeology, Geology, Soils and Peat	• Receptors beyond 10 km of the Site; and • Effects on Bush Reservoir.
Tourism, Recreation and Socio-Economics	• Direct effects on tourism and recreation receptors.
Other Issues	• Turbine reflectivity; • The vulnerability and resilience of the development to climate change effects; and • Waste.

It is anticipated that, as further information becomes available following the completion of the survey work and refinement of the design, there may be potential to scope out additional elements/topics prior to the submission of the Environmental Statement (see **Table B**). This would only occur following direct consultation and agreement with the relevant consultees.

Table B. Technical Topics with the potential to be scoped out as Not Significant following further consultations and / or layout refinement

Technical Area	Elements with the potential to be Scoped Out of the EIA following further consultation and / or layout refinement
Landscape and Visual Amenity	• It may be possible scope out further receptors. This will be based on layout refinement and further assessment.
Ecology	• Possible indirect effects on fisheries and other aquatic fauna in the Killagan Water, the Maine River and the Lough Neagh / Lough Beg Special Protection Area due to surface water runoff from the Development during both the decommissioning / construction and operational phases.

Ornithology	• Subject to further assessment it may be possible to scope out additional elements, this will be based on layout refinement and further assessment. and includes:
	  • Red grouse
	  • Goose / Swan flights
	  • Non breeding Golden Plover

Noise	• Detailed Construction Noise Assessment • The location of the battery storage facility will be sensitively sited taking into account any identified separation distances to ensure no significant effects. It is therefore anticipated that the resulting noise levels will be sufficiently low as to allow the facility to be scoped out.
Archaeology and Cultural Heritage	• Known archaeology will be avoided during site design, where possible, following layout refinement. • The assessment of indirect effects on Nationally Designated Sites (Listed Buildings and Scheduled Monuments) that are within 5 km and fall within the Zone of Theoretical Visibility (ZTV) will be considered. For the purposes of evaluating indirect effects upon the setting of heritage assets, designation status, proximity to the Development, will be the determining attributes for whether further assessment is required. The final list of assets requiring assessment will be agreed during consultation.

Access, Transport and Traffic	• The following potential effects may be scoped out subject to the defined delivery routes and identified management measures considered within the ES:
	  • Hazardous Loads;
	  • Pedestrian Delay;
	  • Noise and Vibration;
	  • Visual Effects;
	  • Air Quality, and
	  • Severance.

Hydrology, Hydrogeology, Geology, Soils and Peat	• Should no public or private water supplies be identified within 2 km of the Site then effects on these receptors will be scoped out.
Tourism, Recreation and Socio-Economics	• Should further tourism receptors be identified within 10 km of the Site Boundary as part of the ongoing desk based assessment and consultation process, these will be considered in terms of indirect visual effects. These may be scoped out of further assessment should these effects be considered not significant.
Other Issues	• All telecoms links beyond stated buffer distances from the final turbine positions will be scoped out of the assessment. Within these distances only those telecoms links serving the Operational Corkey Windfarm will be discounted and therefore scoped out of the assessment. • At the time of writing, consultation with infrastructure providers had not been concluded. Once all information from the providers has been collated it may be possible to scope out effects on television and other infrastructure. • Should no properties lie within 10 rotor diameters and 130 degrees of north of the turbine positions, with windows facing the Development, potential shadow flicker effects would be scoped out. • It is anticipated that the Development will not cause a significant effect on aviation interests.

Technical Area	Elements with the potential to be Scoped Out of the EIA following further consultation and / or layout refinement
	The scope of any aviation impact assessment, if required, will be based on the outcome of consultation with the relevant aviation consultees. • Human Health Impact Assessment,

Terminology

Table C summarises the key terms (unless otherwise redefined in a Technical Chapter) used throughout this Scoping Request.

Table C: Key Terms and Definitions

Term	Definition
The Site	Refers to all land that falls within the red line boundary identified in **Figure 1.1** of Appendix B.
The Site Boundary	Refers to the red line boundary as identified within **Figure 2.1** of Appendix B.
Operational Corkey Windfarm	Refers to the existing Corkey windfarm at the Site which has been operational since 1994.
The Development	Refers to the application for the repowering of the Operational Corkey Windfarm the details of which are set out within **Section 3: Proposed Development** of this Scoping Request.
Survey Areas	Refers to areas within which surveys are undertaken. These are specifically defined within each technical section.
Study Areas	Refers to areas which are considered as part of the assessment process. These are specific and defined within each technical section.
Indicative Developable Area	Refers to an indicative area within the Site Boundary where turbines may be located, as shown in **Figure 1.2** of Appendix B.
The Council	Refers to the Causeway Coast and Glens Borough Council.

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Corkey Windfarm Repowering
Scoping Request

1 Introduction

1.1 Purpose of the Scoping Request

1. This report constitutes the request for a Scoping Opinion in respect of an application for planning permission to repower the currently Operational Corkey Windfarm ('the Development'), approximately 18 kilometres (km) north of Ballymena in Co. Antrim, Northern Ireland. The location is shown on **Figure 1.1** of Appendix B. This Scoping Request has been prepared by Arcus Consultancy Services Ltd ('Arcus') with input from independent specialist consultants, on behalf of ScottishPower Renewables ('the Applicant').

2. Based on the site area, potential turbine capacity, and what is currently known about the onsite environmental and technical constraints, it is believed that the installed capacity of the Development will be less than 30 megawatts (MW), and therefore an application for planning permission will be made under the provisions of The Planning Act (Northern Ireland) 2011. It is anticipated that this application will require an Environmental Impact Assessment ('EIA') under Schedule 2 of The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 ('the EIA Regulations'). The findings of the EIA will be presented within an Environmental Statement ('ES') which will accompany a planning application to be submitted to the Causeway Coast and Glens Borough Council ('the Council').

The aim of the scoping process is to identify key environmental issues at an early stage, to help determine which elements of the proposal are likely to cause significant environmental effects, and to also identify elements of the EIA that can be 'scoped out' of the assessment. Comments are invited from consultees listed in **Section 14** of this Scoping Request and any other interested parties as to the scope of the ES and the methodologies proposed for use in the technical assessments.

1.2 The Applicant

3. ScottishPower Renewables ('the Applicant') is part of the Iberdrola Group, a world leader in clean energy with an installed capacity of over 28,000 megawatts (MW) and the leading wind energy producer worldwide. The Applicant is at the forefront of the development of the renewables industry through pioneering ideas, forward thinking and outstanding innovation which in turn drives economic success.

4. The Applicant is helping to drive the Iberdrola Group's ambition of being the Utility of the Future and, by the end of 2017, they will have 40 operational windfarms producing over 2,500 MW of cleaner energy, including two offshore windfarms. All of the Applicant's operational windfarms are managed through their innovative and world leading control centre at Whitelee Windfarm in Scotland.

5. The Applicant has a long standing interest in Northern Ireland and currently owns and operates five onshore windfarms in the Country (Corkey, Rigged Hill, Callagheen, Elliots Hill and Wolf Bog Windfarms). Through their established presence in Northern Ireland, the Applicant has contributed over £200,000 of community benefits, contributing to a variety of groups and organisations including donations made to and managed by the Fermanagh Trust and funding for local primary schools.

6. Through their offshore windfarm interests, the Applicant was involved in the construction of a £50 million bespoke facility at Belfast Harbour, creating the first purpose built offshore wind installation and pre-assembly harbour in the UK and Ireland and supporting up to 300 jobs in the process. The Applicant is also progressing East Anglia ONE Offshore Windfarm towards construction, and earlier this year Lamprell, in partnership with Harland and Wolff, were awarded a significant foundation

fabrication contract. The value of this contract is circa £30 million providing over 420,000 person-hours. The average labour force will be 200 people across the duration of the project with a peak of around 350 jobs.

7. As the UK's leading onshore wind developer, the Applicant is keen to be a good neighbour and to maximise the local benefits that can be created in the communities where they operate. To date, the Applicant has contributed over £20 million in community benefit to enable communities surrounding onshore windfarms to deliver initiatives across the UK.

1.3 The Operational Corkey Windfarm

8. The Operational Corkey Windfarm operated by the Applicant, consists of ten 500 kilowatt (kW) Nordtank turbines with a tip height of 57 metres (m) and associated infrastructure including access tracks, control building and a meteorological mast. Based on over 20 years operational experience, Corkey Windfarm is a valuable, high performing operational asset. The site has recorded wind speeds suitable for long term wind generation.

9. The Operational Corkey Windfarm holds a planning consent in perpetuity. Whilst the 'in perpetuity' consent is unusual for a windfarm, the most recent Scottish Planning Policy published in 2014, relating to renewables now advocates that "*Areas identified for wind farms should be suitable for use in perpetuity*.[2]" Whilst not directly applicable to Northern Ireland, this is the most recent policy published within the UK policy context, and indicates a generally supportive framework for repowering of existing developments to ensure that the use of a suitable site is sustained.

10. The Operational Corkey Windfarm employs permanent staff responsible for daily maintenance and running of the windfarm. In addition to this, local firms hold contracts for ongoing civil, electrical and general site maintenance. Further information relating to existing contracts and employment opportunities is provided in **Section 12: Tourism Recreation and Socio Economics**.

1.4 Principles of Repowering

11. The repowering of a windfarm involves the removal of existing wind turbines from a site and replacing these with new and more efficient turbines. The benefit of undertaking this process is an increased overall generating capacity and output, as well as a reduction in the total number of turbines within the site.

12. Repowering a windfarm site offers the ongoing use of the Site by a renewables asset, which is vital to Northern Ireland maintaining and building upon renewable energy and climate change targets, as outlined in the Strategic Framework for Northern Ireland[3]. Repowering also presents an opportunity to sustain and create additional jobs, and to encourage continued investment in the renewable energy industry. This has already been demonstrated through the award of large construction contracts, such as those at Belfast Harbour, which utilise and build upon the existing skills base already present in Northern Ireland to serve both local projects and those further afield.

13. The repowering of a windfarm site differs from that of developing a greenfield site as the area has already been successfully developed and proven to be suitable for windfarm development. As it will continue to be used for the same activity, the consenting and EIA process can draw on any information already available for the site to inform and assess effects.

14. As well as the inherent benefits of creating and expanding upon the existing mix of renewables in Northern Ireland's electricity system, repowering offers a number of major opportunities:

- Increased site generation;
- Reduces dependency on fossil fuels resulting in lower carbon dioxide (CO_2) emissions and output;
- Reduced number of turbines, utilising the latest turbine technology, sustaining and growing the level of renewable energy in Northern Ireland;
- Sustains existing development and construction jobs and creates opportunities for new supply chain jobs;

[2]The Scottish Government (2014) Scottish Planning Policy, Paragraph 170, Page 6. Available online at: http://www.gov.scot/Publications/2014/06/5823/6 [Accessed on 27/06/2017]

[3] Department for the Economy (2010) Strategic Framework for Northern Ireland. Available online at: https://www.economy-ni.gov.uk/publications/energy-strategic-framework-northern-ireland [Accessed on 27/06/2017]

- With a supportive planning framework, it can help create a long-term, stable investment platform for a clear pipeline of repowering projects, easing pressure on consenting authorities; and
- Utilises over two decades of industry knowledge to inform and improve the siting, design and construction techniques to create more efficient projects.

15. To date, the Applicant has experience of developing, constructing and operating repowered projects throughout the UK, including Carland Cross Windfarm in Cornwall, Coal Clough Windfarm near Burnley and Llandinam Windfarm in Wales.

16. The Operational Corkey Windfarm is consented in perpetuity, and the repowering of the windfarm with more efficient machines will maximise the benefits of re-using an existing site whilst minimising new environmental effects. Operating for a longer period will also enable the Applicant to continue to drive down the overall cost of energy with benefits to the Northern Irish consumer, and provides opportunities to incorporate emerging technologies such as battery storage.

2 Environmental Impact Assessment

1. Environmental Impact Assessment (EIA) is a legal requirement for certain types of development. In determining the EIA requirement for wind turbine developments of less than 30 MW capacity, the decision on whether or not an EIA is required is delegated to local authorities. Under Schedule 2 of The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 ('the EIA Regulations'), the Development falls under subsection 3(j): *"Installations for the harnessing of wind power for energy production (wind farms)', where: '(i) the development involves the installation of more than 2 turbines; or (ii) the hub height of any turbine or height of any other structure exceeds 15 metres*." Given the scale of the Development and the potential for significant effects to occur as a result of the Development, the Applicant has elected to undertake an EIA without seeking a screening opinion from the Council.

2. Schedule 4 of the EIA Regulations details what information is required to be included within the Environmental Statement (ES) and states:

3. "*3. A description of the relevant aspects of the current state of the environment (the "baseline scenario") and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge*.

4. *4. A description of the factors specified in regulation 5(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape*."

5. The results of the EIA will be presented in an ES which, as prescribed in the EIA Regulations, is required to include a *"description of the likely significant effects"* of the Development; effects which are not considered to be significant do not need to be described. It is therefore necessary for the scope of the EIA to be appropriately and clearly defined to ensure that any likely significant effects are identified, described and assessed.

2.1 Scope of the EIA

6. In line with the new EIA Regulations which came into force in May 2017, the purpose of the Scoping Request is to ensure that the EIA focuses on only those issues which are likely to give rise to significant environmental effects and to 'scope out' those aspects that will not.

7. In light of this we have sought to advance the collation of baseline information, by undertaking early stage consultation, field surveys and desk based assessment for each technical areas shown below. The findings are described in the following sections of the Scoping Request, and together with professional judgement, form the basis of the recommendation to 'scope in' or 'scope out' each element of the assessment.

8. This Scoping Request provides details of the technical assessment areas proposed for inclusion within the ES, which will meet the information requirements set out in Schedule 4 of the EIA Regulations, and provide an evidence base to support the case for 'Scoping Out' those aspects which can be assessed at this stage as not likely to give rise to significant environmental effects. These assessment areas are detailed in **Sections 5 to 13** of this Scoping Request, and comprise of the following:

- Landscape and Visual Amenity;
- Ecology;
- Ornithology;
- Noise;
- Archaeology and Cultural Heritage;
- Access, Transport and Traffic;
- Hydrology, Hydrogeology, Geology, Soils and Peat;
- Tourism, Recreation and Socio-economics; and
- Other Issues.

9. Baseline information has been gathered, or is in the process of being gathered through a combination of consultation, field surveys and desk based assessment for each of these technical areas. The results of which are described in the following sections. These results, together with professional judgement form the basis of the recommendation to "scope in" or 'scope out' each element of the assessment.

10. It is anticipated that, as further information becomes available following the completion of the survey work and refinement of the design, there may be further potential to scope out additional elements of the assessment. This would only occur via the ongoing consultation process, and agreement with the relevant consultees.

11. A summary is provided within each assessment area confirming which topics/elements are to be included within the ES, those with the potential to be scoped out at a later stage, and those which can be scoped out of any further assessment at this stage.

2.2 Approach to the EIA Process

12. As stated previously, EIA is an iterative process aimed at identifying and assessing the potential effects arising as a result of a proposed development. The initial stage is avoidance through design (embedded mitigation), whereby the Applicant will use the information gathered, to avoid locating infrastructure in sensitive areas. Where significant effects cannot be avoided, suitable mitigation measures to reduce or offset these will be proposed. In addition, the EIA can be used to identify potential enhancement measures that could be applied to maximise beneficial effects.

13. In this case, the Operational Corkey Windfarm has been operating for over 20 years and holds a consent in perpetuity. Therefore the baseline scenario for the EIA is not that of an undisturbed greenfield site. The baseline includes the land use conditions at the current time. This incorporates all existing site infrastructure, access tracks, hardstandings, cables, substation building as well as the wind turbines and foundations as well as the current land use management. The assessments will therefore use a "with windfarm" scenario as the current baseline.

14. The main steps of the EIA process are broadly summarised as follows:

- **Scoping**: The Scoping Opinion from the Council will be used to inform and focus the scope of the EIA on likely significant effects that could be anticipated to occur as a result of the Development;
- **Baseline studies**: Desk-based assessment, baseline surveys and site visits will be undertaken, where appropriate, in order to determine the baseline conditions of the environment and area that may be affected by the Development;
- **Predicting and assessing effects**: Potential interactions between the Development and the baseline conditions will be considered. The nature of the effects, e.g. direct or indirect; positive or negative; long, medium or short term; temporary or permanent, will be predicted and assessed. Potential cumulative effects arising from Development in conjunction with other operational, under construction, consented or application stage developments developments will also be considered;
- **Mitigation and assessment of residual effects**: Potential effects will be avoided or reduced wherever possible through embedded mitigation. Where this is not possible, operational mitigation or other measures to reduce and/or offset any remaining significant effects will be proposed. The residual effects will then be assessed to determine any effects predicted to remain significant following implementation of the recommended mitigation measures; and
- **Production of the ES**: The process and results of the EIA will be set out in the ES.

2.2.1 Assessment Methodology

15. In order to assess the potential effects arising from the Development, the significance of such effects will be determined. The determination of significance relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the effect. The assessment of effects will combine professional judgement together with consideration of the following:

- The sensitivity of the resource or receptor under consideration;
- The magnitude of the potential effect in relation to the degree of change which occurs as a result of the Development;
- The type of effect, i.e. adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring, i.e. certain, likely or unlikely; and
- Whether the effect is temporary, permanent and/or reversible.

16. A generalised methodology for assessing significant effects is detailed below; however each individual technical area will have a specific assessment methodology which may vary from that detailed in the following subsections.

17. It is proposed to continue the 'in perpetuity' nature of the existing consent, Therefore the assessment of all technical areas considers the effects of the operational phase of the Development, without time limitations. Should decommissioning of the Development be required it is considered that the effects resulting from this activity/phase will be less than those resulting from the combined decommissioning/ construction phase associated with the removal of the Operational Corkey Windfarm and the construction of the Development, and as such this decommissioning phase has been discounted from further assessment.

2.2.1.1 Sensitivity of Receptors

18. The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Site or the sensitivity of potentially affected receptors, will be assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement.

19. **Table 2.1** details a general framework for determining the sensitivity of receptors. Each technical assessment will specify their own appropriate sensitivity criteria that will be applied during the EIA and details will be provided in the relevant ES Chapter.

Table 2.1: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

2.2.1.2 Magnitude of Effect

20. The magnitude of potential effects will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an effect and professional judgement, best practice guidance and legislation.

21. General criteria for assessing the magnitude of an effect are presented in **Table 2.2**. Each technical assessment will apply their own appropriate magnitude of effects criteria during the EIA, with the details provided in the relevant ES chapter.

Table 2.2: Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

2.2.1.3 Significance of Effect

22. The sensitivity of the asset and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. **Table 2.3** summarises guideline criteria for assessing the significance of effects.

Table 2.3: Framework for Assessment of the Significance of Effects

Magnitude of Effect	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

23. Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light green in the above table.

2.2.1.4 Mitigation

24. Where the EIA identifies likely significant adverse environmental effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures may be embedded in the design or compensatory. Such embedded mitigation measures will likely include the movement or loss of turbines, access tracks and other infrastructure via an iterative design process; and management and operational measures.

25. In the absence of specific Northern Irish planning guidance or advice notes on approach to EIA mitigation, reference is made to the Scottish best practice equivalent. In line with the mitigation hierarchy identified in Planning Advice Note (PAN) 1/2013[4], the strategy of avoidance, reduction, offsetting and compensation seeks:

- First to avoid significant adverse effects;
- Then to minimise those which remain; and
- Lastly, where no other remediation measures are possible, to propose appropriate compensation.

26. In addition, enhancement measures may be incorporated into design of the Development to maximise environmental benefits.

2.2.1.5 Residual Effects

27. Taking cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be re-assessed to determine whether any likely significant residual effects remain.

2.2.1.6 Cumulative Effects

28. At the time of writing it is known that there are other operational wind farms and a number of wind energy proposals such as single wind turbines located in the vicinity of the Site. Known wind energy developments are shown on **Figure 5.5** of Appendix B. Those which are operational, under construction, consented or at application stage will be considered within the cumulative assessment.

29. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from Scottish Natural Heritage (SNH)[5,6] as advised within paragraph 1.3.17 of the Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy'[7]. Cumulative effects, which are the combined effects of two or more similar developments, will be considered for each technical area assessed within the EIA where relevant.

[4] Scottish Government, 2013, Environmental Impact Assessment [Online] Available at: http://www.gov.scot/Resource/0043/00432581.pdf (Accessed 25/04/2017)
[5] SNH, 2005, *Cumulative effect of Windfarms (Version 2)* Available online at: http://www.snh.org.uk/pdfs/strategy/cumulativeeffectsonwindfarms.pdf [Accessed 27/06/2017]
[6] SNH, 2012, *Assessing the Cumulative Impact of Onshore Renewable Energy Developments* Available online at: http://www.snh.gov.uk/docs/A675503.pdf [Accessed 27/06/2017]
[7] Department for the Environment (2009) Planning Policy Statement 18: Renewable Energy. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements/planning_policy_statement_18__renewable_energy__best_practice_guidance.pdf [Accessed on 24/07/2017]

30. The extent of the cumulative assessment relative to each technical assessment will be agreed during the consultation process. For example, the potential landscape and visual effects, which relate to the visibility of the Development, will be much more wide ranging than noise effects, which will be limited to receptors in the more immediate vicinity of the Development. Specific guidance and policy exist for certain technical areas which advise how effects should be considered cumulatively and these will be used where relevant.

2.2.1.7 Alternatives

31. Schedule 4, Part 1 of the EIA Regulations requires an outline of reasonable alternatives (such as technology, location, size and scale) considered by the Applicant, and the main reasons why the Development was chosen, taking into account the environmental effects. In addition the inclusion of the 'do nothing' scenario, which in this case is the continued operation of the Operational Corkey Windfarm, will be provided within the ES.

32. Consideration of alternative designs has already begun. The final layout of the Development will be based on a range of technical criteria, such as separation distances between turbines, wind speed, prevailing wind direction, existing infrastructure, topography, ground conditions, local environmental issues and landscape and visual considerations. The identification of these criteria is an iterative process: as they are identified, the layout of the Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce potential effects through careful design.

33. The ES, which details the findings of the EIA as set out in the EIA Regulations, is required to "*describe the likely significant effects*" of a development. Effects that are not considered significant, individually or cumulatively, do not need to be described to meet the requirements of the EIA Regulations.

2.3 Consultation

34. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the design process. Consultation forms an integral role throughout the EIA process, and following scoping, and prior to submission of the planning application, two rounds of public consultation events will be held in locations near the Site providing members of the public the opportunity to learn more about the proposal and give feedback and comments to the project team. Consultation on specific technical issues has been, and will continue to be, undertaken with relevant consultees, where appropriate, as part of the EIA process.

2.4 Structure and Content of the ES

35. The content of the ES will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The ES will consist of three volumes and a Non-Technical Summary (NTS).

- Volume 1 – Main ES text;
- Volume 2 – Figures; and
- Volume 3 – Technical Appendices.

36. The front end of the main ES text will include:

- An introduction, including a summary of the EIA process and methodology associated with repowering applications;
- Description of the site and its surroundings;
- Details of alternatives considered and the Development; and
- A summary of the relevant planning policy and environmental context.

37. The technical chapters of the ES will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

2.5 Grid Connection

38. As required by PPS18 Renewable Energy, the Applicant will provide indicative details of the likely routes and the anticipated method of connection (over ground or underground) to the electricity network. This will form a separate document to accompany the ES. The responsibility for the final routing of electrical cabling onwards from the onsite sub-station to the nearest suitable point of the local electricity distribution network is the responsibility of the District Network Operator, presently NIE (Northern Ireland Electricity).

2.6 The EIA Project Team

39. On behalf of the Applicant, Arcus will be responsible for the overall coordination of the EIA and production of the ES with input from independent specialist consultants. **Table 2.4** provides details of the authors and contributors of each aspect of the ES.

Table 2.4: EIA Project Team

ES Chapter		Organisation
Chapters 1 - 4	Introductory ES Chapters	Arcus Consultancy Services Ltd
Chapter 5	Planning Policy Context	Juno Planning & Environmental Ltd
Chapter 6	Landscape and Visual Amenity	Optimised Environments Ltd (OPEN)
Chapter 7	Ecology	NM Ecology Ltd
	Fisheries	Paul Johnston Associates
Chapter 8	Ornithology	Bird Surveyors Ltd
Chapter 9	Noise	Arcus Consultancy Services Ltd and Cassidy Acoustics Ltd
Chapter 10	Archaeology and Cultural Heritage	Arcus Consultancy Services Ltd
Chapter 11	Access, Transport and Traffic	Arcus Consultancy Services Ltd
Chapter 12	Hydrology, Hydrogeology, Geology, Soils and Peat	Arcus Consultancy Services Ltd
Chapter 13	Tourism, Recreation and Socio-economics	Arcus Consultancy Services Ltd and BiGGAR Economics
Chapter 14	Other Issues	Arcus Consultancy Services Ltd

3 The Proposed Development

3.1 Site Description

1. The Operational Corkey Windfarm is located approximately 18 km north of Ballymena in Co. Antrim ('the Site'). The site location is shown on **Figure 1.1** of Appendix B**.** The Operational Corkey Windfarm consists of ten 500 kW Nordtank turbines with tip heights of 57 metres (m) and associated infrastructure including access tracks, control building and a meteorological mast. The 10 existing turbines associated with the Operational Corkey Windfarm are located in two rows running roughly in parallel with the ridgeline.

2. The Site is located on the western periphery of the Antrim Hills with the low-lying valley of the River Main to the west and the broader range of the Antrim Hills to the east. The Site is characterised by the steep upper slopes and distinctive ridgeline of Slievenahanaghan and its moorland land cover. The predominant land use, in conjunction with the Operational Windfarm is agricultural. Elevations within the Site range from approximately 160 m above ordnance datum (AOD) in the south west of the Site to approximately 410 m AOD at the east of the Site.

3. There are a number of small unnamed watercourses and man-made open field drains within the Site, the majority of which drain in a westerly direction although some drain northwards. There are no public roads within the Site and the Operational Corkey Windfarm is currently accessed from Corkey Road, located to the west of the Site.

4. The historical land ownership pattern of this area is based on the land being divided into small plots. This has led to a dispersed settlement pattern, whereby individual dwellings occur frequently across the landscape, accessed by the network of rural roads.

5. Domestic scale and single wind turbines are a frequent feature in the valley landscape, often associated with farmsteads or domestic dwellings. Larger commercial wind farms are also a feature, albeit typically seen set on the enclosing ridgelines of the upland areas to the west and east of the Site. Immediately adjacent to Corkey lies Gruig Windfarm which consists of 10, 2.5 MW turbines with a tip height of 100 m, which contrasts with the 57 m tip height of the Operational Corkey Windfarm turbines.

3.2 The Proposal

6. The Development will continue the current use of the Site, and it's generation of clean electricity from a renewable asset, with the potential to store some of that generated electricity. This can be achieved through decommissioning the existing 10 wind turbines, replacing these with a fewer larger, more efficient machines, and the provision of a battery storage unit. It is also proposed to continue the 'in perpetuity' nature of the existing planning consent.

7. The Development will include:

- Decommissioning of 10 existing wind turbines and replacement with approximately five wind turbines;
- Crane hardstandings;
- New road access junction;
- Upgrade of existing site access tracks and construction of new access tracks;
- Substation;
- Onsite power collection system (turbine transformers and underground cables);
- Permanent met mast;
- Battery storage unit;
- Grid connection; and
- Site restoration.

3.3 Indicative Developable Area

8. At this stage of development, a windfarm layout has not yet been identified; however initial assessments of the Site have identified areas which would be most suitable for development. This area is shown as the 'Indicative Developable Area' on **Figure 2.1** of Appendix B. The extent of the Indicative Developable Area has been determined based on the following constraints:

- Exclusion of areas likely to be active peat;

- Buffer of 50 m around natural watercourses;
- Buffer of 20 m around natural drains; and
- Buffer of 750 m from houses.

9. The Indicative Developable Area shows the location within the Site where turbines are likely to be sited. It should be noted that ancillary infrastructure, such as access tracks, the battery storage unit and the substation, may be located in other locations outside the Indicative Developable Area, as it may be more appropriate to site these off the top of the hill within a more agricultural setting.

10. As part of this Scoping Request, the technical methodologies detailed in **Sections 5 to 13** outline the baseline work undertaken to date, any remaining baseline and survey work to be undertaken, and sets out the scope and approach to the assessment.

11. Following the completion of baseline surveys, a site layout will be finalised. The design will be developed throughout the EIA process and the final design assessed within the ES. We will continue to seek agreement, based on further evidence and consultation, on any additional topics / areas that can be scoped out of the assessment throughout the course of the EIA.

12. Whilst no fixed design has been identified at this stage, **Sections 3.4** to **3.7** detail the likely parameters of components which will make up the Development.

3.4 Wind Turbines

13. A summary of the proposed development details are set out in **Table 3.1**.

Table 3.1: Summary of Proposed Turbines

Number of turbines	Approximately five
Micrositing allowance	50 m
Height of turbines to blade tip	Up to 135 m
Type of turbine	Three bladed, horizontal axis
Generating capacity (per turbine)	Up to 3.6 MW
Total windfarm generation capacity	In the region of 18 MW

14. For the purposes of the EIA, a precautionary approach will be taken and a worst case scenario will be identified and assessed for each receptor as appropriate. It is important to note that the most suitable turbine model for a particular location can change with time, and therefore, a final choice of machine for the Development has not yet been made. The most suitable machine for the Development would be chosen shortly before construction, subject to the procurement process and would be within the overall turbine parameters consented.

3.5 Access and Access Tracks

15. The turbines will be delivered to a nearby port facility capable of handing them (at the time of writing, the Ports of Belfast or Larne are considered to be the most appropriate facilities). The turbine components would then be delivered to the Site using the existing road network, utilising trunk and major roads as far as possible. An access and traffic assessment will be conducted as outlined in **Section 10** of this Scoping Request.

16. Onsite access tracks will be required to provide access from the public highway, access between turbines, the construction compound and substation. These will be constructed of a graded stone and will have a running width of approximately 5 m, which will increase at bends / corners, or as appropriate for the ground conditions. Where possible, and in order to minimise environmental effects, existing access tracks within the Site will be re-used and upgraded as appropriate. Where the existing tracks are not suitable, new access tracks will be constructed to the same specification.

17. Due to the size of the proposed turbine components, the current access serving the Operational Corkey Windfarm is not suitable. Therefore, a new access will be constructed from Reservoir Road to the north of the Site and connected to the existing operational access track. In order to minimise construction effects, stone for construction would be imported from

local quarries, or be re-used from areas of the site where decommissioning / construction activities have generated suitable materials.

3.6 Substation and Grid Connection

18. Underground cabling, laid where possible alongside the access tracks, will link the turbine transformers to a single storey control building. Each turbine transformer will be located either within the turbine nacelle, within the base of the tower or in a small enclosure at the base of the turbine.

19. A new substation will be required as part of the Development and will be sited appropriately and designed to the standard required by Northern Ireland Electricity (NIE) Networks for the accommodation of substation equipment.

20. It is anticipated that a new connection to the electrical grid will be required to accommodate this Development. Based on initial discussions with NIE to date, the Applicant is currently investigating connecting to the Rasharkin 'cluster' substation. Although the application for connection of the Development to the electrical grid will fall under a separate consenting regime, a high level assessment of possible route options will be carried out, in order to identify and evaluate the potential environmental effects of the proposed grid connection. This will be presented alongside the ES. This assessment will based on a 33 kV overhead wooden pole line, although it is noted that the final routing and form of connection will be determined by NIE.

3.7 Battery Storage

21. The Applicant is investigating the feasibility of installing battery storage unit as part of the Development. This would involve the installation of batteries and inverters housed in racks similar to server units in a self-contained building which will be located on a concrete hard standing area adjacent to the substation. The building would house a number of batteries with the battery storage components contained in sealed units, associated air conditioning systems, an electrical room and a maintenance room. The building, housing the storage equipment itself, would be designed to reflect the vernacular architecture of agricultural farm buildings in the area and would be of similar appearance to the substation. An underground cable will connect the battery storage facility to the onsite substation.

3.8 Decommissioning of the Operational Corkey Windfarm

22. The first phase of the Development will comprise the decommissioning and removal of the existing turbines, external transformers, and wind monitoring masts from the site. It is anticipated that the turbines and external transformers will be carefully dismantled and transported offsite, possibly for resale in the second hand market.

23. The dismantling of the Operational Corkey Windfarm is expected to take approximately two months following an initial period of four weeks during which a temporary decommissioning / construction compound will be constructed and existing tracks and crane hardstandings will be cleared of vegetation and upgraded for use by decommissioning vehicles as required.

24. Following initial track construction and upgrade, cranes will be used to split the turbines into suitable sections, which will then be transported from the Site by heavy goods vehicles (HGVs) or possibly abnormal loads if required for resale. The removal of the turbine components from the Site could therefore result in additional abnormal loads as are required for construction, a final position will be agreed via further consultation. Following removal of the blades, power cables will be disconnected and lowered with control cables left in place, before the tower sections are lowered.

25. Turbine and transformer bases will then be cut to 1 m below the surface and backfilled with suitable topsoil, generated from the construction activities elsewhere in the Site. Those areas of hardstanding and access track which are being reused will be retained, whilst unaffected areas of hardstanding and access track that have already naturally regenerated will be left in situ, reducing any adverse environmental impact caused by their removal.

26. All waste material arising from the decommissioning phase will be disposed of responsibly and in accordance with relevant waste management regulations prevailing at the time.

3.9 Construction of the Repowered Corkey Windfarm

27. It is expected that the construction phase of the Development will run in parallel with the decommissioning of the existing windfarm and take approximately 8 months in total, depending on the final layout. This period is somewhat weather dependent and could be affected by onsite conditions. It is envisaged that the construction programme would follow the broad outline as detailed in **Table 3.2** below.

Table 3.2: Indicative Construction Programme

Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
Site Establishment								
Decommissioning of existing turbines								
Access road construction								
Excavation and construction of turbine foundations and hardstandings								
Cable installation and electrical works								
Turbine delivery and erection								
Turbine commissioning								
Site restoration								

3.10 Decommissioning of the Repowered Windfarm

28. In the event that the repowered windfarm requires to be decommissioned, the process would be similar to the decommissioning of the Operational Corkey Windfarm. Given the fewer number of turbines, the potential effects arising from such decommissioning will be less than the effects arising as a result of the combined decommissioning and construction phase described above, these phases combined are therefore considered to represent the worst case parameters for assessment purposes.

4 Policy and Legislative Context

4.1 Introduction

1. This section of the Scoping Request outlines the planning legislative context for the Development as well as identifying the key policy documents of relevance to the Development which will be considered throughout the Environmental Impact Assessment (EIA).

2. It is envisaged that the documents identified within this section will be considered in further detail during the preparation of the planning application for the Development.

4.2 Renewables and Northern Ireland

3. In 2010, the Department for Enterprise, Trade and Investment (DETI) published the Strategic Energy Framework (SEF)[8] which detailed NI's energy future over the next ten years and set the renewable electricity targets for 2020- identifying that 40% of electrical energy needs to be sourced from renewables by 2020. The Department for Economy's statistics on 'Electricity Consumption and Renewable Generation in Northern Ireland (June 2017) latest results show that:

- For the twelve months period of April 2016 to March 2017, 27.1% of total electricity consumption in Northern Ireland was generated from renewable sources located in Northern Ireland. This represents an increase of 1.6 percentage points on the previous twelve months period (April 2015 to March 2016) and is the highest rolling twelve months.
- Of all renewable electricity generated within Northern Ireland over the twelve months period April 2016 to March 2017, 82.8% was generated from wind. This compares to 87.6% for the previous twelve months period (April 2015 to March 2016).

4. It is noted that in the Planning Appeals Commission (PAC) Decision (Appeal Ref 2009/A0363),the Commissioner T. A . Rue acknowledged that "*it is noteworthy that the 40% is a minimum target and not a cap*".

5. The 2010 SEF[8] notes that electricity generated by onshore wind farms is the most established, large-scale source of renewable energy in Northern Ireland. It also states that onshore wind farms will play a vital role in meeting the new renewable electricity target.

6. The Northern Ireland Investment Strategy 2011-2021[9] highlights the importance of renewable sources in electricity generation. The long-term targets are emphasised, underlining that the UK Climate Change Act 2008 legislated for an 80% mandatory cut in the UK's carbon emissions by 2050 (compared to 1990 levels), with a target of 35% by 2025.

7. The Onshore Renewable Energy Action Plan 2013-2020[10] considers the contribution of onshore renewable technologies to the 40% renewable energy target by 2020 and recognises the impact that onshore wind has on the electricity network in Northern Ireland.

8. The Development will contribute towards meeting the Northern Irish key renewable targets through the repowering of the Operational Corkey Windfarm which will result in an increased overall generating capacity as well as securing continuity of renewable energy provision.

4.3 Planning Legislative Context

9. **Table 4.1** outlines the Northern Ireland planning legislative (primary legislation and subordinate legislation) context for the Development.

[8] Department of Enterprise, Trade and Investment (2010). Strategic Energy Framework. Available online at: https://www.economy-ni.gov.uk/publications/energy-strategic-framework-northern-ireland [Accessed on 07/07/2017]
[9] Northern Ireland Executive (2015). Investment Strategy for Northern Ireland 2011 – 2021. Available online at: https://www.infrastructure-ni.gov.uk/publications/investment-strategy-northern-ireland-2011-2021 [Accessed on 07/07/2017]
[10] Department of Enterprise, Trade and Investment (2013). Onshore Renewable Electricity Action Plan. Available online at: https://www.economy-ni.gov.uk/articles/onshore-renewable-electricity-action-plan [Accessed on 07/07/2017]

Table 4.1: Northern Ireland Planning Legislation Context

Northern Ireland Planning Legislation	
Primary Legislation	
The Planning Act (Northern Ireland) 2011	The Planning Act (NI) 2011 Act provides the legislative basis for the Northern Ireland planning system including the development management systems, development plan preparation, planning appeals and enforcement and the way in which these functions are delivered.
Subordinate Legislation	
The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017	The legislative framework for EIA is set out by the EIA Directive (European Directive 2014/52/EU amending Codified EIA Directive 2011/92/EU). The requirements of the EIA Directive in NI are transposed by the Planning (Environmental Impact Assessment) Regulations (NI) 2017 (the EIA Regulations). The EIA Directive aims to ensure that a planning authority granting planning permission for a development proposal makes its decision with the full knowledge of any likely significant effects on the environment by setting out a procedure known as environmental impact assessment to assess such effects. Reasons for determination and decisions must be provided and shared with the public
The Planning (General Development Procedure) Order 2015 (as amended 2016)	The main purpose of the Planning (General Development Procedure) Order 2015 (as amended 2016) is to transfer the necessary powers required to operate the planning system currently contained within the Planning (General Development) Order 1993 (the 1993 GDO) to the councils. It also introduces some new provisions, namely: • Design and access statements for major applications; • Non-material changes to a previous grant of planning permission: • Publicity of applications for planning permission; and • Changes to the statutory consultation process.
The Planning (Development Management) Regulations (Northern Ireland) 2015	The Planning (Development Management) Regulations (NI) 2015 sets out the details of key elements of the development management process in relation to the new hierarchy of development, pre-application community consultation, pre-determination hearings and schemes of delegation while also making a transitional provision.
The Planning (Fees) Regulations (Northern Ireland) 2015 (as amended)	The effect of the Planning (Fees) Regulations (NI) (as amended) is to provide for the charging of a fee for the processing of a planning application.

4.3.1 The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017

10. The Development is classified as 'Schedule 2' development as detailed in the EIA Regulations 2017. See **Section 2**: **Environmental Impact Assessment** of this Scoping Request for further details on The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017.

4.4 Planning Policy Context

11. **Table 4.2** outlines the Northern Ireland planning policy context. The planning policy context identifies relevant planning policy at a regional and local planning policy level. The Planning Statement, which will be submitted alongside the ES, and the technical ES Chapters will assess the Development against the national and local policies outlined below.

Table 4.2: Northern Ireland Planning Policy Context

Planning Policy Document	Key Policies
Regional Development Strategy (RDS) for Northern Ireland 2035	The RDS outlines 'Regional Guidance' (RG) which applies to everywhere in the region and is presented under 3 sustainable themes of Economy, Society and Environment. • RG5 - Deliver a sustainable and secure energy supply; • RG9 - Reduce our carbon footprint and facilitate mitigation and adaptation to climate change whilst improving air quality; and • RG11 - Conserve, protect and, where possible, enhance our built heritage and our natural environment.
Strategic Planning Policy Statement for Northern Ireland (SPPS) September 2015	SPPS Subject Policies: • Archaeology and Built Heritage (Para 6.1- 6.30); • Development in the Countryside (Para 6.61- 6.78); • Flood Risk (Para 6.99- 1.132); • Natural Heritage (Para 6.168- 6.198); • Renewable Energy (Para 6.214- 6.234); • Telecommunications and other Utilities (Para 6.235- 6.250); • Tourism (Para 6.251- 6.266); • Transportation (Para 6.293- 6.305); and • Waste Management (Para 6.306- 6.323).
Strategic Planning Policy Statement- Strategic Planning Policy Review for Inshore Renewable Energy Development	A review of planning policies on renewable energy was announced in September 2016. The strategic review is being undertaken by Element Consultants on behalf of the Department for Infrastructure (DfI). DfI Policy section outlined that it is expected that the consultants will complete their review by the end of 2017 with proposed revised draft policy published in June/ July 2018 (tentative dates).
Planning Policy Statement 2 - Natural Heritage	Policy NH1 – European and Ramsar Sites – International Policy NH2 – Species Protected by Law Policy NH3 – Sites of Nature Conservation Importance - National Policy NH4 – Sites of Nature Conservation Importance - Local Policy NH5 – Habitats, Species or Features of Natural Heritage Importance Policy NH6 – Areas of Outstanding Natural Beauty
Planning Policy Statement 3 - Access, Movement and Parking (PPS3,revised 2015)	Policy AMP 1 - Creating an Accessible Environment Policy AMP 2 - Access to Public Roads Policy AMP 3 - Access to Protected Routes (as updated in PPS 3 Clarification) Policy AMP 6 - Transport Assessment Policy AMP 7 - Car Parking and Servicing Arrangements Policy AMP 8 - Cycle Provision Policy AMP 9 - Design of Car Parking Policy AMP 10 - Provision of Public and Private Car Parks Policy AMP 11 - Temporary Car Parks
Planning Policy Statement 6 - Planning, Archaeology & the Built Heritage	Policy BH2 - The Protection of Archaeological Remains of Local Importance and their Settings Policy BH3 - Archaeological Assessment & Evaluation Policy BH 4 - Archaeological Mitigation Policy BH 11 - Development affecting the Setting of a Listed Building
Planning Policy Statement No.10 - Telecommunications	Policy Tel 2 - Development and Interference with Television Broadcasting Services
Planning Policy Statement 13 -	General Principle 5 - Developers should bear the cost of transport

Planning Policy Document	Key Policies
Transportation and Land Use	infrastructure necessitated by their development.
Planning Policy Statement No.16 - Tourism	Policy TSM 8 - Safeguarding of Tourism Assets
Planning Policy Statement No.18- Renewable Energy including PPS 18 Best practice Guidance (BPG) and Supplementary Planning Guidance (SPG)	Policy RE1 - Renewable Energy PPS 18 BPGs outline the use of ETSU-R-97 for noise assessments for windfarm development and guidelines for shadow flicker assessment. The SPGs identify the development as being within 'Landscape Character Area No.118 - Moyle Moorlands and Forest- this LCA is classified as having a 'high- medium sensitivity' for windfarm development.
Planning Policy Statement No.21 - Sustainable Development in the Countryside	Policy CTY 1 - Development in the Countryside Policy CTY 13 - Integration & Design of Buildings in the Countryside.
Local Planning Policy	
The Northern Area Plan 2016 (NAP 2016)	The NAP is the current Local Development Plan for the Causeway Coast and Glens Borough Council (The Council). NAP provides the local planning policy framework. However, it does not contain any specific policies on wind energy or renewable energy projects - therefore PPS18 and the SPPS are the relevant planning policy documents.
Causeway Coast and Glens Borough Council Local Development Plan 2030	The Council are in the preparatory stages of producing a new LDP for the Council area. The published LDP Timetable outlined that the 'Preferred Options Paper' (POP) should be published for consultation in autumn/ winter 2017- the Council has confirmed that they are currently in line with their published LDP Timetable. It is anticipated that Councils preferred options for wind energy development will form part of the 'POP.' The LDP Timetable notes that the Draft Plan Strategy will be issued in autumn 2018 for consultation and aims that the Plan Strategy will be adopted in autumn 2018 following independent examination. The Timetable outlines that the Draft Local Policies Plan will be published for consultation 2020/21 with anticipated adoption in winter 2022. As part of the preparatory studies the following relevant Topic Papers have been presented to the Planning Committee. • Environment; • Landscape Character; • Countryside Pressure Analysis; and • Tourism.

4.4.1 Regional Planning Policy- Strategic Planning Policy Statement (SPPS Transitional Arrangements)

13. A transitional period will operate until such times as the Local Development Plan Strategy for the whole Council area has been adopted. During the transitional period planning authorities will apply existing retained policy together with the SPPS. Relevant supplementary and best practice guidance will also continue to apply. Where a Council adopts its Plan Strategy, existing policy retained under the transitional arrangements shall cease to have effect in the district of that Council and shall not be material from that date, whether the planning application has been received before or after that date.

14. Any conflict between the SPPS and any retained policy (Planning Policy Statements) must be resolved in favour of the provisions of the SPPS. For example, where the SPPS introduces a change of policy direction and/or provides a policy clarification that would conflict with the retained policy the SPPS should be accorded greater weight in the assessment of individual planning applications. However, where the SPPS is silent or less prescriptive on a particular planning policy matter than retained policies this should not be judged to lessen the weight afforded to the retained policy. PPS 18 and its associated best practice guidance (BPG) and supplementary planning guidance (SPG) are retained as planning policy.

15. Policy RE1 of PPS 18 and the SPPS differ in how they describe the weight that should be attached to the Project's wider environmental, economic and social benefits. The SPPS states that these are material considerations that will be given appropriate weight in determining whether planning permission should be granted whereas Policy RE1 states that they should be accorded significant weight. The policy provision of the SPPS should be accorded greater weight in the assessment of individual wind energy planning applications.

4.5 Questions for Consultees

16. Key questions for Consultees are:

- Do Consultees agree with the key policies listed in Table 4.2 against which the effects of the Development will be assessed?
- Are there any other areas of policy and/or guidance Consultees would recommend be included within the ES?
- Do Consultees agree with the description of the transitional arrangements outlined in **Section 4.4.1** above?
- Are Consultees satisfied with the proposal that further areas may be scoped out, with evidence and following consultation, once the detailed design and layout are developed further?
- Are Consultees satisfied that in some areas relating to wind energy development, where there is a clear absence of Northern Ireland planning policy guidance, that reference is made to other jurisdictions for applicable and relevant policy and guidance, for example guidance from the Scottish Government?

5 Landscape and Visual Amenity

5.1 Introduction

1. This section of the Scoping Request sets out the proposed methodology and approach to be applied in the production of the Landscape and Visual Impact Assessment (LVIA) and presents the suggested scope of the LVIA in terms of those landscape and visual receptors to be scoped in and scoped out of the assessment process based on the baseline information and fieldwork undertaken to date to inform the scope of the assessment. Justification of the scope is presented through an initial baseline assessment of the relevant receptors and an initial assessment of their sensitivity to the Development.

2. The purpose of the LVIA is to identify and record the likely significant effects that the Development may have on physical elements of the landscape; landscape character; areas that have been designated for their scenic or landscape-related qualities; and views from various locations such as settlements, routes, hilltops and other sensitive locations. The potential cumulative effects that may arise from the addition of the Development to other existing, under construction, consented and application windfarms are also considered.

3. The LVIA will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This level of landscape and visual change also represents a worst case than the decommissioning of the repowered wind turbines, should it be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

4. Receptors may not be affected at all development stages. This Scoping Request suggests which stages will need to be considered in respect of those receptors requiring detailed assessment.

5. A high level assessment of the options for grid routeing between the Development and the sub-station at Rasharkin will also be undertaken.

5.1.1 The Development

6. The Development is set in the Antrim Hills in County Antrim, Northern Ireland and involves a repowering of the Operational Corkey Windfarm, which comprises ten Nordtank turbines of 39 metre (m) hub height, 37 m rotor diameter and 57 m blade tip height. Constructed in 1994, this wind farm has been present on these hills for 23 years. The existing turbines occupy the summits and upper slopes of Slievenahanaghan (418 m Above Ordnance Datum (AOD)).

7. The Development would see the Operational Corkey Windfarm replaced with in the region of five turbines of a maximum 135 m to tip and associated infrastructure, including a battery storage unit. The larger scale of the turbines will require them to be more widely spaced than the current turbines and therefore, as well as being taller, the fewer turbines will extend across a slightly larger site area. The decommissioning / construction and operational stage elements of the Development are described in **Section 3: The Proposed Development**.

8. The Site lies to the immediate west of the Antrim Coast and Glens Area of Outstanding Natural Beauty (AONB).

5.1.2 Aims

9. The main aim of this section of the Scoping Request is to identify those receptors to be scoped in and out of the LVIA. The process of identification is based on an initial assessment of potential effects. Zone of Theoretical Visibility (ZTV) diagrams have been produced based on a layout comprising in the region of five turbines, in correlation with potential landscape and visual receptors, to ascertain where theoretical visibility may occur. This information has been supplemented by field work to develop an understanding of where actual visibility may occur and to ascertain the sensitivity of the receptors and the potential magnitude of change.

10. In terms of the sensitivity of landscape and visual receptors, the main considerations in the initial assessment include defining the value of the receptor and its susceptibility to the specific impacts of the Development. In terms of magnitude of change, the main considerations include the distance of the receptor from the Development and the level and extent of actual visibility. A summary of the methodology for the LVIA is presented in **Section 5.2**. The initial stages of this methodology have been applied in the preliminary assessment to ascertain which receptors to scope in or out.

5.2 Suggested Methodology

11. This section summarises the methodology and guidance which it is proposed will be used to carry out the LVIA.

5.2.1 Guidance

12. The LVIA will follow Optimised Environment Ltd's (OPEN) methodology devised specifically for the assessment of windfarm developments and generally accords with 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' (GLVIA3)[11], the key source of guidance for LVIA in the United Kingdom (UK).

13. GLVIA3 sets out an approach to the assessment of magnitude of change in which three separate considerations are combined within the magnitude of change rating. These are the size or scale of the effect, its geographical extent, and its duration and reversibility.

14. OPEN considers that the process of combining all three considerations in one rating can distort the aim of identifying significant effects of windfarm development. For example, an increased magnitude of change, based on size or scale, may be reduced to a lower rating if it occurred in a localised area and for a short duration. This might mean that a potentially significant effect will be overlooked if effects are diluted down due to their geographical extents and/or duration or reversibility.

15. OPEN has chosen to keep these three considerations separate, by basing the magnitude of change on size or scale to determine where significant and not significant effects occur, and then describing the geographical extents of these effects and their duration and reversibility separately.

16. Other sources of guidance that will be used and referenced in the LVIA include the following:

- Northern Ireland Environment Agency's (NIEA) *Wind Energy Development in Northern Ireland's Landscapes - Supplementary Planning Guidance to accompany Planning Policy Statement 18 Renewable Energy*[12];
- Scottish Natural Heritage's (SNH) *Siting and Designing Windfarms in the Landscape*[13];
- SNH's *Assessing the Cumulative Impact of Onshore Wind Energy Developments*[14];
- SNH's *Visual Representation of Windfarms: Version 2.2*[15];
- The Landscape Institute's *Landscape Institute Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment*[16];
- Countryside Agency and SNH's *Landscape Character Assessment Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage*[17]; and
- Countryside Agency and SNH's *Landscape Character Assessment Guidance Topic Paper 6: Techniques and Criteria for Judging Sensitivity and Capacity, Countryside Agency and Scottish Natural Heritage*[18].

[11] Landscape Institute (2013) Guidelines for Landscape and Visual Impact Assessment: Third Edition' (GVLIA3)
[12] Northern Ireland Environment Agency (2010). Wind Energy Development in Northern Ireland's Landscapes - Supplementary Planning Guidance to accompany Planning Policy Statement 18 Renewable Energy
[13] Scottish Natural Heritage (2017) Siting and Designing Windfarms in the Landscape
[14] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments;
[15] Scottish Natural Heritage (February 2017) Visual Representation of Windfarms: Version 2.2
[16] The Landscape Institute (2011) Landscape Institute Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment
[17] Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage
[18] Countryside Agency and Scottish Natural Heritage (2004) Landscape Character Assessment Guidance Topic Paper 6: Techniques and Criteria for Judging Sensitivity and Capacity, Countryside Agency and Scottish Natural Heritage

Whilst some of this guidance has been authored in other parts of the UK, aspects of it have been used within recent planning applications for windfarms in Northern Ireland and are becoming standard practice across the UK.

5.2.2 Study Area

17. The initial step in the LVIA is the establishment of the study area for the assessment. An area with a radius of 30 kilometres (km) from the nearest turbine in the Development is proposed as the study area. This aligns with guidance presented in the SPG which accompanies Planning Policy Statement 18[19] which states "*For turbines of medium or large commercial height we would generally recommend a radius of 20-30 km*." A ZTV analysis has been carried out for this area, based on a preliminary turbine layout, as has mapping of landscape character, designations and principal visual receptors. This study area is shown on **Figure 5.1** of Appendix B.

18. The study area is not intended to provide a boundary beyond which the Development will not be seen, but rather to define the area beyond which it is unlikely to have a significant landscape or visual effect. In reality, a significant effect is very unlikely to occur towards the edges of the study area due to a combination of factors such as distance from the Development, which ensures that the turbines will appear as minor features in views and will affect a very limited proportion of the wider views available; and screening by intervening buildings and vegetation.

19. The cumulative landscape and visual assessment also covers a study area of 30 km from the nearest turbine. Due to the nature of the Development as a repowering of an operational windfarm and the cumulative windfarm context within the local area, significant cumulative effects will not arise beyond this and are likely to be substantially more localised. Single turbines are shown within a 5 km radius of the Development. Cumulative Windfarms are shown in **Figure 5.6** of Appendix B.

5.2.3 Desk Study

20. The assessment has been initiated through a desk study of the site and 30 km radius study area. This study has identified aspects of the landscape and visual resource that will need to be considered in the landscape and visual assessment, including landscape-related planning designations, landscape character typology, and potential cumulative windfarms, routes (including roads, railway lines, National Cycle Routes and long-distance walking routes), and settlements.

21. The desk study has also utilised Geographic Information System (GIS) and Resoft Windfarm software to explore the potential visibility of the Development. The resultant ZTV diagrams (**Figures 5.2 to 5.4** of Appendix B) and wirelines used in the field have provided an indication of which landscape and visual receptors are likely to be key sensitivities in the assessment. **Figure 5.5** of Appendix B illustrates the difference in the theoretical visibility of the Operational Corkey Windfarm and the Development.

5.2.4 Field Survey

22. Field surveys have been carried out throughout the 30 km radius study area, although the focus is on the area that covers the site and those areas that are shown on ZTVs to gain theoretical visibility of the Development. The baseline field survey has four broad stages:

- A preliminary familiarisation around the study area in order to visit landscape and visual receptors that have been identified through the desk study and verify their existence and importance. Important features and characteristics that have not become apparent through the desk study are also identified, and particularly sensitive receptors have been noted, in order to inform the design process;
- A visit in the vicinity of the site, in order to establish the potential of the site for windfarm development and identify the most suitable areas for development in landscape and visual terms, along with any constraints that may restrict the developable area;
- Further field survey around the study area, concurrent with the design process for the Development, to identify those receptors that are likely to be important in the assessment and inform the layout design, possible turbine height, and the extent of the Development; and
- The identification of representative viewpoints to include in the landscape and visual assessment, including a wide range of receptors, landscape character, and directions and distances from the Development.

[19] Department for the Environment (2009) Planning Policy Statement 18: Renewable Energy. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements/planning_policy_statement_18__renewable_energy__best_practice_guidance.pdf [Accessed on 06/07/2017]

5.2.5 Categories of Landscape and Visual Effects

23. The LVIA is intended to determine the effects that the Development will have on the landscape and visual resource. For the purpose of assessment, the potential effects on the landscape and visual resource are grouped into four categories:

24. **Physical effects**: physical effects are restricted to the area within the Site Boundary and are the direct effects on the existing fabric of the site. This category of effects is made up of landscape elements, which are the components of the landscape such as rough grassland and moorland that may be directly and physically affected by the Development.

25. **Effects on landscape character**: landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements or through visibility of the Development that may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups: landscape character areas and landscape-related designated areas.

26. **Effects on views**: the assessment of the effects on views is an assessment of how the introduction of the Development will affect views throughout the study area. The assessment of effects on views is carried out in two parts:

- An assessment of the effects that the Development will have on a series of viewpoints around the study area; and
- An assessment of the effects that the Development will have on views from principal visual receptors, which are relevant key settlements and routes found throughout the study area.

27. **Cumulative effects**: cumulative effects arise where the study areas for two or more operational, under construction, consented or application stage windfarms overlap so that both of the windfarms are experienced at a proximity where they may have a greater incremental effect, or where windfarms may combine to have a sequential effect. In accordance with guidance[20], the LVIA assesses the effect arising from the addition of the Development to the cumulative situation. The cumulative situation comprises commercial scale windfarms across the 30 km study area and single turbines within a 5 km radius.

5.2.6 Assessment of Effects

28. The objective of the assessment of the Development is to predict the likely significant effects on the landscape and visual resource. In accordance with planning regulations[21], the LVIA effects are assessed to be either significant or not significant. The LVIA does not define intermediate levels of significance as the regulations do not provide for these.

29. **Section 5.2.5** describes how the landscape and visual assessment is carried out in four categories: the assessment of physical effects; the assessment of effects on landscape character; the assessment of effects on views; and the assessment of cumulative effects. The broad principles used in the assessment of significance of these categories are the same and are described below.

30. The significance of effects is assessed through a combination of two considerations: the sensitivity of the landscape receptor or view and the magnitude of change that will result from the addition of the Development.

5.2.6.1 Sensitivity

31. The sensitivity of a landscape or visual receptor is determined by a combination of the value of the receptor and the susceptibility of the receptor to the change that the Development would have on the landscape character or the view.

32. The sensitivity of the landscape or visual receptor is evaluated as high, medium-high, medium, medium-low or low by combining the value of the receptor and its susceptibility to change. The basis for the assessments is made clear using evidence and professional judgement in the evaluation of each receptor.

[20] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments
[21] The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017

33. The criteria used to assess value and susceptibility in respect of landscape and visual receptors differs slightly as described below.

5.2.6.1.1 Value

34. The value of a landscape character receptor is determined through its importance in terms of any designations that may apply as well as its scenic quality, sense of place, rarity and representativeness. The value is also determined by the experience of the landscape in relation to perceptual responses, cultural associations, its iconic status, its recreational value, and the contribution of other values such as nature conservation or archaeology.

35. The value of a view reflects the recognition and importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s).

36. The value of the landscape or visual receptor is evaluated as high, medium-high, medium, medium-low or low. The basis for the assessments is made clear using evidence and professional judgement in the evaluation of each receptor.

5.2.6.1.2 Susceptibility

37. Susceptibility, in respect of the LVIA, relates to the ability of the landscape or visual receptor to accommodate the changes that would occur as a result of the addition of the Development to the baseline situation.

38. In respect of landscape receptors, considerations include the specific nature of the Development, e.g. its size, scale, location, context and characteristics; the degree to which the receptor may accommodate the influence of the Development; and the extent to which it would influence the character of the landscape receptors across the study area.

39. In respect of visual receptors, considerations include the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the Development. Professional judgement is used based on the occupation or activity which viewers are engaged in at the viewpoint or series of viewpoints. The principal visual characteristics, e.g. those features which define the view and the viewer's experience of the visual receptor in relation to the extent to which their focus is directed towards the view, the duration and clarity of the view and whether it is a static or transitory view, is also considered.

40. The susceptibility of the landscape or visual receptor is evaluated as high, medium-high, medium, medium-low or low. The basis for the assessments is made clear using evidence and professional judgement in the evaluation of each receptor.

5.2.6.2 Magnitude of Change

41. The magnitude of effect, in respect of the LVIA, differs in respect of landscape and visual receptors. The differences are set out below.

5.2.6.2.1 Landscape Receptors Magnitude of Effect

42. The magnitude of effect on landscape character receptors is an expression of the scale of the change that would result from the Development and is dependent on variables relating to the size or scale of the change, its duration and its geographical extent.

43. The basis for the appraised level is made clear using evidence and professional judgement, based on the following criteria:

- The extent of existing landscape elements that would be lost and the proportion of the total this represents as well as the contribution of that element to the character of the landscape;
- The degree to which the pattern of elements that makes up the landscape character would be altered by the Development, i.e. by removal or addition of elements in the landscape;
- The extent to which the effects change the key characteristics of the landscape as identified in the baseline study, which may be critical to the distinctive character of the landscape;
- The distance between the landscape character receptor and the Development. Generally, the greater the distance, the lower the scale of change; and
- The proportion of the Development that would be seen.

44. Intermediate levels may also be included such as medium-high or medium-low, where the change falls between the definitions.

5.2.6.2.2 Views Magnitude of Effect

45. The magnitude of effect on views is made clear using evidence and professional judgement, based on the following criteria:

- The distance between the visual receptor and the Development. Generally, the greater the distance, the lower the magnitude of effect;
- The scale and character of the context within which the Development would be seen. This would determine the degree to which the Development can be accommodated in the existing outlook. The scale of the landform/buildings, the patterns of the landscape, the existing land use and vegetation cover, and the type and form of development seen in the baseline view would all be relevant;
- The extent of the Development that would be seen. Visibility of the Development may range from the full height of the turbines to just the upper parts;
- The position of the Development in relation to the principal orientation of the receptor. If the Development is seen in a specific, directional vista from a receptor, the magnitude of effect would generally be greater; and
- The width of the view available and the proportion of the view that is affected by the Development. Generally, the more of a view that is affected, the higher the magnitude of effect.

46. Intermediate levels may also be included such as medium-high or medium-low, where the change falls between the definitions.

5.2.6.3 Assessment of Significance

47. The significance of effects is assessed through a combination of the sensitivity of the landscape receptor/ view and the magnitude of change that will result from the addition of the Development. While OPEN's methodology is not reliant on the use of a matrix to arrive at the conclusion of a significant or not significant effect, a matrix is included below in **Table 5.1** to illustrate how combinations of sensitivity and magnitude of change ratings can give rise to significant effects. The matrix also gives an understanding of the threshold at which significant effects may arise.

Table 5.1: Significance Matrix

Magnitude Sensitivity	High	Medium-High	Medium	Medium-Low	Low	Negligible
High	Significant	Significant	Significant	Significant / Not Significant	Not Significant	Not Significant
Medium-High	Significant	Significant	Significant / Not Significant	Significant / Not Significant	Not Significant	Not Significant
Medium	Significant	Significant / Not Significant	Significant / Not Significant	Not Significant	Not Significant	Not Significant
Medium-Low	Significant / Not Significant	Significant / Not Significant	Not Significant	Not significant	Not Significant	Not Significant
Low	Significant / Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant

48. Effects within the dark green boxes in the matrix are considered to be significant in terms of the EIA Regulations. Effects within the light grey boxes may be significant or not significant, depending on the specific relevant factors that arise at a particular landscape or visual receptor. In accordance with GLVIA3[11], experienced professional judgement is applied to the assessment of all effects and reasoned justification is presented in respect of the findings of each case.

49. The geographic extent over which the landscape and visual effects will be experienced is also assessed, which is distinct from the size or scale of effect. This evaluation is not combined in the assessment of the level of magnitude but instead is used in determining the extent in which a particular magnitude of change is experienced and the extent of the significant and non-significant effects. The extent of the effects will vary depending on the specific nature of the development proposed and is principally assessed through analysis of the geographical extent of visibility of the Development across the visual receptor.

50. The extent of effects on views is based on the following factors:

- The extent of a receptor (a road, footpath or settlement, for example) from which the Development may be seen; and
- The extent to which the change would affect views, whether this is unique to a particular viewpoint or if similar visual changes occur over a wider area represented by the viewpoint.

51. The duration and reversibility of effects on views are based on the period over which the Development is likely to exist and the extent to which the Development will be removed and its effects reversed at the end of that period. Duration and reversibility are not incorporated into the overall magnitude of change and may be stated separately in relation to the assessed effects. Due to the in perpetuity nature of this Development (and the Operational Corkey Windfarm), the operational effects of it will be long term and permanent.

52. GLVIA3[11] defines 'significance' as "a measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic" (GLVIA3 glossary). It does not define what may constitute a 'significant' effect or provide thresholds that indicate where effects would become significant rather than not significant, but states that "*there are no hard and fast rules about what effects should be deemed 'significant'*" (paragraph 3.32). This is further expanded upon in paragraph 5.54 (in relation to landscape effects), which states that "*significance can only be defined in relation to each Development and its specific location. It is for each assessment to determine how the judgements about the landscape receptors and landscape effects should be combined to arrive at significance and to explain how the conclusions have been derived*".

53. GLVIA3[11] also states that the assessment of significance is "*an evidence-based process combined with professional judgement*" (paragraph 3.23). Professional judgement is, as acknowledged in GLVIA3, a very important aspect of LVIA, and it is important to remember that "*even with qualified and experienced professionals there can be differences in the judgements made. This may result from using different approaches or different criteria, or from a variation in judgements based on the same approach and criteria*" (GLVIA3 paragraph 2.25).

54. In OPEN's methodology, a significant effect occurs where the Development will provide a defining influence on a landscape element, landscape character receptor or view. A not significant effect occurs where the effect of the Development is not material, and the baseline characteristics of the landscape element, landscape character receptor, view or visual receptor continue to provide the definitive influence. In this instance, the Development may have an influence, but this influence will not be definitive. Significant cumulative landscape and visual effects arise where the addition of the Development to other windfarms leads to windfarms becoming a prevailing landscape and visual characteristic.

55. It is important to remember that the assessment of significance in LVIA terms, as required by The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 and set out in GLVIA3, does not provide any indication of the 'acceptability' of the Development, and that the occurrence of significant effects does not in any way imply that a Development would be 'unacceptable'. As stated in GLVIA3[11] (page 153), the LVIA text should "*be impartial and dispassionate, presenting information and reasoning accurately and in a balanced way, and making clear where statements are based on the author's judgement."*

56. It is widely acknowledged that commercial-scale windfarm development will almost inevitably give rise to effects that are assessed as being significant in EIA terms, and this does not render this type of development unacceptable. Planning Policy Statement 18[22] acknowledges the nature of landscape and visual effects of windfarms (paragraph 4.14), stating that "*of all renewable technologies, wind turbines are likely to have the greatest visual and landscape effects*" and that "*the Department recognises that the impact of turbines on the landscape will vary according to the size and number of turbines and the type of landscape involved, and that some of these impacts may be temporary if conditions are attached to planning permissions which require the future decommissioning of turbines*."

5.2.6.4 Nature of Effects

57. The 'nature of effects' relates to whether the effects of the Development are positive, neutral or negative. Guidance provided in GLVIA3[11] states that "*thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity*", but does not

[22] Department of the Environment (August 2009) Planning Policy Statement 18: Renewable Energy

provide an indication as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and reasoned professional opinion.

58. In relation to many forms of Development, the ES will identify positive or negative effects under the term nature of effect. The landscape and visual effects of windfarms are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which these effects can be measured as being categorically beneficial or adverse. For example, in disciplines such as noise or ecology it is possible to identify the nature of the effect of a windfarm by objectively quantifying its effect and assessing the nature of that effect in prescriptive terms. However, this is not the case with landscape and visual effects, where the approach combines quantitative and qualitative assessment.

59. OPEN will define positive, neutral and negative effects as follows:

- Positive effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The removal of undesirable existing elements or characteristics can also be positive, as can their replacement with more appropriate components;
- Neutral effects occur where the Development neither contributes to nor detracts from the landscape and visual resource and is accommodated with neither positive nor negative effects, or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation; and
- Negative effects are those that detract from or weaken the landscape and visual resource through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.

60. OPEN generally adopts a precautionary approach which assumes that significant landscape and visual effects will be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations.

5.2.7 Duration and Reversibility of Effects

61. The effects of the Development are of variable duration and are assessed as short-term/long-term and permanent/ reversible. It is anticipated that the Development will remain on site 'in perpetuity'. The turbines, meteorological masts, site access tracks, substation and battery storage unit will be apparent during this time, and these effects are considered to be long-term.

62. Other infrastructure and operations such as the construction processes and plant (including tall cranes for turbine erection) and construction compounds will be apparent only during the initial construction period of the Development and are considered to be short-term effects.

63. The reversibility of effects is variable. The most apparent effects on the landscape and visual resource, which arise from the presence of the turbines, are reversible as the turbines can be removed, as can the substation and permanent meteorological masts. The effects of the tall cranes and heavy machinery used during the construction and decommissioning periods are also reversible.

64. The access tracks for the Operational Corkey Windfarm will be reused as far as possible, or will otherwise be regraded and reinstated with local vegetation. Turbine foundations and underground cabling will be left in-situ below ground with no residual landscape and visual effects.

5.3 Baseline

5.3.1 Site

65. The Site comprises the rounded hill top of Slievenahanaghan which rises to a high point of 418 m AOD. The site is characterised by the presence of the Operational Corkey Windfarm which comprises 10 turbines, each with a blade tip height of 57 m. The operational wind turbines and existing infrastructure associated with the Operational Corkey Windfarm will form part of the baseline conditions considered in the assessment.

66. The landscape is characterised by moorland and heathland, while the lower sections of the western slopes consist of improved agricultural grasslands. The operational turbines and infrastructure associated with the Operational Corkey Windfarm form part of the baseline conditions considered in the assessment.

67. Alongside the generation of renewable energy, hill sheep farming is the principle land use and the lower slopes comprise improved pasture. Other developments on the hill include a mast to the south-west, an agricultural scale wind turbine to the north-west and farmsteads on the lower slopes, accessed from Reservoir Road.

5.3.2 Site Context

68. The Development is located on the western periphery of the Antrim Hills with the low-lying valley of the River Main situated to the west and the broader range of the Antrim Hills to the east. The predominant orientation of the uplands and the valley is north-south with ridgelines and roads generally following this alignment.

69. The valley landscape to the west is characterised by arable farmland, laid out in enclosed fields with a fine network of rural roads as well as dispersed farmsteads, dwellings and settlements integrated within the rural landscape. The valley landscape is gently undulating with the broader landform comprising western and eastern valley sides falling in towards the River Main which runs south to north through the trough of the valley. Tributary water courses follow the valley form to feed into the River Main. The western valley side is formed by the eastern flank of the Long Mountains which also follow the south to north orientation.

70. The historical land ownership pattern of this area is based on the land being divided into small plots. This has led to a dispersed settlement pattern, whereby individual dwellings occur frequently across the landscape, accessed by the network of rural roads. Larger consolidated settlements also exist, such as Clough Mills at 6 km from the Development, Dunloy at 9 km and Ballymoney at 15 km, but these larger settlements are infrequent and it is more typical for small clusters of dwellings to occur. The main road through the valley is the A26 which connects the M2/M22 north of Antrim in the south with Coleraine in the north.

71. Domestic scale wind turbines are a frequent feature in the valley landscape, often associated with farmsteads or domestic dwellings. Larger commercial wind farms are also a feature, albeit typically seen set on the enclosing ridgelines of the upland areas to the west and east. The ridgelines largely define the view-sheds of the lowland and upland valleys and the main draw of views is typically east-west across the valleys, and then, north-south through the valleys.

72. The upland landscape to the east of the site presents a marked contrast to the valley landscape. Whilst dispersed development continues along the Altnahinch and Old Cushendun Roads, there is very little residential development in the upland hills. The land use pattern changes from a predominance of arable farmland to a predominance of commercial forestry and open moorland. The forestry encloses large parts of this landscape such that there is little intervisibility or association between one area and the next. It is only from the elevated open moorlands that expansive views of the wider landscape can be experienced.

73. As well as the Operational Corkey Windfarm, there are two other operational windfarms on this western edge of the Antrim Hills: Gruig Windfarm to the immediate south and Altaveedan Windfarm to the north. Collectively, these windfarms establish this type of development as part of the baseline character. A cluster of three windfarms occur between 10 and 15 km on Long Mountain to the south-east, comprising Garves, Glenbuck and Long Mountain, and another cluster of two windfarms occur to the south, comprising Rathsherry and Elginny Hill. Also, within the lower lying areas there are numerous moderately large single turbines and other smaller turbines often associated with farmsteads, industry or domestic dwellings.

5.3.3 Landscape Character

74. Policy RG11 of the Regional Development Strategy[23] notes the importance of landscape character in planning:

75. "*Landscape character is what makes an area unique. It is defined as "a distinct, recognisable and consistent pattern of elements, be it natural (soil, landform) and/or human (for example settlement and development) in the landscape that makes one landscape different from another, rather than better or worse". We can only make informed and responsible decisions on the management and planning of sustainable future landscapes if we pay proper regard to their existing character. By understanding how places differ we can ensure that future development is well situated, sensitive to its location, and contributes to environmental, social and economic objectives. The Northern Ireland Landscape Character Assessment 2000 provides valuable guidance on local landscape character and scenic quality."*

[23] Department for Regional Development (March 2012) Regional Development Strategy 2035

76. All the NI landscape was classified and published in a document, The Northern Ireland Landscape Character Assessment (NILCA) 2000[24].

77. Landscape character information is based on the landscape character areas (LCAs) that are described in the Supplementary Planning Guidance (SPG) document entitled 'Wind Energy Development in Northern Ireland's Landscapes'[25]. This 2010 report in turn draws from the LCAs that were originally identified in 'NILCA'. The NI landscape was subdivided into 130 different landscape character areas, each with a distinctive character. Causeway Coast and Glens Borough Council comprises 24 Landscape Character Areas (LCAs), some of these are shared with neighbouring districts. The NILCA also identifies Areas of Scenic Quality. They represent a second tier (below AONBs) in the hierarchy of landscape classifications.

78. The LCAs that cover the study area shown in relation to the ZTV in **Figure 5.2** of Appendix B. The landscape of the area is characterised by north to south running swathes of broadly similar landscapes following the pattern of the landform and valley structure. There are some pockets of differing character and a transition into different areas as one moves from north to south through changes in elevation.

79. The immediate landscape setting of the Development and the wider area to the north and east is covered by the Moyle Moorlands and Forest LCA which is a north to south running area that runs from the coast in the north to the Central Ballymena Glens the in the south. This is an upland landscape with rounded hills rising to approximately 550 m AOD and landcover mix of moorland and forestry.

80. The Key Landscape and Visual Characteristics and Values are identified in the SPG[25]. In relation to windfarm development the document advises that the overall sensitivity is "high to medium" and provides the following advice:

81. "*The scale and landform of at least parts of this LCA are in theory well suited to wind energy developments in landscape and visual terms*." The guidance refers to the plateau landscapes of the central part of the LCA as being less sensitive than the more distinct hill tops where the Operational Corkey Windfarm is located. While the presence of operational developments in this part of the LCA is acknowledged, the sensitivities relating to this location are highlighted. In relation to the location, siting, layout and design considerations the following information is provided:

82. "*Particular care needs to be taken to avoid significant impacts on key views from either the lowland landscapes to the west or from adjacent glens to the north, east and south and on the wild character of the area*." Operational Corkey Windfarm already has an influence on the character if the landscapes to the west, while visibility over the adjacent glen is limited.

83. At the time of assessment there was one operational wind farm in this LCA, at Operational Corkey Windfarm (10 turbines of 57 m) and a further consented site (Gruig 10 turbines of 100 m) which together will form a cluster. Careful consideration will need to be given to cumulative impacts and separation distances from existing developments."

84. To the west of the Moyle Moorlands and Forest LCA lies the Cullybackey and Clough Mills Drumlins LCA and the Long Mountain LCA to the west of that. The Cullybackey and Clough Mills Drumlins LCA is characterised by the general fall of the western and eastern valley sides towards the valley of the River Main, which flows south to north. Landcover is agricultural with a predominance of fields of pasture and substantial pattern of hedgerow and stone wall enclosure. In terms of overall sensitivity this is rated as medium to high, in respect of which the SPG[25] makes the following statement:

85. "*For much of this landscape views are inward-looking and short, interrupted by topography and vegetation. This reduces the sensitivity of this landscape to wind energy development. However, the variation in topography over the short distances and the small scale of the drumlins (which are often just 20m height) and the complex landform mean that this landscape could easily be overwhelmed by poorly sited or inappropriately scaled wind energy development especially since there is already wind energy development in adjoining LCAs to east and west*."

[24] Department of Agriculture, Environment and Rural Affairs (2000) The Northern Ireland Landscape Character Assessment. Available online at: https://www.daera-ni.gov.uk/articles/landscape-character-northern-ireland [Accessed on 11/07/2017]

[25] Northern Ireland Environment Agency (2010) Wind Energy Development in Northern Ireland's Landscapes. Available online at: https://www.planningni.gov.uk/index/news/news_policy/pps18-supplementary-guidance16032009.pdf [Accessed on 11/07/2017]

5.3.4 Landscape Designations

86. The site does not lie within any landscape planning designations. The Landscape Designations which occur in the study area include Areas of Outstanding Natural Beauty (AONBs) and Registered Gardens. These are shown in **Figure 5.3** of Appendix B and described below.

5.3.4.1 Areas of Outstanding Natural Beauty

87. The eastern part of the study area is covered by the Antrim Coast and Glens AONB. It covers an extensive area encompassing much of the north-east coast of Northern Ireland and extending inland across the Antrim Hills and Glens. The western boundary broadly follows the western most ridgeline of the Antrim Hills, albeit omitting the hill summit of Slievenahanaghan, where the Operational Corkey Windfarm is located.

88. The Development lies close to the western boundary of the Antrim Coast and Glens AONB, and this designation also covers the immediate landscape setting (up to 2 km from the nearest turbine), the local landscape setting (between 2 km and 5 km from the nearest turbine), parts of the landscape setting (between 5 km and 15 km from the nearest turbine), and very limited parts of the broad landscape context (between 15 km and 30 km from the nearest turbine) to the east and north-east of the Development.

89. The AONB designation aims to protect and enhance the landscape quality of the area as well as to promote enjoyment of the landscape by the public. Whilst views from these locations will be of heightened sensitivity, windfarm development has not been prohibited from occurring within AONBs in Northern Ireland. In respect of the Antrim Coast and Glens AONB, the operational and consented windfarms all sit on or close to the AONB boundary.

90. AONBs are designated by the Department of the Environment for Northern Ireland (DoENI) and are of national importance. The policy context for AONBs is described in 'Planning Policy Statement 2 Natural Heritage'[26], which states that AONBs are designated "*primarily for their high landscape quality, wildlife importance and rich cultural and architectural heritage*." Policy NH 6 is specifically worded for AONBs, and states that:

"*Planning permission for new development within an Area of Outstanding Natural Beauty will only be granted where it is of an appropriate design, size and scale for the locality and all the following criteria are met:*

a) the siting and scale of the proposal is sympathetic to the special character of the Area of Outstanding Natural Beauty in general and of the particular locality; and

b) it respects or conserves features (including buildings and other man-made features) of importance to the character, appearance or heritage of the landscape; and

c) the proposal respects:

- *local architectural styles and patterns;*
- *traditional boundary details, by retaining features such as hedges, walls, trees and gates;*
- *and local materials, design and colour*."

91. Explanatory text for this policy goes on to say the following:

"*This policy requires development proposals in Areas of Outstanding Natural Beauty (AONB) to be sensitive to the distinctive special character of the area and the quality of their landscape, heritage and wildlife.*

The quality, character and heritage value of the landscape of an AONB lies in their tranquillity, cultural associations, distinctiveness, conservation interest, visual appeal and amenity value."

[26] Department of the Environment Northern Ireland (2013) Planning Policy Statement 2 Natural Heritage. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements/pps2.htm [Accessed on 06/07/2017]

92. In assessing proposals, account will be taken of the Landscape Character Assessments and any other published guidance such as countryside assessments produced as part of the development plan process as well as AONB Management Plans and local design guides.

93. It should be noted that the Development does not lie within an AONB and therefore will only affect the character through its visibility from within the AONBs. **Figure 5.5** of Appendix B illustrates that much of the area that is shown to have theoretical visibility of the Development currently has visibility of the Operational Corkey Windfarm. Despite the Development being located close to the AONB boundary, visibility of the turbines across the wider AONB areas is restricted by the ridge of hills on which the Operational Corkey Windfarm is located and a higher ridge of hills to the immediate east. In views from the AONB operational windfarms are already visible to the immediate and more distant west, while there are no windfarm developments to the east.

5.3.4.2 Areas of High Scenic Value (AoHSV)

94. Areas of High Scenic Value are a local scenic designation, protected through policies contained in the relevant Local Plans. There is one AoHSV in the 30 km study area, located towards the south, at a distance of 22.5 km or more, shown to have no ZTV apart from low levels of visibility which occur beyond the 30 km radius.

5.3.4.3 Registered Gardens

95. The effects on visual amenity from publicly accessible Registered Gardens contained in the Register of Parks, Gardens and Demesnes of Special Historic Interest will be considered within the LVIA. The effects on the Registered Properties as a cultural heritage asset will be assessed in the Cultural Heritage Chapter of the ES.

96. There are three Registered Gardens within 15 km of the Development and a further 32 in the 15-30 km range. The closest Register Garden to the Development is Lissanoure at 3.6 km to the north-west. Of the Registered Gardens and Supplementary Sites lying within a 15 km range, only Lissanoure has some public access reported in the Register.

5.3.5 Principal Visual Receptors

97. A number of visual receptors such as settlements and travel routes will be considered in the assessment as views from them may be affected by the Development. It is not possible to consider every potential visual receptor in the study area due to the extent of ground that it covers; therefore, the assessment concentrates on the 'principal' visual receptors that may gain visibility of the Development. Principal visual receptors are shown in relation to the ZTV on **Figure 5.4** of Appendix B.

5.3.5.1 Settlements

98. The settlements considered in this assessment are drawn from the Settlement Development Limits (SDLs) dataset as provided by the Northern Ireland Statistics and Research Agency (NISRA). SDLs are a statistical classification and delineation of settlements in Northern Ireland as defined by the Planning Service. SDL boundaries are available for settlements with a population of greater than 1,000; therefore, the settlements included in this assessment are those that have a population of over 1,000 people.

5.3.5.2 Routes

99. Routes include roads, railway lines, national walking routes and national cycle routes. Routes included as principal visual receptors in the assessment are determined by four criteria:

- The proximity of the route to the Development;
- The extent to which the route traverses the study area or extends across a notable part of it;
- The importance of the route in terms of recognition, volume of users and usage; and
- The potential for the Development to contribute to cumulative effects along the route.

5.3.5.3 Viewpoints

100. **Table 5.2** presents the initial list of potential viewpoints. These have been identified through reference to the ZTV with viewpoints shown in **Figure 5.4** of Appendix B and have been agreed with the Council during pre-application discussions. In selecting viewpoints, a range of receptor types and distances has been sought. Those viewpoints marked with an asterisk are those considered to be most important in relation to the design of the windfarm layout, since most represent static and/or close-range receptors.

Table 5.2: Representative Viewpoints

No.	Viewpoint	Grid Reference	Distance (km)	Representative
1*	Drumrankin	305296/413276	0.46	Representative of residents, pedestrians and road-users.
2*	Lislaban	308192/419473	3.62	Representative of residents, pedestrians and road-users.
3*	Reservoir Road	310267/422958	4.59	Representative of residents and road-users.
4*	Loughgiel	307614/424781	3.73	Representative of residents, pedestrians and road-users.
5*	Altnahinch Road south	315035/421400	2.11	Representative of road-users.
6*	Altnahinch Reservoir	311949/423164	14.01	Representative of recreational-users.
7*	Slieveanorra	313455/426627	3.70	Representative of recreational users.
8	Ballycregagh Road, Clough Mills	307075/417122	1.10	Representative of residents, pedestrians and road-users.
9	B94 over A26 west of Clough Mills	305097/418581	10.22	Representative of residents, pedestrians and road-users.
10	Tullaghans Road, Dunloy	301061/418392	3.55	Representative of residents, pedestrians and road-users.
11*	Ballymeany	307065/422230	6.05	Representative of residents, pedestrians and road-users.
12	Altnahinch Road north	310339/425017	6.60	Representative of residents and road-users.
13	Cemetery near Glarryford	303935/416243	10.07	Representative of residents, pedestrians and visitors.
14	Kildoan Hill	305433/421182	8.89	Representative of residents and road-users.
15	Slemish	322125/405719	5.42	Representative of recreational-users.
16	A26 layby	306590/412832	12.18	Representative of road-users.
17	Ballymoney	296921/425301	19.20	Representative of residents, pedestrians and road-users.
18	Boghill, Long Mountain	300616/415216	9.92	Representative of residents, pedestrians and road-users.

5.3.6 Cumulative Windfarms

101. The cumulative context comprises other commercial windfarms of various scales, as well as single turbines. The windfarms are shown on **Figure 5.6** of Appendix B with single turbines mapped where they lie within a 5 km radius of the Development. Gruig Windfarm lies on the same hill ridge as the Operational Corkey Windfarm and the Development, abutting the site to the immediate south. The relationship between these two developments will be an important factor in the assessment of cumulative effects. Operational Altaveedan Windfarm lies 4 km to the north, also on the western edge of the Antrim Hills. On Long Mountain Ridge that runs parallel to the Antrim Hills, on the opposite side of Main Valley, there occurs a cluster of three operational windfarms all at a range of 11 to 13 km. These have potential to contribute to cumulative effects experienced in the intermediate valley. At a range of 10 to 13 km to the south of the Operational Corkey Windfarm, there are two consented windfarms; Rathsherry and Elginny Hill.

5.4 Key Sensitivities

5.4.1 Landscape Sensitivities

102. The main landscape effects will arise through the direct alteration of the landscape pattern or features, e.g. through the addition or removal of these. Beyond this, landscape character effects will only arise through visibility of these changes as part of the wider context.

103. The most sensitive areas of the landscape within the study area are the scenic areas or landscapes recognised for their value through designation, particularly those areas which have very little development, wildness characteristics, and landscapes with small scale features which can result in detrimental scale comparisons with large turbines. Proximity to the Development and its actual visibility in key views will also determine sensitivity to the changes proposed.

104. The landscape character assessment will focus on areas within a 15 km radius, as significant effects on landscape character are unlikely to occur beyond this range. This is due to the landscape character of the study area and the fact that there is an Operational Windfarm on the site which is already visible from large parts of the landscape (**Figure 5.5** of Appendix B). This is part of the baseline character of the Site, and views towards it from other landscape character areas are extant.

5.4.2 Visual Sensitivities

105. The most sensitive visual receptors are those where the occupation of the viewers means that they will have regular and sustained visibility of the Development. Whether the views are valued, through a landscape planning designation, also has a bearing on their sensitivity to change. The degree to which people moving through the landscape are doing so with the purpose of enjoying the views, as well as their speed of travel, are also factors that affect sensitivity with the slowest moving receptors (walkers) being the most sensitive.

106. All of the viewpoints will have figures prepared for them. It is considered that viewpoints and visual receptors beyond the 20 km range would not be significantly affected by the Development, as such viewpoints beyond 20 km have been scoped out of the assessment.

5.4.3 Cumulative Sensitivities

107. There are numerous operational, under construction and consented windfarms as well as single turbines within a 15 km radius of the Development. Whilst the Operational Corkey Windfarm contributes to the cumulative windfarm effect within the area, its comparatively small-scale turbines mean that relative to other, larger windfarms its contribution to cumulative effects is limited and that it appears small in scale in comparison to the adjacent Gruig Windfarm. The use of larger turbines on the western edge of the Antrim Hills and in close proximity to large numbers of visual receptors, will increase its contribution to the cumulative effect. The cumulative effect of adding the repowered Development to scenarios with the other operational, consented and application windfarms will be assessed.

108. The Operational Corkey Windfarm turbines are currently notably smaller than the other windfarms that are operational or consented within the local area. This divergence of scales is apparent and the smaller turbines appear incongruous. The schemes that have been submitted as applications are also larger in scale and will be considered within the cumulative assessment.

5.5 Scoped In Effects

109. The assessment of key sensitivities presented in **Section 5.3.2** has highlighted those landscape and visual receptors that have potential to undergo significant effects and, therefore, are required to be fully assessed in the LVIA. **Table 5.3** sets out the landscape and visual receptors that it is proposed are scoped in to the LVIA. The assessment process and further evidence may identify that some of these landscape and visual receptors can be scoped out, in which case agreement would be sought on the updated list of receptors to be assessed.

Table 5.3: Receptors to be Scoped into the LVIA

Receptor	Approximate distance to nearest turbine (km)	Subject to ZTV- theoretical visibility?	Need to assess effects further within LVIA?
Landscape character areas			
Dervock Farmlands	6.46	Yes	Yes
Long Mountain Ridge	8.13	Yes	Yes
Cullybackey and Clough Mills Drumlins	1.72	Yes	Yes
Central Ballymena Glens	1.90	Yes	Yes
Moyle Moorlands and Forest	0.00	Yes	Yes
Moyle Glens	7.93	Yes	Yes
Garron Plateau	6.68	Yes	Yes
Landscape planning designations			
Antrim Coast and Glens AONB	0	Yes	Yes
Lissanoure GDL	3.6	Yes	Yes, although house and gardens are private, the lake is publicly accessible.
Principal visual receptors			
Cloughmills	5.22	Yes	Yes - although actual visibility limited to the more elevated and open parts such as the southern and eastern edges.
Dunloy	9.01	Yes	Yes - this settlement traverses the hill ridge opposite the Antrim Hills with views carrying across the intermediate valley.
Ballymoney	14.35	Yes	Yes- views from south-western edge of town may give rise to significant effects. Views from other parts of settlement unlikely to give rise to significant effects due to intervening urban screening and influences.
A26 (north of Ballymena to Ballymoney)	6.4	Yes	Yes - while the ZTV shows patchy visibility there are enough views towards the site to make it a readily visible feature from parts of this route.
B93 (A26 junction to Armoy)	5.9	Yes	Yes - ZTV shows continuous visibility along this section although actual visibility will be reduced by enclosure of vegetation.
B16 (Garryford to Ballymoney)	8.8	Yes	Yes - the B16 is set along the elevated hill side and affords clear views across the Main valley to the Antrim Hills where the Development will be located.
B94 (Clough to A26)	6.1	Yes	Yes - while the southern section is too oblique for clear views to the site to occur, the northern section is closer range and more open views will occur.

Receptor	Approximate distance to nearest turbine (km)	Subject to ZTV- theoretical visibility?	Need to assess effects further within LVIA?
Belfast to Londonderry Railway (Ballymena to Ballymoney)	7.6	Yes	Yes - the rail line runs parallel to the A26 but on the more elevated slopes close to the B16 and in sections open views across to the Antrim Hills are experienced.
The Moyle Way (part of the Ulster Way) Long Distance Route	3.9	Yes	Yes - despite the limited extent of ZTV, the close range of this route makes it susceptible to the effects of the Development.

5.6 Scoped Out Effects

110. The assessment of key sensitivities presented in **Section 5.3.2** has indicated those landscape and visual receptors that do not have potential to undergo significant effects; therefore, these are not required to be further assessed in the LVIA. Should further evidence and assessment support scoping out further areas, then we may seek to agree this at a future date. **Table 5.4** sets out the landscape and visual receptors that are scoped out of the LVIA.

Table 5.4: Receptors to be Scoped out of the LVIA

Receptor	Reason for being scoped out
Landscape Character Areas beyond 15 km radius	Due to the distance to the Development and the landscape character of the study area. In particular, the fact that there is an operational windfarm on the site, which is part of the baseline character and views towards it from other landscape character areas. Other operational and under construction windfarms also often occur within a similar part of long range views.
Lower Bann Valley	ZTV shown to be patchy across far western side of LCA at a range beyond 14.8 km. LCA occurs in south-west of study area with no clear association with the Site.
Coleraine Farmland	ZTV shown across much of this LCA at a range of 14.9 km or more. Closest part of this LCA lies to the west of Ballymoney, which will form close range and intervening feature between LCA and the Site, which in turn makes a limited contribution to the character of this LCA.
Garry Bog	ZTV shown across much of this LCA at a range of 14.9 km or more. This is a small LCA with an enclosed, introverted character, and limited association with the Site.
Ballymena Farmland	ZTV shown to be patchy across parts of this LCA at a range of 11.6 km or more. This LCA comprises farmland wrapping around the north, east and southern sides of Ballymena. The main influences on landscape character come from the urban areas and enclosed farmland with no apparent association with the Site.
Landscape Planning Designations	
Causeway Coast AONB	Limited extent of ZTV at ranges beyond 18 km. Character of landscape is derived from its coastal location and views out over the sea. Development may be visible from elevated areas; however, such areas will be influenced by numerous other elements within the wider context - including urban areas and trees.
Areas of High Scenic Value River Bann area	Distances of greater than 20 km. Very limited visibility on ZTV at a range beyond 30 km.
Registered Gardens and Supplementary Sites beyond 15 km radius	Due to the distance to the Development and the landscape character of the intervening parts of study area. In particular, the fact that there is an operational windfarm on the site, which is part of the baseline character and views towards it. Other operational and under construction windfarms also often occur within a similar part of long range views.
Gardenvale	Private house and garden, not open to public. Limited extent of ZTV at 12.6 km.
Cleggan Lodge	Private house and garden, not open to public. Limited extent of ZTV at 14.7 km.

Receptor	Reason for being scoped out
Principal Visual Receptors	
Settlements beyond 20 km range	Distance to Development. Operational and under construction windfarms in similar part of views. Foreground screening and influence of a range of urban and landscape features within the intervening area.
Cushendall	Not in ZTV.
Broughshane	Not in ZTV.
Ballymena	This settlement lies 15.87 km from the Development. ZTV shown to be patchy especially across northern part of settlement where more open aspect to the north occurs.
Cullybackey	This settlement lies 15.90 km from the Development. ZTV shown to be very limited with small patches around fringes.
Ballycastle	Not in ZTV.
Carnlough	Not in ZTV.
Kilrea	This settlement lies 19.71 km from the Development. ZTV shown to comprise small patch of low level visibility.
Rail and road routes beyond 10 km	Distance to Development. Transient rather than static nature of viewers. Operational windfarms in similar part of views. Foreground screening and influence of a range of urban and landscape features within the intervening area.
B64	In respect of the section within the 10 km radius, ZTV shown to be patchy across eastern half. Although more continuous across western half, enclosure by vegetation and intervening landform will reduce potential for significant effects to arise.
A43	Limited extent lies within ZTV to south of Development where intervening foothills and enclosed farmland will reduce actual visibility.
B14	Not in ZTV.
B16	In respect of the section within the 10 km radius, ZTV shown to be mostly continuous although enclosure by vegetation and intervening landform will reduce potential for significant effects to arise.
National Cycle Routes	Distance to Development. Transient rather than static nature of viewers. Operational windfarms in similar part of views. Foreground screening and influence of a range of urban and landscape features within the intervening area.
Antrim Hills Way	This route lies beyond 17 km to the south from the Development and shown with small patches in ZTV.
Dungonnell Way	Not in ZTV.
The Croaghan Way	This route lies beyond 7 km to the north from the Development and shown with very small section in ZTV.

5.7 Key Questions for the Council / Consultees

111. Key questions for the Council and Consultees are:

- Do Consultees agree with the proposed study areas for the LVIA and cumulative LVIA?
- Do Consultees agree with the aspects proposed to be scoped out of the LVIA?
- Do Consultees agree with the proposed viewpoint locations?
- Do Consultees agree with the proposed format for the visualisations?
- Do Consultees require any further information in order to inform your responses on the above?
- Would Consultees be happy with a cut off for the consideration of cumulative wind farm change that is 3 months from the proposed submission date, in order for the assessment to be carried out on an agreed cumulative windfarm context?

6 Ecology

6.1 Introduction

1. The aim of the Ecological Impact Assessment (EcIA) is to identify, quantify and evaluate the effects of the Development on ecosystems and their components, including designated sites, habitats, flora and fauna. This section will address all terrestrial and freshwater ecological receptors with the exception of birds, which will be assessed in **Section 7: Ornithology**.

2. The Ecology assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case than the decommissioning of the repowered wind turbines alone, should it be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

6.2 Suggested Methodology

4. The assessment of ecological effects will follow the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance[27] ensuring a transparent and robust approach to EcIA. These guidelines set out the process for assessment through the following:

- Collation of baseline ecological information through desk study and field surveys;
- Identification of Important Ecological Features (IEFs) including designated sites, protected / priority species and habitats;
- Identification and characterisation of effects on IEFs including positive or negative, extent, magnitude, duration, timing, frequency and reversibility;
- Assessment of cumulative effects;
- Proposals for design and mitigation measures to avoid and / or minimise effects on IEFs;
- An assessment of residual effects following the implementation of design and mitigation measures; and,
- Identification of appropriate compensation measures to offset significant residual effects and opportunities for ecological enhancement.

6.2.1 Desk Study

5. Data and information from the following sources will be reviewed:

- Plans and specifications for the Development;
- Designated sites within a 15 kilometre (km) radius of the centre of the Site (see **Figures 6.1 and 6.2** of Appendix B), obtained from the websites of the Northern Ireland Environment Agency and Joint Nature Conservation Committee;
- Records of flora and fauna within 5 k m of the centre of the Site, obtained from the Centre for Environmental Data and Recording and the National Biodiversity Atlas; and
- Records of bat roosts and activity within 5 km of the centre of the Site, obtained from the Northern Ireland Bat Group.

6.2.2 Field Surveys

6. A series of walkover surveys have been carried out between April and June 2017, and will continue until October. Habitat surveys have been carried out using the methods and classification system of the Handbook for Phase 1 habitat survey[28]. Where possible, peatland habitats and any other Northern Ireland Priority Habitats have been classified using the National Vegetation Classification (NVC)[29] system.

[27] CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. (2nd edition)
[28] Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit.
[29] Rodwell, J.S. (ed.) 1991. British Plant Communities. Volume 2. Mires and heath.

7. Surveys for protected / priority fauna have been undertaken during the walkover surveys, and the suitability of the habitat for other protected / priority fauna has been assessed. Particularly attention has been paid to the following species:

- All bat species;
- Badger (*Meles meles);*
- Otter (*Lutra lutra);*
- Red squirrels (*Sciurus vulgaris);*
- Smooth newt (*Triturus vulgaris);*
- Common lizard (*Zootoca vivipara);* and
- Marsh Fritillary butterfly (*Euphydryas aurinia).*

6.2.3 Active Peat Assessments

8. In recognition of the high importance afforded to active peatland in the Department of the Environment's 'Planning Policy Statement 18: Renewable Energy' (2012) and the 'Strategic Planning Policy Statement for Northern Ireland: Planning for Sustainable Development' (2015, under review), additional assessments will be undertaken for any habitats that may qualify as 'active peat'. It is acknowledged that the classification of active peat habitats can be quite complex, particularly in disturbed habitats and around the margins of peatland bodies, so a bespoke classification system has been developed for this Development, in order to provide a systematic and transparent approach. The first step will involve classifying habitats into three categories, as follows:

- Active peat: these areas support the NVC M19 community, have a peat depth of >0.5 metre (m), and has an existing hydrological regime that supports peat formation;
- Possibly active peat: these areas support modified blanket bog (including drained / oxidised areas on deep peat), wet heath or heath-mire transition habitat, have peat layers >0.5 m; and
- Not active peat: these areas do not support heath or bog vegetation, have a peat depth of <0.5 m, and/or a highly-modified hydrological regime.

9. Further assessments and fine-scale mapping will be undertaken within the 'active peat' and 'possibly active peat' zones, based on the presence of indicator plant species, the depth of the underlying peat layer, and the hydrological condition of the peatland unit (measured using dipwells). This approach was discussed with a representative of the NIEA Natural Environment Division during a meeting held on the 31st of May 2017. Further details of the approach to peat surveys is outlined in **Section 11.3: Geology, Soils and Peat**.

6.2.4 Bats

10. Reference has been made to the 3rd edition of the Bat Conservation Trust (BCT) guidelines[30] in determining the approach to bat surveys. It is noted that Chapter 10 regarding assessments of windfarm developments of the 3nd edition BCT guidelines is still to be published and therefore all surveys for the coming season will be carried out in accordance with the 2nd edition [31] guidelines.

11. The Site is located in open, upland moorland, and there are no linear habitat features or potential roost features within 1 km and, as such, it is considered to have low suitability for bats. Based on the survey effort for a low-risk site in Table 10.2 of the BCT 2nd edition guidelines, automated detector surveys will be undertaken for at least five nights during each of the three survey seasons (spring, summer and autumn), plus a transect walk using a hand-held detector in each season. To ensure that there will be sufficient data to assess potential operational effects on bats throughout the year, the Applicant has committed to undertaking at least ten nights of surveys in each season, and this could be increased if higher levels of bat activity are recorded than expected.

12. Six static detectors will be placed at ground level, and a seventh will be placed at a height of approximately 50 m on the meteorological mast (installed in July 2017). For the first set of surveys in spring 2017 the bat detectors were placed in a range of different habitat types throughout the Site. These locations will be adjusted in subsequent survey periods once the Development layout has been determined. This approach was discussed with a representative of the NIEA Natural Environment Division during a meeting held on the 31st of May 2017.

[30] Collins, J. (ed.) (2016). *Bat Surveys For Professional Ecologists: Good Practice Guidelines* (3rd edition)
[31] Hundt, L. (ed.) (2012). *Bat Surveys: Good Practice Guidelines document.* (2nd edition)

6.2.5 Ecological Impact Assessment

13. Based on the information collected during the desktop and walkover surveys, an ecological value will be assigned to each feature based on its conservation status at different geographical scales. For example, a site may be of national ecological value for a given species if it supports a significant proportion (e.g. 5 %) of the total national population of that species. It is accepted that any development will have some negative effects on the receiving environment, but the significance of the effect will depend on the value of the ecological features that would be affected. The following is outlined in the CIEEM guidelines: "*One of the key challenges in an EcIA is to decide which ecological features (habitats, species, ecosystems and their functions/ processes) are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be important and potentially affected by the project. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to effects from the development, and that will remain viable and sustainable*[27]." Therefore, the EcIA will focus only on Important Ecological Features (IEFs) i.e. those that are of local value or higher, or that receive legal protection. Features of negligible ecological value (e.g. species-poor grasslands) are not considered to be material in decision making, so they will be scoped out of the impact assessment.

14. Potential direct, indirect or cumulative effects on ecological features can be described in relation to their magnitude, extent, duration, reversibility and timing/frequency, as outlined in the CIEEM (2016) guidelines. Depending on the type of effect and the sensitivities of the IEF, effects will be determined to be significant or not significant. The following definitions are provided in the CIEEM guidelines: "*A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project*". "*For the purpose of EcIA, a 'significant negative effect' is an effect that undermines biodiversity conservation objectives for 'important ecological features', or for biodiversity in general*." Where significant effects are identified, measures will be taken to avoid, minimise or compensate for such effects. Based on these measures, the impact assessment will be repeated, and any residual effects will be outlined.

6.3 Baseline

6.3.1 Environmental Setting

15. The Operational Corkey Windfarm is situated on the crest of Corkey Hill, to the north-east of Clough Mills in County Antrim. The Site includes the Operational Corkey Windfarm and additional lands on the northern and western slopes of the hill. The landscape is characterised by moorland and heathland, while the lower sections of the western slopes consist of improved agricultural grasslands.

6.3.2 Designated Sites

16. The Site Boundary as shown in **Figure 2.1** of Appendix B is not within or adjacent to any sites that are designated for nature conservation. Details of Natura 2000 sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) within 15 km of the centre of the Site are provided in **Figure 6.1** of Appendix B and **Table 6.1.** Sites of national importance (Areas of Special Scientific Interest (ASSIs) and National Nature Reserves (NNRs)) are presented in **Figure 6.2** of Appendix B and **Table 6.2**. Potential pathways (e.g. hydrological connections) for indirect effects on each designated site are discussed in the tables.

Table 6.2: Designated Sites of European Importance (Natura 2000 sites) within 15 km of the Site

Site name	Distance	Qualifying Interests	Potential pathways for effects
Antrim Hills SPA	0.8 km north-east	**Special Conservation Interests:** • Hen harrier • Merlin	There is potential for the Site to be within the flight range of birds from the SPA (see **Section 7**).
Main Valley Bogs SAC	5.2 km west	**Annex I Habitats:** • Active raised bogs	None
Garran Plateau SAC	8 km south-east	**Annex I Habitats:** • Blanket bogs • Alkaline fens • Oligotrophic standing waters • Natural dystrophic lakes and ponds • Northern Atlantic wet heaths with Erica tetralix • Transition mires and quaking bogs **Annex II Species:** • Marsh saxifrage (*Saxifraga hirculus)*	None
Breen Wood SAC	10 km north	**Annex I Habitats:** • Old sessile oak woodlands • Bog woodland **Annex II Species:** • None	None

Table 6.2: Designated Sites of National Importance (Areas of Special Scientific Interest (ASSIs) and National Nature Reserves – (NNRs)) within 15 km of the Site

Site name	Distance	Reasons for designation	Potential pathways for effects
Slieveanorra and Croaghan ASSI	2.8 km north-east	Blanket bog, montane heath, hen harrier and merlin	There is potential for the Site to be within the flight range of birds from the SPA (see **Section 7**).
Slieveanorra NNR	4.2 km north-east	Peatlands	None
Glarryford ASSI	5.1 km south-west	Glacial deposits including eskers and hummocks	None
Dunloy Bog ASSI	5.2 km south-west	Lowland raised bog	None
Frosses Bog ASSI	6.3 km south-west	Lowland raised bog	None
Caldanagh Bog ASSI	6.6 km west	Lowland raised bog	None
Ballymacaldrack ASSI	8.5 km south-west	Purple moor-grass and rush pastures	None
Craig ASSI	10.5 km west	Purple moor-grass and rush pastures	None
Garron Plateau ASSI	8 km south-east	Blanket bog, fens, dystrophic lakes, oligotrophic lakes, wet heath, dry heath	None
Rathsherry ASSI	9.5 km south	Purple moor-grass and rush pastures	None
Glenballyemon River ASSI	8.1 km east	Upland river and waterfalls	None
Tievebulliagh ASSI	8 km north-east	Tertiary igneous geology	None
Glenariff ASSI, NNR	10.1 km east	Ash woodland and upland rivers with waterfalls	None
Breen Oakwood ASSI, NNR	10.5 km north	Oak woodlands, wet woodlands	None
Capecastle ASSI	13 km north	Geology: cretaceous stratigraphy	None

17. Potential significant effects on the qualifying interests (hen harrier and merlin) of the Antrim Hills SPA and the Slieveanorra and Croaghan ASSI will be addressed in the Ornithology ES Chapter and potential significant effects on water quality in Lough Neagh will be addressed in the Hydrology, Hydrogeology, Geology, Soils and Peat ES Chapter. Potential effects on the designations as a whole will then be considered in accordance with Article 6 of the Habitats Directive.[32]

6.3.3 Survey Results to Date

6.3.3.1 Habitats and Flora

18. A map of habitats within the Site Boundary is provided in **Figure 6.3** of Appendix B. A number of Northern Ireland Priority Habitats were identified within the Site, including blanket bog, upland heathland, purple moor-grass and rush pastures, rivers / streams, and upland flushes, fens and swamps. Particular attention has been paid to habitats that would qualify as 'active peat', as defined in the NIEA advice note[33]. Based on field surveys and assessments to date, an area in the east of the Site has been identified as highly likely to be active peat, with some areas of highly degraded peat in the centre and north of the Site that will require further assessment. All other areas on sloping ground within the Site Boundary have a shallow or negligible peat layer. Further fine-scale active peat assessments will be undertaken in areas that are proposed for development.

19. No protected or priority flora have been recorded in the Site to date.

6.3.3.2 Protected / Priority Fauna

20. Three badger setts have been found within the Site, two of which appear to be main setts and one an annex sett. All appeared to be recently active, and field signs of badgers - including latrines, hairs, prints and tracks - were found at a number of locations in the Site. The location of the setts cannot be made public in this Scoping Request because badgers are vulnerable to persecution, but maps can be provided to key statutory consultees on request.

21. With the exception of Irish hare (*Lepus timidus hibernicus),* which have been observed on the access roads of the Operational Corkey Windfarm and in some grassland areas, no other mammals have been observed during surveys. Similarly, no field signs of any other mammals have been observed to date and therefore it is considered that no other species use the Site on a regular basis.

6.3.3.3 Bats

22. 13 nights of automated bat surveys and one transect survey were carried out from April to May 2017 at six locations around the Site. Negligible bat activity was recorded on 12 of the nights, due primarily to high wind speeds and low night temperatures. On the other two nights Leisler's and/or common pipistrelle bats had Bat Activity Indices (BAIs) of approximately 2 bat passes per hour at a number of locations. This is equivalent to approximately one bat pass every 30 minutes, which is considered to be a negligible level of activity. The species breakdown over six locations and 13 survey nights (a total of 78 survey nights) was as follows:

- 78 common pipistrelles (47 % of all records);
- 67 Leisler's bats (42 %);
- 14 soprano pipistrelles (8 %); and
- 6 unidentified bats (3 %).

23. Surveys will continue for the remainder of the season at the current scope, but the survey period may be extended if higher levels of bat activity are recorded.

6.3.3.4 Reptiles and Amphibians

24. Common frogs were observed in the moorland and heathland habitats, but no common lizards or smooth newts have been recorded within the Site. Small ponds were observed in the peat workings in the east of the Site but due to prolonged periods of dry weather these had dried out in April / May and, as such, are considered unlikely to provide suitable breeding habitat for newts or frogs. On this basis, it is proposed that newt surveys are scoped out of the EcIA.

[32] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended OJ L 43, 1.1.2007, p. 1

[33] NIEA (2012). Advice Note on Active Peatland and PPS18. Available online at: https://www.daera-ni.gov.uk/sites/default/files/publications/doe/natural-guidance-active-peatland-and-pps18-2012.pdf [Accessed on 11/07/2017]

25. Upland bogs and heathland are known to be a preferred habitat for common lizards, and it is possible that some may be present in the Site at low densities. However, considering that the surveyor visited the Site on 12 occasions between March and June (this encompasses a key period of lizard activity), and has covered more than 50 km during walked surveys to date, it is notable that no lizards had been recorded. On this basis, it is expected that, if present, lizards may occupy the Site at very low densities, and therefore would not be likely to suffer significant effects during the decommissioning of the Operational Corkey Windfarm nor during the construction of the Development. Consequently, it is proposed that lizard surveys are scoped out of the EcIA.

6.3.3.5 Terrestrial Invertebrates

26. A search for the larval food plant (devil's-bit scabious (*Succisa pratensis*)) of the marsh fritillary butterfly was undertaken during the habitat surveys with no larval food plants recorded. Therefore, it is proposed that marsh fritillary surveys are scoped out of the EcIA.

6.4 Key Sensitivities

27. Based on the studies undertaken to date, the key ecological sensitivities are considered to be direct effects on peatland habitats, badgers and bats, and indirect effects on designated sites, watercourses and aquatic fauna,

6.4.1 Designated Sites

28. The risk of negative effects on designated sites is considered to be low. However, potential indirect effects on the qualifying interests (hen harrier and merlin) of the Antrim Hills SPA and the Slieveanorra and Croaghan ASSI will be addressed in ES Chapter 7**:** Ornithology, and potential indirect effects on water quality in the Lough Neagh and Lough Beg SPA will be addressed in ES Chapter 11: Hydrology, Hydrogeology, Geology, Soils and Peat. Potential effects on the sites as a whole will then be addressed in the Ecology ES Chapter and the associated Habitats Regulations Assessment.

6.4.2 Peatland Habitats

29. The highest-quality blanket bog habitats exist on the plateau in the southeast of the Site, but most other areas are highly modified, and are unlikely to meet the criteria for active peat. There are also some areas of upland heathland and small-scale upland flush habitats, both of which are Northern Ireland Priority Habitats. In recognition of Policy RE1 of the Department of the Environment's Planning Policy Statement 18: Renewable Energy regarding 'active peat' habitats, and to priority habitats under Policy NH5 of Planning Policy Statement 2: Natural Heritage, the Development will be designed to ensure that negative effects on these habitats are avoided or minimised.

30. The decommissioning of the Operational Corkey Windfarm and the construction of the Development will take place in one phase, and potential effects on habitats will be considered in combination. Where possible, existing roads and hardstanding platforms will be re-used, although it is likely that these features will be required to be re-engineered in order to accommodate larger turbines. The works to the existing infrastructure will result in small-scale effects on adjacent habitats, potentially including some small areas of active peat, although attempts will be made to avoid or minimise such effects. If any development is required in areas of active peatland, fine-scale active peat assessments (e.g. at 5 or 10 m intervals) will be carried out in order to avoid the areas of highest sensitivity. Consideration will also be given to the micro-siting allowance for each turbine, and of the areas that may be unsuitable for development within the allowed radius.

31. In order to compensate for the loss of active peat and priority habitats, a range of potential habitat mitigation and compensation measures are being considered, which may include the restoration of degraded peatland habitats (primarily by drain blocking), modification of the grazing regime, or the cessation of some damaging activities. These measures will be included in an outline Habitat Management Plan for the Development (which will be provided as a technical appendix to the Ecology ES Chapter), and will ensure that there is no net loss of biodiversity.

6.4.3 Badgers

32. The Site appears to be used by at least one group of badgers. Decommissioning and construction works in the vicinity of active setts can cause injury or significant disturbance of badgers, the setts will be avoided during the design of the Development layout. With this exception, the decommissioning of the Operational Corkey Windfarm and construction and operation of the Development is unlikely to cause any other disturbance of badgers.

6.4.4 Bats

33. Based on the results of the spring bat surveys (see **Section 6.3.3.3**) it appears that high wind speeds are likely to reduce the suitability of the Site for foraging / commuting bats for most of the year, although some bats use the site when wind speeds

are low. Common pipistrelles and Leisler's bat were the most frequently recorded species, bat activity indices were typically ≤2 (equivalent to one bat pass every 30 minutes on average) on the two nights on which they were recorded. Bat surveys will continue for the remainder of the summer and autumn periods, using a higher than recommended survey effort in order to ensure that the impact assessment is based on a robust dataset. Activity will be assessed in the context of onsite weather conditions, and will include activity data recorded at height.

6.5 Fisheries

34. The Development is located within the upper reaches of the Killagan Water, a tributary of the River Main. The River Main is an important salmon and trout river and is one of seven Index Rivers utilised by DAERA Inland Fisheries to provide the basis for salmon management throughout Northern Ireland. In terms of salmon spawning stock the River Main has typically been below its conservation limit although the target was exceeded in 2012 and 2014. The River Main is not subject to any designations with regard to aquatic habitats or species.

35. Under the Water Framework Directive (WFD) the Killagan tributary has been assessed as of Moderate Ecological Status in each year since 2010 due to sub-standard benthic inverts and/or fish classification[34].

6.5.1 Stream Quality & Fisheries Potential

36. An outline assessment of the area and streams draining the Site was undertaken in June 2017. Two small streams arise within the Site Boundary, flow in a south-westerly direction and merge just outside the Site Boundary to the west of Corkey Road. Within the Site the streams are very small in size and are on steep slopes, therefore it is highly unlikely that they would support significant populations of fish or other aquatic fauna. As such there would be no direct impact on fisheries within the Site and it is proposed that this element is scoped out of the EcIA.

37. Outside of the Site, towards the western boundary, the southern stream is slightly larger (1 m - 2 m wide) than the northern stream (1 m - 1.5 m) and appears to be of greater fisheries potential in this area. There is some evidence of local degradation in the northern stream immediately downstream of Corkey village, possibly due to run-off from the local sewage treatment works. The merged stream then flows west to the south of Ballyweeney Road – in this reach it appears to be of good quality and is likely to contain brown trout and possibly eels. The bed slope (gradient) subsequently diminishes (1-2km from the Site) and this has an adverse impact on habitat quality. Bed slope and habitat quality improve towards Kilmandil Bridge (4 – 5 km from the Development) with improved fisheries potential over the next 3 – 3.5 km towards Killagan Bridge – trout, eel and occasional salmon are present in this area. This reach was subject to habitat enhancement works in 2006 as part of a European Economic Area (EEA) Salmon Management Project.

38. As part of the Development design approach, it is proposed to re-use the existing infrastructure where possible, this includes reusing or upgrading the existing watercourse crossings serving the Operational Corkey Windfarm as well as maintaining a 50 m buffer of all natural watercourses and a 20 m buffer of large natural drains within the Site during the layout design process. Best practice techniques will be used during the decommissioning and construction phases of the Development to minimise any run off entering the watercourses. This is discussed further in **Section 11.3: Geology, Soils and Peat.**

39. Given the nature of the watercourses within the Site Boundary, the reuse of existing watercourse crossings wherever possible together with the use of best practice decommissioning / construction techniques, the lack of designations and the limited fisheries potential within the tributaries in the immediate vicinity of the Site Boundary, it is unlikely that the Development would have a significant effect on watercourses or fisheries. In addition, there is a very low risk of effects on the Lough Neagh and Lough Beg SPA, because the dilution effect of the 50 km of intervening watercourse would reduce the concentration of most pollutants to negligible levels before they could reach Lough Neagh. Nonetheless, potential indirect effects on watercourses, fisheries and the Lough Beg SPA will initially be scoped in to the EcIA, with a focus on scoping this out following further discussions with the statutory consultees.

6.6 Scoped In Effects

40. Following desk studies, field surveys and consultation undertaken to date, it is proposed that the following elements are scoped in to the EcIA:

[34] NIEA River Basin View. Available online at: http://appsd.daera-ni.gov.uk/RiverBasinViewer/

- Possible direct effects on the qualifying interests of the Antrim Hills SPA (to be addressed by the ornithology ES Chapter)
- Possible indirect effects on fisheries and other aquatic fauna in the Killagan Water, the Maine River and the Lough Neagh / Lough Beg SPA due to surface water runoff from the Development during both the decommissioning ./ construction and operational phases (this may be scoped out following further consultation);
- Direct effects on active peat and Northern Ireland Priority Habitats during decommissioning and construction works;
- Possible direct effects on badger setts during the construction of the Development; and
- Possible direct effects on foraging / commuting bats during the operation of the Development.

6.7 Scoped Out Effects

41. It is proposed that the following elements are scoped out of the EcIA:

- Any designated sites other than those discussed above;
- Upland acid grassland and improved grassland habitats;
- Rare or protected flora;
- All terrestrial mammals other than badger;
- Common lizards and smooth newts;
- Marsh fritillary butterflies or any other protected / priority invertebrates; and
- Direct effects on fisheries and other aquatic fauna.

6.8 Key Questions for the Council / Consultees

42. Key questions for the Council and Consultees are:

- Although negative effects on active peatland habitat will be avoided where possible through design, some small-scale effects on active peat habitats around the margins of existing infrastructure may occur, which will be compensated by habitat management elsewhere in the Site. Do the consultees agree with this approach?
- Are consultees content with the decision to scope out effects on lizards, newts, marsh fritillary and other protected / priority fauna?
- Do the consultees have any particular concerns about potential effects on watercourses or fisheries?
- Are there any other protected / priority flora or fauna that should be considered in the EcIA?

7 Ornithology

7.1 Introduction

1. This section sets out the approach to the evaluation of the ornithological interest of the Site and surrounding area, and to the assessment of potential effects on birds.

2. The Ornithology assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case than the decommissioning of the repowered wind turbines alone, should it be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

7.2 Suggested Methodology

4. The knowledge of the spatial and temporal occurrence of bird species within and surrounding the Site (see **Figure 7.1** of Appendix B) is essential to inform the likely effects of a development. The key objective of the ornithology surveys were to (i) provide baseline data on all extant ornithological features to establish the risk posed to birds due to the Development; (ii) to quantify the risk of collision with turbines to extant bird species flying through the Site throughout the year; and (iii) to identify locations of priority target species territories to establish risk posed due to the Development.

5. The survey programme and assessment methods have been designed and reviewed throughout following best practice information including:

- NIEA (2010). Wind Energy Development in Northern Ireland's Landscapes: Supplementary Planning Guidance to accompany Planning Policy Statement 18 'Renewable Energy'. NIEA Research and Development Series No 10/01, Belfast;
- DOE (2015). DOE Planning & Environment: Standing advice for planning officers and applicants seeking planning Permission for land which may impact on wild birds;
- Ruddock & Reid (2010). Review of windfarms and their impact on biodiversity: Guidance for developments in Northern Ireland. Report by the Natural Heritage Research Partnership, Quercus for the Northern Ireland Environment Agency, Northern Ireland, UK;
- Tosh et al. (2014). A review of the impacts of wind energy developments on biodiversity. Report prepared by the Natural Heritage Research Partnership (NHRP) between Quercus, Queen's University Belfast and the Northern Ireland Environment Agency (NIEA) for the Research and Development Series No. 14/02;
- SNH (2000). Windfarms and birds: calculating a theoretical collision risk assuming no avoiding action, Scottish Natural Heritage;
- SNH (2005). Survey methods for use in assessing the impacts of onshore windfarm on bird communities. Scottish Natural Heritage;
- SNH (2006). Assessing significance of impacts from onshore windfarms on birds' outwith designated areas. July 2006. Scottish Natural Heritage;
- SNH (2009). Guidance on methods for monitoring bird populations at onshore wind farms. Guidance Note, January 2009. Scottish Natural Heritage;
- SNH (2010a). Survey methods for use in assessing the impacts of onshore windfarms on bird communities. November 2005 (revised December 2010), Scottish Natural Heritage;
- SNH (2010b). Use of avoidance rates in the SNH wind farm collision risk model. Scottish Natural Heritage;
- SNH (2011). Guidance on assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage;
- SNH (2012a). Assessing the cumulative impact of onshore wind energy developments. Scottish Natural Heritage;
- SNH (2012b). Instruction Notice No. 099 - Dealing with development management casework where these is less raptor activity than expected. Scottish Natural Heritage;

- SNH (2013a). Recommended bird survey methods to inform impact assessment of onshore windfarms. Scottish Natural Heritage;
- SNH (2013b). Assessing connectivity with Special Protection Areas (SPAs). July 2013. Scottish Natural Heritage;
- SNH (2014a). Assessing the impact of small-scale wind energy proposals on the natural heritage. Version 2 June 2014. Scottish Natural Heritage;
- SNH (2014b). Flight speeds and biometrics for collision risk modelling. October 2014. Scottish Natural Heritage;
- SNH (2014c). Recommended bird survey methods to inform impact assessment of onshore wind farms. May 2014. Scottish Natural Heritage;
- SNH (2014d). Guidance on repowering wind farms: bird survey requirements. November 2014. Scottish Natural Heritage.
- SNH (2015a). Good practice during wind farm construction. Scottish Natural Heritage. Version 3; and
- SNH (2015b). Spatial planning for onshore wind turbines – natural heritage considerations. Scottish Natural Heritage.

7.2.1 Field surveys

6. The survey scope of works has been designed utilising best practice guidance. A scoping meeting was held with Northern Ireland Environment Agency (NIEA) ornithologist, Dr Neil McCulloch to agree the proposed survey scope and methods in March 2014 and subsequently in April 2015 to review the survey findings and future scope of survey works. Further consultation with Dr McCulloch was undertaken in March 2016 to again review survey scope.

7. Surveys were undertaken within the Site Boundary and prescribed buffers of 500 m, 800 m and 2 km around the Site Boundary were surveyed (see **Figure 7.1** of Appendix B) and targeted at specific species (see **Table 7.1**). It is recognised that the final layout and Development footprint will be smaller than the maximum Site Boundary defined in 2014 and that data and assessment will be adapted accordingly once the final layout and smaller footprint of the Development is defined.

8. The Site Boundary was digitally mapped in ArcGIS and defined as the maximum developable area. This was then buffered by 500 m to define the survey area ('500 m Survey Area') for breeding and wintering bird surveys, vantage point surveys and walkover surveys (see **Figure 7.1** of Appendix B). An 800 m buffer defined the search area for curlew during breeding season surveys ('800 m Survey Area'). The priority species survey area was defined as a 2 km buffer ('2 km Survey Area') to search for priority species breeding locations and/or territories or wintering locations (see **Figure 7.1** of Appendix B).

9. There was a suite of methods, compliant with best practice guidance, adopted to assess ornithology including the following field surveys which have been undertaken between 2014 and 2017:

- Breeding vantage point observation (March 2014 – August 2014);
- Wintering vantage point observation (September 2014 – February 2015);
- Spring migration vantage point observation (January 2014 – April 2014);
- Autumn migration vantage point observation (September 2014 – November 2014);
- Breeding walkover surveys (Brown & Shepherd[35] + passerines) (March 2014 – August 2014); including
  - Prey species surveys (April 2014 - July 2014); and
  - Woodland point counts (April 2014 – July 2014).
- Wintering walkover surveys (September 2014 – February 2015);
- Breeding priority species surveys (March 2014 – August 2014); including
  - Snipe surveys (May 2014); and
  - Red grouse surveys (April 2014; August 2014).
- Wintering priority species surveys (September 2014 – February 2015); and
- Supplementary breeding / wintering priority species surveys (March 2015 – August 2015; March 2016 – April 2017)

10. The surveys were undertaken by experienced field ornithologists, under licence from NIEA (where necessary).

11. Full details of the survey methods, survey effort, and weather conditions will be presented in the ES.

[35] Brown, A.F. & Shepherd, K.B. (1993). A Method For Censusing Upland Breeding Waders. *Bird Study* 40: 189-195.

7.2.1.1 Breeding & Wintering Vantage Point Surveys

12. Breeding and wintering vantage point surveys were undertaken from four vantage point locations (see **Figure 7.1** of Appendix B). These vantage point locations were selected to provide comprehensive spatial coverage (viewsheds) of the 500 m Survey Area.

13. The area visible from each vantage point was calculated in GIS and ground-truthed (i.e. confirmed during field surveys) to establish the physical visibility of the viewshed including landscape features (e.g. woodland, spoil heaps etc.) that are not accounted for in the computer modelling programme. The vantage points effectively covered the 500 m Survey Area to ground level, when truncated at 2 km and all airspace out to 2 km and beyond was visible.

14. Focal observations from vantage points over-looking the 500 m Survey Area were utilised to assess target species activity, flight height and flight routes in a hierarchical fashion (see **Table 7.1**). Where primary target species were recorded inside the 500 m Survey Area, the detection time, flight trajectory, flight duration (to the nearest second) and flying height above ground level (a.g.l.) was recorded visually at detection and at 15 second intervals thereafter. Other secondary target species (see **Table 7.1**) had flight routes mapped and flying height recorded at detection and the altitudinal range in which it occurred throughout the bout.

15. Ornithologists scanned a 180° arc both visually and with binoculars. A range of diurnal and crepuscular times and weather conditions were sampled. Methods followed those recommended by SNH (2005; 2013; 2014) and Band *et al*., (2007) in order to provide data to inform collision risk modelling requirements, if necessary.

16. Vantage point surveys were carried out over the breeding period (March 2014 to August 2014) and wintering period (September 2014 to February 2015) in order to collect information on flying heights, distribution and occurrence of target species and assess the risk posed by the Development from collision.

17. A total of 36 hours from each vantage point was undertaken during the breeding season 2014 and a further 36 hours during the wintering season 2014 – 2015. That is, a total of 72 hours has been completed from each vantage point location. Collectively 288 hours vantage point hours have been completed.

7.2.1.2 Migration Vantage Point Surveys

18. Bird migration occurs in two distinct seasonal periods i.e. autumn migration arbitrarily defined from September to November and spring migration arbitrarily defined from late January to late March/early April in Northern Ireland. Additional vantage point locations (see **Figure 7.1** of Appendix B) were selected to undertake migration season observations in order to assess occurrence of any movement corridors or migration routes particularly for waders, geese and swans and other key target species (see **Table 7.1**).

19. These focal observations of target species were carried out from a single vantage point located to assess the spatial distribution and occurrence of migrating birds over-flying the 500 m Survey Area. The autumn migration vantage point (AMVP) and spring migration vantage point (SMVP) were selected on ground to maximise visibility and covered a viewing arc of 180° facing north (in autumn) and south (in spring) of the survey area to maximise the detection of arriving or departing birds and/or localised movements of over-flying migrants.

20. Methods of recording and detection were the same as for breeding / wintering vantage point surveys and again a range of times and weather conditions were sampled, although surveys were not conducted during periods of very high winds or persistent heavy rain. However, when encountered, intermittent periods of poor visibility (i.e. fog) were surveyed using auditory techniques. A range of crepuscular and daytime hours were sampled each month which covered the dawn and dusk periods in order to assess movements to / from roosting / foraging areas.

21. A total of 36 hours from each vantage point was undertaken during the spring migration season of 2014 (January 2014 – April 2014) and a further 36 hours during the autumn migration season in 2014 (September 2014 – November 2014). That is, a total of 72 hours has been collectively completed for migration season(s).

7.2.1.3 Breeding walkover surveys

22. Breeding bird territories were surveyed using a modified Brown & Shepherd (1993) transect methodology to incorporate passerines. Surveys were to provide breeding estimates and distribution for all bird species within the 500 m Survey Area and for breeding curlew within the 800m Survey Area. These surveys also included an assessment of the abundance and

distribution of meadow pipits and skylarks, considered to be important prey species for hen harriers and merlin. Point counts were undertaken at any areas of impenetrable woodland or where access was constrained.

23. The location and activity of birds were recorded using standard (BTO) codes at the point of detection. Summary maps were compiled showing the location of each identified territory or breeding pair. Population estimates were derived by comparing the summary maps for each survey and identifying distinct territories by assessing breeding behaviours and spatial locations to establish breeding status as either confirmed, probable, possible or non-breeding. The conservation status of each bird species is defined based on Eaton *et al.,* (2015)[36] and Colhoun & Cummins (2013)[37].

24. A minimum of 24 to 36 hours of survey were completed each month between March 2014 and August 2014 covering all parts of the Site and the area falling within the 500 m and 800 m Survey Areas.

7.2.1.4 Wintering walkover surveys

25. Winter bird surveys were carried out using transects covering the 500 m Survey Area during the winter period (September 2014 to February 2015). Surveys covered the ground systematically over the winter season with transects and constant search effort.

26. A minimum of six to nine hours survey was carried out each month over the wintering season September 2014 to February 2015 with all species recorded using standard BTO codes and mapped at the point at which they were detected along with any associated behaviour codes. The conservation status of each bird species is defined based on Eaton *et al.,* (2015) and Colhoun & Cummins (2013).

7.2.1.5 Breeding priority species surveys

27. Priority species searches were carried out between March and August to establish if suitable habitat(s) contained breeding target species to identify risk species for turbine collision or displacement. These searches include specific assessments of the suitable habitat(s) to identify nesting distribution and breeding status for species of high conservation concern (see **Table 7.1**) notably Annex I (EU Birds Directive), Schedule 1 (Wildlife (Northern Ireland) Order 1985) and Birds of Conservation Concern (Colhoun & Cummins, 2013; Eaton *et al.*, 2009; 2015) within the 2 km Survey Area.

28. A minimum of nine to 15 hours survey were carried out each month over the breeding season March 2014 to August 2014 with all species recorded using standard BTO codes and mapped at the point at which they were detected along with any associated behaviour codes and nest locations identified.

29. **Raptor surveys** - surveys for breeding raptors specifically followed prescribed methods (Hardey *et al*., 2009) between March 2014 and August 2014.

30. **Red grouse surveys** - additional breeding season surveys were carried out for red grouse in April 2014 and August 2014. This method comprises dusk and dawn counts for calling grouse within suitable habitat to establish the abundance and distribution within the 500 m Survey Area in April. In August, a walkover survey was conducted with a trained dog to identify the locations of red grouse coveys, if any, within the 500 m Survey Area.

31. **Wader surveys** - curlew, golden plover, lapwing and snipe were also specifically targeted during additional searches between March 2014 and August 2014 and additional walkover surveys were conducted where required. These also include "dusk" surveys during May to look and listen for displaying ('drumming' and 'chipping') snipe within the 500 m Survey Area and also locations which were recorded from vantage points. Curlew were surveyed across the 2 km Survey Area using vantage point and walkover surveys of suitable habitat and all sightings of curlew were followed up to establish breeding activity.

32. To establish the final location of all priority breeding species including curlew, lapwing and snipe territories; cumulative analyses were undertaken which integrates observations from the vantage points, breeding bird surveys and priority species searches to identify distinct territories.

[36] Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R., (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* 108: 708–746.
[37] Colhoun, K. & Cummins, S. (2013). Birds of conservation concern in Ireland 2014 – 2019. Irish Birds 9: 523-544.

7.2.1.6 Wintering priority species surveys

33. During the winter, between September 2014 and March 2015, surveys were carried out to identify any target species (see **Table 7.1**) and particularly surveyed for hen harrier winter roosts and whooper swan and/or goose roosting and foraging areas and/or commuting routes. Surveys for wintering hen harrier roosts were carried out at suitable habitat (Hardey *et al.*, 2009) at dawn and/or dusk.

34. Whooper swan and goose surveys were carried out within all parts within the 2 km Survey Area during each survey visit as well as wider (5-10 km) searches were carried out to identify the nearest whooper swan wintering areas and surveys of published whooper swan wintering areas (Robinson *et al.*, 2004[38]). Swan / goose roosts identified were also observed at dawn / dusk to establish numbers occurring and the direction of arrival / departure to / from roosts.

35. A minimum of six to nine hours survey was carried out each month over the wintering season September 2014 to February 2015 with all species recorded using standard BTO codes and mapped at the point at which they were detected along with any associated behaviour codes, flight routes and flock size.

7.2.1.7 Supplementary breeding / wintering priority species surveys

36. NIEA initially confirmed (9th April 2015) that no additional supplementary surveys would be necessary (N. McCulloch, personal communication) following the comprehensive suite of surveys carried out in 2014 – 2015. Nonetheless, the Applicant commissioned additional surveys which were undertaken throughout the breeding season of 2015 (March 2015 to August 2015). Following further consultation confirmed with NIEA on 22nd March 2016 additional supplementary surveys were undertaken in 2016 - 2017 (March 2016 – April 2017) to maintain understanding and knowledge of priority species breeding and wintering locations and to monitor changes, if any, as agreed with NIEA.

37. A minimum of six to 30 hours were completed in each of these months including surveys of raptors, waders (snipe, curlew), red grouse and wintering swans / geese and raptors. Surveys followed the same methods as previously described for each of these species or species assemblage.

7.2.2 Assessment & Reporting

38. The assessment will follow the guidance set out in the EIA Regulations and will follow standardised guidance (CIEEM, 2016) to focus on potentially significant effects. The aim of the assessment is to inform consultees and the planning authority that sufficient information and robust assessment is available to establish whether the Development, either alone or in combination with other plans or projects, will not have significant effects on ornithology.

39. Effects arising from the decommissioning, construction and operational phases, presents three main risks to birds:

- Direct loss of breeding, wintering and/or foraging habitat, due to the footprint of development;
- Direct mortality due to collision with the turbine blades, nacelles, towers and/or ancillary windfarm infrastructure (e.g. sub-station, battery housing, power-lines, meteorological masts); and
- Displacement of birds as a result of increased disturbance and/or decreased suitability of breeding, wintering and/or foraging habitats.

40. Disturbance can take varying formats and occur over short or long temporal periods. The effects may be transient (e.g. short-term alteration in behaviour) or permanent (e.g. total displacement from the breeding or wintering locations). Disturbance effects may be lower depending on the tolerance and/or experience/habituation of individuals or species (Ruddock & Whitfield, 2007[39]; Whitfield *et al*., 2008[40]).

41. Effects are likely to occur in the following phases;

- During the decommissioning of the Operational Corkey Windfarm;

[38] Robinson, JA, K Colhoun, JG McElwaine & EC Rees. (2004). *Whooper Swan* Cygnus cygnus *(Iceland population) in Britain and Ireland 1960/61 – 1999/2000*. Waterbird Review Series. The Wildfowl & Wetlands Trust/Joint Nature. Conservation Committee, Slimbridge.
[39] Ruddock, M. & Whitfield, D.P. (2007). A review of disturbance distances in selected bird species. Report from Natural Research (Projects) Ltd to Scottish Natural Heritage. Natural Research, Banchory, UK.
[40] Whitfield, D.P., Ruddock, M. & Bullman, R. (2008). Expert opinion as a tool for quantifying bird tolerance to human disturbance. *Biological Conservation* 141: 2708-2717

- During the construction phase of repowered turbines and associated infrastructure;
- During the operational phase of the Development; and
- Subsequent decommissioning if necessary.

42. The decommissioning / construction phases will occur over a short temporal period (approximately eight months) whilst the operational phase will occur over the operational life-time of the Development, in perpetuity. Cumulative effects can also occur temporally or spatially in combination with other nearby proposals.

43. In addition to the policy and guidance documents identified in Section 7.2 of this Scoping Request, further consideration will also be given to the published scientific literature and also to the following during assessment:

- Environmental Impact Assessment Directive 85/337/EEC (as amended);
- EU Council Directive 2009/147/EC on the Conservation of Wild Birds (Birds Directive);
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of wild flora and fauna (the Habitats Directive);
- The Conservation (Natural Habitats, etc.) Regulations 1995 (as amended) which transposes the Habitats Directive into law in Northern Ireland (the Conservation Regulations);
- The Wildlife (Northern Ireland) Order 1985 (as amended) (the Wildlife Order);
- The Wildlife & Natural Environment (Northern Ireland) Act 2011;
- Planning Policy Statement 2 (PPS 2) Planning & Nature Conservation;
- Planning Policy Statement 18 (PPS 18);
- JNCC (2012) UK Biodiversity Action Plan;
- Local Biodiversity Action Plans (www.biodiversityni.com);
- Balmer et al. (2013). Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland. British Trust for Ornithology;
- Colhoun & Cummins (2013). Birds of conservation concern in Ireland 2014 – 2019;
- Eaton *et al*., (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man; and
- CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition.

7.2.2.1 Identification and evaluation of effects

44. In the first instance, the Development will avoid significant effects by sensitive design of the windfarm layout and programme of works. Following the results from each survey and assessment of the baseline, the effects of the Development will be analysed in isolation and in combination (with cumulative developments) and considered based on:

- Type;
- Extent;
- Magnitude;
- Duration;
- Reversibility;
- Timing; and
- Frequency

45. Effects will be reported according to EIA Regulations as either significant or not significant in the context of the conservation status (Colhoun & Cummins, 2013; Eaton *et al.*, 2015) and population status and trends of each potentially affected species. If necessary, upon assessment of the impact of the Development, this process considers the necessary mitigation and / or enhancement measures together with any residual impacts, as well as cumulative effects.

7.3 Baseline

7.3.1 Designated Sites

46. The Site is not located within any nationally or internationally designated sites for ornithological features. The Site is adjacent to the Antrim Coast and Glens AONB. The Antrim Hills SPA designated for hen harrier and merlin is located approximately 1 km away from the Site Boundary. This SPA was designated in 2006 which is 12 years after the approval of the operational windfarm at Corkey in 1994. An adjacent windfarm (Gruig) was approved in 2007 post-designation of the SPA and a single turbine approved to the west more recently in 2012.

47. The Slieveanorra & Croaghan ASSI (designated in 2009) is located approximately 3 km away from the Site Boundary and is designated for peatland habitats, but also lists hen harrier, merlin, snipe, red grouse and raven in the citation documents. The Slieveanorra Nature Reserve is located within 5 km of the Site Boundary and cites hen harrier, merlin and grouse. There are several other designated sites between 5 km and 10 km of the Site Boundary some of which cite ornithology features (see **Table 7.2**). Baseline surveys and assessment will consider any flight path connectivity between designated sites.

7.3.2 Survey Results to Date

48. An extensive suite of desktop reviews and surveys have been completed, and full results will be presented in the Environmental Statement; however the key findings are as follows:

- Desktop reviews are being undertaken of published distributional data from National Biodiversity Network (NBN), CeDaR, British Trust for Ornithology (BTO) and Northern Ireland Raptor Study Group (NIRSG);
- During the breeding season (BVP) there were 12 target species recorded whilst 13 species were recorded during the winter. Fewer target species were recorded during spring migration (seven species) and autumn migration (seven species);
- Most frequently detected species from all vantage point surveys were raven, lesser black-backed gull, buzzard and snipe although the detection frequency varied by vantage point type and seasonally;
- The locations of the target one priority species were mapped by vantage point type. The majority of target one species (see **Table 7.1**) flights were typically low level including curlew (all <25 m a.g.l.), hen harrier (all <25 m), merlin (<25 m), whilst golden plover were recorded between <10 m and >150 m a.g.l. and peregrine were recorded between <10 m and >150 m a.g.l. There were no geese or swans recorded within the 500 m Survey Area during vantage point observations;
- There were 50 species recorded during breeding walkover surveys and a smaller number, 35 species, recorded during winter walkover surveys;
- Priority species breeding locations confirmed that curlew, buzzard, sparrowhawk, kestrel, raven, red grouse, snipe and peregrine were all recorded breeding within 2 km Survey Area. One curlew territory occurred within the 800 m Survey Area to the north of the Operational Corkey Windfarm. Nearest breeding hen harrier and merlin were recorded more than 2 km away and the hen harrier were likely to have been displaced during 2014 from their traditional breeding location, possibly as a result of spring forest harvesting. Two other successful breeding hen harrier locations were identified beyond the 2 km Survey Area to the north and north-east respectively. Peregrine falcons fledged three young within the 500 m Survey Area and some flight activity was noted in the post-fledging period in the 500 m Survey Area during vantage point surveys;
- Wintering priority species were recorded widely within the 2 km Survey Area (including gulls, buzzard, kestrel, golden plover cormorants, heron, peregrine, snipe, hen harrier, red grouse and raven). Gulls and cormorants were typically associated with the nearby reservoir and there were no wintering swan or geese roosting or foraging areas recorded within the 2 km Survey Area. Greylag geese were recorded once flying in a north-south direction to the east of the 2 km Survey Area, over winter and whooper swans (20 – 45 birds) and greylag geese (± 200) were recorded roosting north-west of the 2 km Survey Area. This is a known traditional whooper swan (and greylag goose) roost. All observed goose/swan flights from this area departed or arrived to / from the north and / or north-west of the lakes;
- A hen harrier winter roost area was identified within the 2 km Survey Area and the maximum roost count was one bird (female only) and was used only infrequently over the winter survey period. Several other suitable areas of roosting habitat occurred within the 2 km Survey Area but no hen harriers were observed, although another roost identified north of Lissanoure (>2 km from Site Boundary) was recorded to have a maximum of two roosting harriers (one male, one female); and
- There were relatively small changes observed in supplementary priority species surveys, with species in similar locations and/or abundances between years.

7.4 Key Sensitivities

49. The key sensitivity identified is the presence of breeding peregrine falcons in the 500 m Survey Area. Flight activity for this species will require to be assessed during collision risk modelling once final turbine layout and turbine metrics are known.

50. Curlew were recorded in the 2 km Survey Area. Since only a small part of the Site Boundary lies within 800 m of the recorded curlew location (which is the published spatial sensitivity of this species (800 m; Pearce-Higgins et al., 2009; 2012)) , the Development will be designed to avoid this buffer and as such no significant effects are anticipated.

51. A number of breeding snipe territories were recorded within the footprint of the Operational Windfarm , and despite the reported sensitivity of this species to windfarms (Pearce-Higgins *et al.*, 2009; 2012) there were more snipe within the

Operational Windfarm than in the wider area. Consideration will be given to these findings in the context of habituation and displacement, and thus are considered to have lesser effects from the Development subject to sensitive design and mitigation measures (e.g. during the construction phase).

52. Since the Site is within close proximity to the Antrim Hills SPA designated for hen harrier and merlin, careful consideration will be given to these two species and the potential effects of the Development on these species. There were no nesting or roosting sites for either identified within the Site and flight activity was all low elevation and relatively infrequent for both of these species during vantage point surveys. If necessary an appropriate assessment will be prepared in consideration of the SPA and associated site features, although currently this is not considered a likely requirement.

7.5 Scoped In Effects

53. The baseline data will be incorporated into the design and constraints process in the first instance to inform the design, layout iteration process as well as to minimise impacts of displacement or collision. An assessment will be undertaken once the scheme design is finalised. Collision risk modelling (CRM) required for peregrine falcon and displacement modelling required for snipe and curlew as well as footprint analysis for smaller passerines will be undertaken. There will be due consideration of all species recorded flying through the 500 m Survey Area and any potential significant effects arising from the final layout design will be considered.

54. The surveys conducted here have provided an excellent baseline of data that is compliant with best practice guidance. Whilst the numbers or locations of species may vary marginally between years, the data is considered to provide a robust baseline for minimising impacts during the design and constraints process and also for establishing the potential for significant effects, if any, during the final assessment of the Development.

7.6 Scoped Out Effects

55. Further consideration and assessment is required based on a final layout, prior to determining if any ornithological effects can be scoped out of the assessment. It is anticipated that direct effects on Curlew territories can be scoped out at this stage, due to the distance between the recorded Curlew location and Indicative Developable Area as described in **Figure 2.1** of Appendix B, to be agreed through further consultation.

56. It is noted that there is strong evidence of habituation of some species within the Operational Corkey Windfarm, in particular numerous active (and successful) snipe territories were recorded within the Operational Corkey Windfarm therefore indicating habituation to operational turbines.

57. Red grouse territories recorded within the Operational Corkey Windfarm and at one territory a covey of seven birds was recorded in the autumn counts, so grouse are breeding successfully in the Site Boundary. The baseline findings indicate habituation to the operational turbines but these, and other species, may still be vulnerable to construction or decommissioning activities.

58. There were no goose or swan flights recorded within the vantage point surveys over the Site Boundary, despite wider occurrence of roosting whooper and greylag. There appears to be no connectivity or movement corridor for these species near the Site Boundary and thus low weighting shall be given to effects on these species.

59. Some (non-breeding) golden plover flights were recorded, which could be subject to collision risk. However published literature indicates that this species shows considerable avoidance and lack of effect due to windfarms (Fielding & Haworth, 2010[41]; Douglas *et al.*, 2011[42]). Thus significant effects may be considered unlikely based on published literature, as such they will be considered within the ES at this stage, but no collision risk model is proposed to be undertaken for this species, as agreed with NIEA (9th April 2015).

[41] Fielding, A.H., Haworth, P., (2010). Farr windfarm: A review of displacement disturbance on golden plover arising from operational turbines between 2005-2009. Unpublished report by Haworth Conservation Ltd.
[42] Douglas, D.J.T., Bellamy, P.E & Pearce- Higgins, J.W. (2011). Changes in the abundance and distribution of upland breeding birds at an operational wind farm. Bird Study 58: 37-43.

7.7 Key Questions for the Council / Consultees

60. Key questions for the Council and Consultees are:

- Do consultees agree that the surveys completed are of sufficient scope to allow an effective assessment?
- Do consultees hold any specific additional information that should be incorporated either in to the design or assessment for the Development?
- Do consultees have any topics or details that they would require more information on within the assessment?

Table 7.1: Details of species surveyed during vantage point observations and priority species searches.

Species	Vantage Point (Target 1) *	Vantage Point (Target 2) **	Migration Vantage Point	Priority Species Surveys (2km)
Hen harrier	•		•	•
Peregrine falcon	•		•	•
Merlin	•		•	•
White-tailed eagle	•		•	•
Golden eagle	•		•	•
Goshawk	•		•	•
Osprey	•		•	•
Red kite	•		•	•
Marsh harrier	•		•	•
Golden plover	•		•	•
Whooper swan	•		•	•
Mute swan	•		•	•
Chough	•		•	•
Barn owl	•		•	•
Short-eared owl	•		•	•
Long-eared owl	•		•	•
Red grouse	•		•	(500 m)
Curlew	•		•	•
Geese (all species)	•		•	•
Buzzard	•	•	•	•
Kestrel	•	•	•	•
Sparrowhawk	•	•	•	•
Snipe	•	•	•	(500 m)
Lapwing	•	•	•	•
Raven	•	•	•	•
Grey heron		•	•	•
Cormorant		•	•	•
Corncrake		•	•	•
Waders (all species)	•	•	•	•
Ducks (all species)		•	•	•
Grebes (all species)		•	•	•
Gulls (all species)		•	•	•
Terns (all species)		•	•	•
SPA citation species (all)	•	•	•	•

* Target 1 species are recorded to the nearest minute, and assigned a five minute interval and the flight route is mapped. Flying height (at 15 second intervals) and flight duration to the nearest second are recorded

** Target 2 species are recorded to the nearest minute and assigned a five minute interval and have flight route mapped. Height is recorded at point of detection and an altitudinal range also recorded for the duration of the bout.

Table 7.2: Details of designated sites within 10 km of the Site Boundary

Reference	Name	County	Status	Distance from Site Boundary (km)	Primary Site Features	Secondary Site Features	Year
UK9020301	Antrim Hills	Antrim	SPA	1.0	Hen harrier, merlin	-	2006
ASSI303	Slieveanorra and Croaghan	Antrim	ASSI	2.8	Peatlands	Hen harrier, merlin, snipe, red grouse and raven	2009
NR20	Slievanorra Forest	Antrim	NNR	4.2	Peatlands	Hen harrier, merlin, red grouse	-
ASSI123	Caldanagh Bog	Antrim	ASSI	6.6	Lowland raised bog	Curlew, snipe, golden plover	1996
ASSI067	Garron Plateau	Antrim	ASSI	7.4	Peatlands	Red grouse, golden plover, dunlin, common sandpiper, merlin, peregrine falcon, buzzard, hen harrier, raven	1994
UK12010	Garron Plateau RAMSAR site	ANTRIM	RAMSAR	7.4	Peatlands	Golden plover	1998
ASSI082	Tievebulliagh	Antrim	ASSI	8.0	Flora, fauna, geological and physiographical features	Peregrine falcon	1995
ASSI254	Glenballyemon River	Antrim	ASSI	8.1	Riverine	Dipper	2009
ASSI161	Breen Wood	Antrim	ASSI	10.3	Woodlands	Wood warbler, buzzard, pied flycatcher	1997
NR7	Breen Oakwood	Antrim	NNR	10.4	Woodlands	Treecreeper, buzzard, sparrowhawk	-

8 Noise

8.1 Introduction

1. This section of the Scoping Request sets out the proposed methodology and approach to be applied in the assessment of noise due to the Development.

2. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case, than the decommissioning of the Development alone, should it be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

4. This section of the Scoping Request presents the suggested methodology and scope of the noise assessment, detailing those elements proposed to be scoped in and scoped out of the EIA assessment process. As discussed in **Section 8.6,** no significant effects are considered likely to arise as a result of decommissioning / construction activity, and the operation of the battery storage facility, leaving only noise arising from the operation of the proposed wind turbines as the only phase with the potential to give rise to a significant effect.

5. Sources of noise during operation of a wind turbine are both mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions from the nacelle through isolation of mechanical components and acoustic insulation of the nacelle. Aerodynamic noise is controlled through the design of the blade tips and edges. In most modern wind turbines, aerodynamic noise is also restricted by control systems which actively regulate the pitch of the blades.

6. Whilst noise from the wind turbines increases with wind speed, at the same time ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified noise level limits.

7. The effects of noise from the Development will be assessed in consultation with the Environmental Health Officer of the Council, who has been provided with a document detailing the suggested assessment methodology.

8.2 Suggested Methodology

8. Current planning policy for renewable energy developments in Northern Ireland is contained in Planning Policy Statement 18: Renewable Energy [43] (PPS18), and the accompanying Best Practice Guidance[44] (BPG). The BPG refers to the use of ETSU-R-97[45] for the assessment of windfarm noise, although in January 2015, the Northern Ireland Assembly Environment Committee published a report on its inquiry into wind energy[46], which included a recommendation that the use of the ETSU-R-97 guidelines should be reviewed on an urgent basis and that more appropriate guidance should be put in place. To date, that guidance has not emerged, and the use of ETSU-R-97 remains valid.

[43] Department of the Environment Northern Ireland (2009), Planning Policy Statement 18 Renewable Energy. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/planning_policy_statement_18__renewable_energy.pdf [Accessed on 11/07/2017]

[44] Department of the Environmental Northern Ireland (2009), Best Practice Guidance to Planning Policy 18 'Renewable Energy'. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements/planning_policy_statement_18__renewable_energy__best_practice_guidance.pdf [Accessed on 11/07/2017]

[45] ETSU for the DTI (1997), ETSU-R-97 The Assessment and Rating of noise from Windfarms.

[46] Northern Ireland Assembly Environment Committee (2015), Report on the committee's Inquiry into Wind Energy 29 January 2015 NIA 226/11-16 ISBN: 978-0-339-60553-4.

9. In March 2016, the Department of the Environment launched a call for evidence in relation to strategic planning policy for renewable energy development[47]. This evidence will inform a future revision to policy and guidance in relation to windfarm development in Northern Ireland.

10. The Institute of Acoustics' (IOA) Good Practice Guide to the application of ETSU-R-97[48] (GPG) is currently endorsed for use in Northern Ireland, with the exception of the Example Planning Condition provided in Appendix B of the GPG.

11. Based on the above, the assessment will therefore be conducted in accordance with ETSU-R-97 and the GPG, as these represent current guidance and best practice.

8.3 Baseline

12. It is a key principle of the ETSU-R-97 methodology that noise from operational wind turbines should not be regarded as a component of background noise.

13. The cumulative context comprises other commercial windfarms of various scales, as well as single turbines. With regard to cumulative schemes, the windfarm most likely to influence background noise levels is the Operational Corkey Windfarm, which the Development will ultimately replace. In addition, Gruig Windfarm, which lies immediately adjacent to the Development, influences the current background noise levels. The operational Altaveedan Windfarm lies 4 km to the north. A cluster of three operational windfarms are located at a range of 11 to 13 km, although these are sufficiently distant to be unlikely to influence the background noise environment in the vicinity of the Development.

14. The GPG provides advice on how appropriate background noise measurements can be made in the presence of existing wind turbines by the following methods:

- Switching off the existing wind turbines during the background noise survey;
- Accounting for the contribution of the existing wind turbines in the measurement data by directional filtering or subtracting a prediction of noise from the existing windfarms;
- Utilising an agreed proxy location removed from the area acoustically affected by the existing wind turbines; or
- Utilising background noise data presented with the Environmental Statements / Reports for the existing wind turbines (the suitability of the background noise level data should be established).

15. For turbines not under the control of the Applicant, switching off these turbines is not likely to be possible as they are not within the control of the Applicant. Identification of a proxy location with an acoustic environment representative of nearby receptors in the absence of wind turbine noise is unlikely to be practicable due to the site-specific nature of the background noise environment. Background noise data in previous assessments has been found to be unavailable, or not collected in accordance with the GPG and therefore unsuitable for use in the current assessment. It is therefore proposed to use either directional filtering or subtraction of predicted noise due to the existing wind turbines to exclude the effects of operational noise.

16. Due to the location of the cumulative wind turbines relative to the Development, directional filtering has the disadvantage that it would exclude measurements made under wind directions that are most relevant to the assessment, i.e. those from the location of the Development toward the receptors. This therefore leaves subtraction of predicted noise levels due to the existing turbines as the most suitable methodology. This approach is likely to be conservative, as windfarm noise prediction methods recommended in the GPG are designed to produce typical worst-case results.

17. The resulting baseline noise measurements will then be analysed in accordance with the ETSU-R-97 and the GPG, including corrections for the effects of operating wind turbines, to derive representative prevailing background noise curves relative to 10 m standardised wind speed for each monitoring location. The appropriate daytime fixed lower noise limit will be determined taking into account the three factors discussed in ETSU-R-97 and the GPG (the number of affected properties,

[47] Department of the Environment (2016), call for Evidence: Strategic planning policy for Renewable Energy Development.
[48] Institute of Acoustics (2013), A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

the effects on the amount of energy generated and the magnitude and duration of exposure), and appropriate noise limits defined.

8.4 Key Sensitivities

18. The assessment is limited to the effects on human receptors at noise-sensitive locations as defined in PPS18[43], namely residential properties, schools, hospitals and places of worship. Each of these receptor types are considered to be of equal value.

19. At present, the design of the Development is not sufficiently advanced to allow for preparation of a noise contour plot to assist in the identification of baseline noise monitoring locations and the key sensitive receptors. These locations will be confirmed through modelling prior to installing the background noise monitoring equipment, and further consultation carried out with the Council to agree on their selection.

8.5 Scoped in Effects

8.5.1 Cumulative Assessment

20. ETSU-R-97 and the GPG state that the noise limits apply to the cumulative effect of noise from all wind turbines that may affect a particular location. Therefore a search will be undertaken to identify any developments either operational, consented or in planning which may require consideration in the assessment process. A screening exercise will then be carried out to identify which of these require inclusion in the cumulative assessment, based on consideration of the '10 decibel difference' rule described in the GPG. It should be noted that the wind turbines comprising the Operational Corkey Wind Farm will be removed and therefore do not require consideration in the cumulative assessment.

21. Cumulative assessment will then be undertaken for each development identified by the initial screening exercise, taking account of any relevant planning conditions, installed turbine type, available headroom, controlling properties and the effects of wind direction as described in the GPG. As previously noted, a number of cumulative developments are likely to require assessment, in particular, the operational Gruig Windfarm, located to the south-east of the Development.

8.6 Scoped Out Effects

8.6.1 Low-Frequency Noise

22. A study[49], published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI), investigated low frequency noise from windfarms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines, but that complaints attributed to low frequency noise were, possibly due to a phenomenon known as Amplitude Modulation (AM), described in **Section 8.6.2**.

23. In February 2013, the Environmental Protection Authority of South Australia published the results of a study into in infrasound levels near windfarms[50]. This study measured infrasound levels at urban locations and rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near windfarms are comparable to levels away from windfarms in both urban and rural locations. Infrasound levels were also measured during organised shut-downs of the windfarms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.

24. Bowdler *et al*., (2009)[51] concluded that:

25. "*...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from windfarms generally has adverse effects on windfarm neighbours*".

26. It is therefore not considered necessary to carry out specific assessments of low frequency noise or infrasound.

[49] Hayes McKenzie (2006). 'The measurement of low frequency noise at three UK windfarms', Hayes Mckenzie, The Department for Trade and Industry, URN 06/1412, 2006.
[50] Environment Protection Authority (2013). 'Infrasound levels near windfarms and in other environments'. Available Online At: http://www.epa.sa.gov.au/xstd_files/Noise/Report/infrasound.pdf (Accessed on 26/06/2017).
[51] Bowdler et al (2009). 'Prediction and Assessment of Wind Turbine Noise: Agreement about relevant factors for noise assessment from wind energy projects'. Acoustics Bulletin, Vol 34 No2 March/April 2009, Institute of Acoustics.

8.6.2 Amplitude Modulation

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

28. A study[52] was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford, which investigated the incidence of noise complaints associated with windfarms and whether these were associated with AM. The study defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the prevalence of AM on UK windfarm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

29. The study concluded that AM had occurred at only a small number (4 of 133) of windfarms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of AM are not well understood and that prediction of the effect was not currently possible.

30. This research was updated in 2013 by an in-depth study undertaken by Renewable UK[53], which has identified that many of the previously suggested causes of AM have little or no association to the occurrence of AM in practice. The generation of AM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, it is not possible to predict whether any particular site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government.

31. In 2016, the IOA proposed a measurement technique[54] to quantify the level of AM present in any particular sample of windfarm noise. This technique is supported by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change) who have published guidance[55], which follows on from the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition. Notwithstanding this, the suggested outline planning condition is as yet unvalidated, remains in a draft form and would require site-specific legal advice on its appropriateness to a specific development. Section 7.2.1 of the GPG therefore remains current, stating: "*The evidence in relation to 'Excess' or 'Other' Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM*".

32. It is therefore not considered necessary to carry out specific assessments of amplitude modulation.

8.6.3 Construction Noise

33. In this context, Construction Noise includes the decommissioning of the Operational Corkey Windfarm, construction of the Development including the battery storage facility, and the eventual decommissioning of the Development if required.

34. The following legislation and standards are of particular relevance to construction noise:

- The Environmental Protection Act 1990 (EPA 1990)[56]; and
- BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5228)[57].

35. The EPA 1990 specifies mandatory powers available to Local Authorities in respect of any noise that either constitutes or is likely to cause a statutory nuisance, which is also defined in the Act. A duty is imposed on Local Authorities to carry out

[52] University of Salford (2007). 'Research into aerodynamic modulation of wind turbine noise'. Report by University of Salford, The Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007.
[53] Renewable UK (2013). 'Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects', Renewable UK, 2013.
[54] Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise,
[55] BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines,
[56] The UK Government (1990) The Environmental Protection Act 1990.
[57] British Standards (2014), BS 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites, part 1 - Noise.

inspections to identify statutory nuisances, and to serve abatement notices against these. Procedures are also specified with regards to complaints from persons affected by a statutory nuisance. BS 5228 provides guidance on controlling noise and vibration from construction sites. It:

- Refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction sites;
- Recommends procedures for noise and vibration control in respect of construction operations; and
- Stresses the importance of community relations, stating that early establishment and maintenance of these relations throughout the carrying out of site operations will go some way towards allaying people's concerns.

36. The acceptability of construction noise is likely to be affected by the location of the Development relative to the noise-sensitive premises; existing ambient noise levels; the duration and working hours of site operations; the characteristics of the noise produced and the attitude of local residents to the site operator.

37. As the Development consists of the repowering of an operational windfarm, it is anticipated some elements of the existing site infrastructure will be reused such as access tracks, thereby minimising the amount of construction works required. In addition, due to the large separation distances likely to exist between the construction works and the nearest noise sensitive receptors, it is anticipated that a detailed assessment of construction noise effects will not be required. This will be discussed and agreed though consultation with the Council. Notwithstanding this, the ES will provide a summary of relevant guidance and best practice construction methods, along with a commitment to adhere to Best Practice means of controlling noise from construction activities, as advocated by BS 5228.

8.6.4 Battery Storage

38. Whilst feasibility work remains ongoing, there is potential for the Development to include a battery storage facility. Such facilities do not generate high levels of operational noise, and is likely to be limited to switchgear and cooling plant such as air conditioning units. The batteries and associated equipment will be housed within a suitable building, providing both visual and acoustic screening.

39. At this stage, the location and specification of the battery storage facility is yet to be established, and as such, it is not possible to fully scope out the element at this stage. However, once the general design of the facility has been finalised, noise modelling will be undertaken to establish likely operational noise levels at given distances. The location of the storage facility will be sensitively sited taking into account these identified separation distances to ensure no significant effects.

40. It is therefore anticipated that the resulting noise levels will be sufficiently low as to allow the facility to be scoped out of the ES. This will be confirmed through consultation with the Council, and subject to their agreement, the results will be included as an appendix to the ES in the interest of completeness.

8.7 Key questions for the Council / Consultees

41. Key questions for the Council and Consultees are:

- Do the Consultees agree with the proposed methodology and general scope of assessment?
- Do the Consultees have any updates on the position of the Northern Ireland Assembly Environment Committee and the Department of the Environment on the use of ETSU-R-97 in the assessment of noise from windfarms? In the absence of such updates, is the approach proposed in this Scoping Request considered appropriate?
- Do the Consultees agree that the subtraction of predicted noise levels due to the existing turbines from the measured background noise level is the most suitable methodology to ensure a robust background noise dataset?
- Do the Consultees have details of any further cumulative developments in the locality which it considers may result in potential significant effects, which should be assessed as part of the EIA process for the Development?

9 Archaeology and Cultural Heritage

9.1 Introduction

1. The assessment will consider direct, indirect (largely visual) and cumulative effects as a result of the Development upon the following receptors:

- Archaeology - above and below ground, designated or not. Consideration will be given to the potential for currently unknown (buried) archaeological remains to exist within the Development; and
- Cultural Heritage – World Heritage Sites, Scheduled Monuments, Listed Buildings, and Registered Historic Parks, Gardens and Demesnes, and Conservation Areas.

2. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case scenario, than the decommissioning of the repowered wind turbines alone, should this be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

4. The assessment will be conducted with reference to the relevant statutory and planning frameworks for cultural heritage. In addition to those mentioned in the Planning and Policy Section (see **Section 4** of this Scoping Request), cognisance will also be taken of Planning Policy Statement (PPS) 6: Planning, Archaeology and Built Heritage (March 1999)[58] and the Strategic Planning Policy Statement for Northern Ireland (SPPS)[59] (September 2015).

5. At present, there is no specific Northern Ireland guidance for assessing archaeological effects; however, several government and professional organisations have established guidelines and best practice guidance relevant to assessing effects on archaeology and cultural heritage. These include:

- Standards and Guidance for Archaeological Desk-Based Assessments provided by the Chartered Institute for Archaeologists (CIfA)[60];
- Historic England's *The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning:3*[61]; and
- Historic Environment Scotland's *Managing Change in the Historic Environment: Setting*[62].

9.2 Suggested Methodology

6. A Desk-Based Assessment (DBA) of cultural heritage records in and around the Development, as shown alongside the Site Boundary in **Figure 9.1** of Appendix B, is underway and will be compiled to establish the baseline against which the impact assessment will be carried out. Data will be gathered from the following sources:

[58] Department of the Environment (1999) PPS 6: Planning, Archaeology and the Built Heritage. Available online at https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/pps06-archaeology-built-heritage.pdf [Accessed on 01/06/2017]

[59] Department of the Environment (2015) Strategic Planning Policy Statement for Northern Ireland (SPPS). Available online at https://www.planningni.gov.uk/index/policy/spps_28_september_2015-3.pdf [Accessed 01/06/2017]

[60] Chartered Institute for Archaeologists (December 2014, Updated January 2017) Standards and Guidance for Historic Environment Desk-Based Assessment. Available online at http://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_3.pdf [Accessed 01/06/2017]

[61] Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning: 3. Available online at https://content.historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/gpa3.pdf/ [Accessed 01/06/2017]

[62] Historic Environment Scotland (June 2016) Managing Change in the Historic Environment: Setting. Available online at https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes/ [Accessed on 01/06/2017]

- Department for the Communities' datasets including: Scheduled Historic Monument Areas, Areas of Special Archaeological Interest, Defence Heritage, Historic Parks and Gardens, Industrial Heritage Record, Listed Buildings, Northern Ireland Sites and Monuments Records, and Areas of Archaeological Potential;
- Cartographic Evidence as held by the Public Record Office of Northern Ireland (PRONI)[63];
- Contemporary Aerial Photography[64] as held by PRONI; and
- Local archives and libraries, as relevant.

7. A study area of 1 kilometre (km) around the Site Boundary, shown in **Figure 9.1** of Appendix B, will be used to collect data to inform on the archaeological potential of the Site.

8. The DBA will be augmented by a walkover survey to provide information on the archaeological potential of the Site, and to validate the documentary evidence. This fieldwork will be conducted to:

- Assess and validate documentary data collected;
- Identify the extent and condition of any visible archaeological remains; and
- Determine whether previously unrecorded historic features are visible.

9. Subject to the findings of the DBA, the requirement for and extent of any additional pre-determination surveys will be agreed , with an emphasis on avoiding direct effects on any known cultural heritage features through careful design of the Development including all infrastructure..

10. An assessment will be made of the potential indirect effects upon heritage assets and their setting including historic landscapes. The assessment will proceed from a consideration of the 'sensitivity' of a cultural heritage feature against the 'magnitude' of any potential change resulting from the Development, to arrive at the 'significance' of the effect. The assessment of sensitivity of archaeological and historical assets reflects the relative weight which statute and policy attach to them, principally as published in PPS6[58].

11. For the purposes of this document, designated heritage assets include World Heritage Sites, Scheduled Monuments, Listed Buildings, and Registered Historic Parks, Gardens and Demesnes as well as Conservation Areas; which have been considered out to a distance of 5 km from the Site Boundary (5 km Study Area). It is considered that the designated assets most likely to receive indirect effects are those that are located within the 5 km Study Area. These have been listed below (**Section 9.3**) and are shown on **Figure 9.1** of Appendix B.

12. This assessment will also take account of the extent of the potential visual impact as determined through the LVIA. The assessment may also include visual representations such as photomontages and / or wirelines, as appropriate.

13. Initial consultation has been undertaken with the Historic Environment Division of the Department for Communities and the Council with regards to the sourcing of baseline information. Consultation will be ongoing as part of the assessment process. The archaeology and cultural heritage assessment will include proposals for mitigation of any identified significant effects, where necessary.

9.3 Baseline

14. As part of the DBA, initial information relating to archaeology and cultural heritage has been gathered through a preliminary desk top records search using available online resources to indicate potential features of interest.

15. There are no designated cultural heritage features within the Site Boundary. An initial review of records held by the Northern Ireland Sites and Monuments Record (NISMR) database[65] shows that there is one non-designated heritage record (reference number: ANT 18:08) situated within the Site Boundary as shown in **Figure 9.1** of Appendix B. This record is for Kill

[63] PRONI Historical Map Viewer. Available online at https://www.nidirect.gov.uk/services/search-proni-historical-maps-viewer [Accessed 1/6/2017]
[64] *Ibid*

[65] Department for Communities. Northern Ireland Sites and Monuments Record (NISMR) Online Interactive Database: https://www.communities-ni.gov.uk/services/sites-and-monuments-record (Accessed on 04/04/2017)

Graveyard, an old disused graveyard that is not a statutory designation. It is located to the south west of the Operational Corkey Windfarm, north of the current operational access to the Site. The graveyard will be avoided as part of the site design process so that it will not receive a direct effect.

16. Preliminary record searches indicate that there are eight records of archaeological features within 1 km of the Site Boundary (1 km Study Area) (seven from the Sites and Monuments Record dataset and one from the Industrial Heritage dataset). These are detailed in **Table 9.1**.

Table 9.1: Recorded Archaeological Remains within the 1 km Study Area

Source Reference	Name and Description
ANT 18:08	Kill Old Graveyard
ANT 18:09	Standing Stone
ANT 18:24	Kilwee or Cill-Bhuide Settlement Site
ANT 18:26	Cist and Urn Burial (unlocated)
ANT 18:33	Souterrain
ANT 18:58	Souterrain
ANT 18:77	Liganiffrin Mass Site
IHR 6557	Carnamenagh / Drumrankin Bridge

9.4 Key Sensitivities

17. Preliminary desk studies indicate that there are no statutory designated heritage assets within the Site Boundary. Within the 5 km Study Area, there are no World Heritage Sites situated within the 5 km Study Area; however, there are ten Scheduled Monuments, 18 Listed Buildings, and one Historic Park, Garden and Demesne. These are detailed in **Tables 9.2, 9.3 and 9.4**. Due to their proximity to the Development, these are the assets considered most likely to receive a significant indirect effect upon their setting should they fall within the ZTV and should they receive open views of the Development. These will be subject to further assessment through the EIA process. **Figure 9.1** of Appendix B shows the location of these sites within the 5 km Study Area.

Table 9.2: Scheduled Monuments within the 5 km Study Area

Scheduled Monument Number	Name and Description
018:006	Raised Rath
018:015	Standing Stone
018:019	Motte and Bailey
018:085	Standing Stone
018:088	Standing Stone
018:095	Standing Stone
023:004	Graveyard and possible enclosure
023:005	Raised Rath
023:007	Raised Rath
023:015	Crannog

Table 9.3: Listed Buildings within the 5 km Study Area

Listed Building Number	Address	Use	Category
HB04/05/002	2 Corkey Road, Loughguile, Ballymoney, Co.Antrim	School	B1
HB04/05/004	121 Corkey Road, Corkey, Ballymena, Co.Antrim	House	B1
HB04/07/001	All Saints Church, Ballyveely Road, Castlequarter, Ballymena, Co.Antrim	Church	B
HB04/07/002	Lissanoure Cottage, 11 Knockahollet Road, Castlequarter, Ballymena, Co.Antrim	House	B
HB04/07/004	Killagan Bridge, Drumadarragh/Drumavaddy, Dunloy, Ballymena, Co.Antrim	Bridge	B2
HB04/07/005	Killagan Cottage, 49 Ballinaloob Road, Dunloy, Ballymena, Co.Antrim	House	B1
HB04/07/008	Checker Hall, 51 Ballyweeny Road, Ballyweeny, Corkey, Ballymena, Co.Antrim	House	B2
HB04/07/009	Conservatory and Garden House, Lissanoure, Castlequarter, Ballymena, Co.Antrim	Estate Related Structures	B
HB04/07/010	The Stables and Old Castle, Lissanoure, Castlequarter, Ballymena, Co.Antrim	Estate Related Structures	B1
HB04/07/011	The Gate Lodge, Lissanoure, 9 Knockahollet Road, Castlequarter, Ballymena, Co.Antrim	Gates/ Screens/ Lodges	B
HB04/07/012	Gazebo, Lissanoure, Castlequarter, Ballymena, Co.Antrim	Estate Related Structures	B
HB04/07/013	The Old Church (ruins), Lissanoure, Castlequarter, Ballymena, Co.Antrim	Church	B
HB04/07/014	Rectory, 74 Ballyveely Road, Castlequarter, Ballymena, Co.Antrim	House	B1
HB04/07/015	82 Ballyveely Road, Cloughmills, Co.Antrim	House	Record Only
HB04/16/001	Church of the Sacred Heart , Culcrum Road, Cloughmills, Co.Antrim	Church	B
HB04/16/002	Killagan Parish Church, 51 Drumadoon Road, Drumadoon Cloughmills, Co.Antrim	Church	B
HB04/16/006	Drumadoon house, 236 Frocess Road, Cloughmills, Co.Antrim	House	B2
HB07/01/016	Beetling Mill and component parts, Tullykittagh Road, Cloughmills, Co.Antrim	Mill	B1

Table 9.4: Historic Parks, Gardens and Demesnes within the 5 km Study Area

Park and Garden Reference	Name and Description
Historic Park, Garden and Demesne AN-049	Lissanoure

9.5 Scoped In Effects

18. Known archaeology will be avoided during site design, where possible. Direct effects upon other cultural heritage sites identified during the DBA (i.e. those not currently recorded within the NISMR) should they occur, will be assessed as part of the EIA. The assessment of physical effects will consider direct effects where sites or potential sites / buried archaeology are in danger of being disturbed or destroyed during the decommissioning / construction phase of the Development.

19. The assessment of indirect effects considers changes in setting which have the potential to affect heritage assets. For the purposes of evaluating indirect effects upon the setting of heritage assets, designation status and proximity to the

Development, where it is also falls within the Zone of Theoretical Visibility (ZTV), will determine whether further assessment is required. As such, nationally designated sites (e.g. Parks, Gardens and Demesnes, Listed Buildings and Scheduled Monuments) that are within the 5 km Study Area and the ZTV will continue to be assessed as part of the EIA at this stage, with the final list of assets requiring assessment, to be agreed during consultation.

20. For the purposes of the assessment of cumulative effects, only windfarm developments (operational, under construction, consented or application stage windfarms) within approximately 10 km of the Site Boundary will be considered. The potential for a significant cumulative effect is considered likely to occur only where the ZTVs for the Development and cumulative windfarms overlap, i.e. where each is theoretically simultaneously visible.

9.6 Scoped Out Effects

The baseline data presented in **Section 9.3** indicates that only one known archaeological site falls within the Site: ANT018:008 Kill Old Graveyard. This site is located just to the north of the existing access to the Operational Corkey Windfarm. This site will be avoided through site design and does not require assessment for direct effects within the Environmental Statement.

21. The assessment of indirect effects upon the setting of undesignated archaeology and cultural heritage assets is broadly based upon its designation status, or lack thereof. Undesignated sites are often of low sensitivity and therefore will not receive a significant indirect effect as defined by the EIA Regulations.

22. Nationally Designated Sites (Listed Buildings and Scheduled Monuments) that are not within the ZTV will not receive a significant direct effect upon their setting due to having no visibility of the Development. Those sites with/without visibility of the Development will be determined after final design, and agreed during consultation.

9.7 Key Questions for the Consultees

23. Key questions for the Council and Consultees are:

- Do the Consultees agree with the proposed methodology and scope of assessment?
- Do the Consultees have any information regarding current or recent archaeological work or projects being undertaken within or in the 5 km Study Area, particularly those whose results may not yet be recorded in the Northern Ireland Sites and Monuments Records?
- Are the Consultees aware of any further sites with statutory protection within the wider landscape whose settings may be affected by the Development?
- Do the Consultees have details of any cultural heritage sites in the vicinity of the Development which it considers may require further consideration within the EIA process?

10 Access, Transport and Traffic

10.1 Introduction

1. The Access, Traffic and Transport chapter of the Environmental Impact Assessment (EIA) will consider the effects of vehicle movements to and from the Development. Vehicle movements to the Development will consist of abnormal load vehicles (ALVs), heavy goods vehicles (HGVs), light goods vehicles (LGVs) and cars.

2. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case scenario, than the decommissioning of the repowered wind turbines alone, should this be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

4. Although the port of delivery and the associated route are not yet confirmed at this stage, either Larne or Belfast Ports are considered to the most appropriate facilities for the delivery of turbines. This information will be presented in the ES and the associated Abnormal Load Route Assessment (ALRA). This Scoping Request will outline the proposed methodology to be employed in the EIA of Access, Traffic and Transportation effects on the chosen delivery routes and on the wider road network.

5. During the decommissioning / construction phase which will include the decommissioning of the Operational Corkey Windfarm, a defined delivery route(s) from the port(s) of delivery will be used by ALVs carrying wind turbine components. The physical suitability of this route(s) will be assessed in the ALRA. Any improvement works required to allow safe passage will be defined. HGVs, LGVs and cars, used for delivery of other equipment, construction materials and for access by site personnel, may approach the site via a defined access route or from a variety of routes depending on the point of origin. A route for these vehicles presenting worst case parameters for the purposes of the assessment will be defined, this route may or may not be the same as that used by ALVs.

10.2 Suggested Methodology

6. In order to ensure a rigorous assessment, the following broad methodology will be employed:

- The worst case scenario assessment will be undertaken in which each potential route is assessed as if the total volume of traffic were to use it.

7. The assessment methodology will be based on 'Guidelines for the Environmental Impact of Road Traffic.'[66] A screening process, using two broad rules from these guidelines, will be employed to identify roads on which potential significant effects may occur. These are:

- Roads where traffic is predicted to increase by more than 30% a result of the Development, or where the number of HGVs is predicted to increase by more than 30% must be assessed; and
- Roads in specifically sensitive areas where overall traffic flow or HGVs are predicted to increase by more than 10% must be assessed.

8. Where the predicted increase is lower than threshold, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessment is not warranted.

[66] Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic.

9. It is worth noting that on roads where existing traffic levels are generally low (e.g., rural roads and some unclassified roads), any increase in traffic flow may result in a predicted increase that would be higher than the guideline thresholds. In these situations, it is important to consider any increase in terms of overall traffic flow in relation to the capacity of the road before making a conclusion in EIA terms.

10. Any change in traffic flow which is greater than the thresholds set out in the guidelines would be subject to further analysis to establish if the increased traffic flow is within the capacity of the road. In instances where traffic flow is higher than the IEMA (1993)[66] guideline thresholds but within the capacity limits of the road and the potential magnitude on receptors is minor or negligible, this increase would generally be considered to be not significant. It is acknowledged that capacities can be reduced by local conditions that cannot be accounted for within the relevant guidance such as temporary road works or road failure.

11. The Applicant does not propose to submit a formal Transport Assessment (TA) to accompany the planning application for the Development, as TAs principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function (e.g. retail parks). The potential for significant effects resulting from wind farm traffic are only likely to occur during the decommissioning / construction phase and are temporary, and therefore will not result in a permanent significant increase.

10.2.1 Magnitude of Effect

12. The magnitude of the effect of increase in traffic is a function of the existing traffic volumes on the surrounding highway network, the percentage increase associated with the proposed scheme and the changes in the type of traffic.

13. These guidelines are intended for the assessment of environmental effects of road traffic associated with major new developments giving rise to traffic generation, as opposed to short-term construction. In the absence of alternative guidance and, as the traffic generation during the operational phase is very low, these guidelines will be applied to assess the short-term construction phase of the Development.

14. **Table 10.1** shows the criteria to be employed to determine the magnitude of the effect of increase in traffic. The absolute increase refers to the change in number of vehicles per hour while the percentage increase refers to the change in number of vehicles per hour expressed as a percentage of the base traffic flows.

Table 10.1: Magnitude of the Effect of Increase in Traffic

Percentage increase (%) (Vehicles per hour of base traffic flows)	Absolute increase (Vehicles per hour)			
	< 30	30 - 60	60 - 90	> 90
< 5	Negligible	Negligible	Negligible	Negligible
5 – 10	Negligible	Low	Low	Low
10 – 20	Low	Low	Medium	Medium
20 – 30	Medium	Medium	High	High
> 30	High	High	High	High

10.2.2 Significance of Effect

15. The significance of effect will be determined by considering both the sensitivity of the receptors and magnitude of effects as shown in **Table 2.3** in **Section 2: Environmental Impact Assessment**. The receptors will be identified as the physical resource or user group that would potentially be affected by the Development, e.g. human being(s) and the transport network.

10.2.3 Cumulative Effects

16. In accordance with guidance, the assessment will consider the potential for any significant cumulative effects that may occur in combination with other consented, and/or in planning, traffic-generating developments that exist within the study area as these may generate traffic movements above the recorded baseline levels. Consultation will be undertaken with relevant authorities to establish where significant cumulative effects may occur, and with which developments.

10.2.4 Assessment of Effects

17. The determination of the significance of effects will be undertaken by reviewing the outline proposals for the Development, establishing the parameters of the road traffic that may cause an effect and quantifying these effects. The study will consider effects during the decommissioning / construction phase as follows:

- Define the most suitable route(s) of turbine delivery and other construction traffic to the Development, seeking to utilise the existing trunk road network, and avoiding settlements/sensitive receptors where possible;
- Consultation with the relevant highways authorities to identify constraints;
- Undertake an ALRA, or utilise historical assessments where appropriate, to define possible constraints to the delivery of ALVs to the site. This will include Swept Path Analysis, where required, to define locations where existing road alignments constrain the proposed delivery vehicles;
- Procure existing traffic data and arrange additional surveys where necessary;
- Undertake route inspections including detailed observations at each community potentially affected by the Development within the study area. We would provide general effects statements for major roads; however, the detailed and numeric assessment would be limited to the roads in closer proximity to the site;
- Based on the route inspections, sensitive receptors would be identified;
- An initial assessment of traffic generation from the Development, assignment of traffic to the network and an initial assessment of effects would be undertaken. This would be based on professional judgement rather than transportation network modelling. The Applicant will endeavour to utilise local sources of materials, wherever possible, to minimise traffic impacts;
- Obtain refined project needs, refine traffic generation, and reassess effects using obtained / gathered baseline traffic data;
- Assess residual effects, and any required residual mitigation needs; and
- Identify and assess the potential for cumulative effects based on other known developments.

10.3 Baseline

18. Baseline traffic flow conditions on routes within the vicinity of the Development will be established and detailed in the EIA. This baseline will include traffic from the Operational Corkey Windfarm. The geographic scope of the baseline assessment will be confirmed in consultation with the relevant authorities as appropriate. The worst case scenario will be defined and assessed.

19. Where publically available traffic count information is available, for example from Transport NI, then this will be used as the basis for baseline assessment. Where such information is not available then traffic surveys will be undertaken. Baseline traffic data will be factored to take into account traffic growth between the date of recording and the anticipated date of construction.

20. The vehicles servicing the Operational Corkey Windfarm have been doing so since 1994, and as such they form part of the existing baseline.

10.4 Key Sensitivities

21. The sensitivity of receptors will be determined based on the value of the affected resource and the extent of the area that might be affected by the Development. The receptor sensitivity is summarised as follows:

- High sensitivity refers to receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, retirement homes, residential roads without pedestrian or cyclist facilities, and accident black spots;
- Medium sensitivity refers to traffic flow sensitive receptors: congested junctions, community centres, parks, businesses with roadside frontage, recreation facilities;
- Low sensitivity refers to receptors with some sensitivity to traffic flows: public open spaces, nature conservation areas, listed buildings, tourist attractions, and residential roads with adequate footway provision, places of worship; and
- Negligible sensitivity refers to receptors with very low sensitivity to traffic flows; receptors that are sufficiently distant from the affected roads and junctions.

10.5 Scoped in Effects

22. The potential significant effects that are to be considered during the assessment are:

- Traffic Generation;

- Accidents and Safety;
- Driver Delay; and
- Pedestrian Amenity.

23. While initially considered within the assessment, the following potential effects may be scoped out based on the defined routes to the site:
    - Hazardous Loads;
    - Pedestrian Delay;
    - Visual Effects;
    - Air Quality;
    - Noise and Vibration; and
    - Severance.

10.6 Scoped Out Effects

24. The vehicles servicing the Operational Corkey Windfarm have been doing so since 1994, as such they form part of the existing baseline. Since the number of vehicles required to operate and maintain the Development, following its construction will be similar to those currently accessing the site, it is proposed to scope out operational traffic from the assessment as there is no anticipated increase to the baseline traffic flow, as such no significant effects are anticipated.

10.7 Key Questions for the Council

25. Key questions for the Council and Consultees are:

- Do the Consultees agree with the proposed methodology and scope of the traffic and transportation assessment; and
- Do the Consultees agree the operational traffic effects can be scoped out of the assessment?
- Are the Consultees aware of any specific access restrictions or limitations in the vicinity of the Site?
- Do the Consultees hold any information on any other developments, consented or in planning, where there may be potential for any significant cumulative effects to arise?

11 Hydrology, Hydrogeology, Geology, Soils and Peat

11.1 Introduction

1. This section details the proposed methodology with respect to effects on hydrology and hydrogeology, geology and soils and presents the suggested scope of the assessment in terms of those receptors to be scoped in and scoped out of the assessment process based on the baseline information and fieldwork undertaken to date. **Section 11.2** focuses on the hydrological aspects of the Development whilst **Section 11.3** details the geological and soils aspects including peat.

2. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case scenario for assessment purposes, than the decommissioning of the repowered wind turbines alone, should this be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

11.2 Hydrology and Hydrogeology

11.2.1 Suggested Methodology

11.2.1.1 Study Area

4. The hydrological and hydrogeological assessment will use a study area based on the downstream hydrological connectivity of water bodies to the Development, within a hydrological catchment of 10 km from the Site Boundary (the Study Area). At distances greater than 10 km, it is considered that developments of this nature are unlikely to have potential chemical or sedimentation effects, due to natural attenuation and dilution of potentially polluting chemicals and sediments in the water environment.

5. The study area for potential effects on public and private water supplies is defined as a 2 km radius of the Indicative Developable Area.

6. The following elements of work have been identified:

- Consideration of relevant guidance and good practice;
- Consultation with stakeholders;
- Desk-based study;
- Field Surveys; and
- Assessment of Effects.

7. It should be noted that a desk-based study and field surveys have been undertaken, the findings of these are presented in **Section 11.3**. The findings have been used to define which receptors will require assessment within the EIA process and effects which can be scoped out of the assessment at this stage.

11.2.1.2 Relevant Hydrology and Hydrogeology Guidance

8. The hydrology and hydrogeology assessment of the Development will be undertaken in accordance with good practice guidance (Guidance for Pollution Prevention (GPPs) and Pollution Prevention Guidelines (PPGs)), which includes:

- PPG1: General guide to the prevention of water pollution (July 2013);
- GPP2: Above ground oil storage tanks (January 2017);
- PPG4: Disposal of sewage where no mains drainage is available (July 2006);
- GPP5: Works and maintenance in or near water (January 2017);
- PPG6: Working at construction and demolition sites (2012);

- GPP8: Safe storage and disposal of used oils (July 2017);
- PPG18: Managing fire water and major spillages (June 2000);
- GPP21: Pollution incident response planning (July 2017); and
- PPG22: Incident response - dealing with spills (April 2011).

9. Other relevant guidance and regulation comprises the following:

- Planning Policy Statement (PPS) 18: Renewable Energy (NI Planning Service, 2009);
- The Construction Industry Research and Information Association (CIRIA) Report C689 Culvert Design and Operation Guide (2010);
- CIRIA Report C532 Control of water pollution from construction sites (2001);
- CIRIA Report C648 Control of water pollution from linear construction proposed developments: technical guidance (2006);
- CIRIA Report C741) Environmental Good Practice on Site Guide (2015);
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2006);
- PPS 15: Planning and Flood Risk (NI Planning Service, 2006);
- The Regional Development Strategy 2035 (RDS);
- Forest and Water, UK Forestry Standard Guidelines (Forestry Commission, 2011); and
- Best Practice Guidelines for the Irish Wind Energy Industry (Irish Wind Energy Association, Wind Skillnet, 2012).

11.2.1.3 Consultation

10. To identify key sensitive receptors and to gather environmental baseline data, consultation with NIEA, Northern Ireland Water, The Drinking Water Inspectorate (DWI NIEA), Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA NI) and Causeway Coasts and Glens Borough Council is underway.

11.2.1.4 Desk Study

11. An initial desk study has been undertaken to determine the baseline characteristics by reviewing available information pertaining to hydrology and hydrogeology. This includes a review of published geological maps, Ordnance Survey Northern Ireland (OSNI) maps and aerial photographs.

12. The desk study has identified sensitive receptors which may be potentially affected by the Development and has established the conditions of the hydrological and geological environment. The desk study findings are presented within **Section 11.2.3**.

11.2.1.5 Field Survey

13. Following the desk-based study, a site walkover was undertaken in June 2017 to verify the location and nature of watercourses and water bodies within the immediate hydrological catchment of the Site. The walkover recorded the presence / absence of hydrological features and focused on the Indicative Developable Areas shown in **Figure 2.1** of Appendix B.

14. In addition, dipwells have been installed at 29 locations across the Site to monitor near surface water levels within the peat onsite. The dipwells will be monitored at regular intervals under a variety of conditions and the results will inform the assessment of potential hydrological effects upon the peat resource.

11.2.2 Assessment of Effects

An assessment of the potential risks and effects to the hydrological environment throughout all stages of the Development on receptors will be made using professional judgement and a source-pathway-receptor model. The significance of the potential effects of the Development will be classified by taking into account the sensitivity of the receptor and the magnitude of the potential effect. The following will be undertaken as part of the assessment:

- Preparation of a catchment plan;
- Identification of key sensitive receptors, including: surface and ground water features, catchments; Groundwater Dependent Terrestrial Ecosystems (GWDTEs), active peatlands, public and private water supplies;
- Avoidance of effects through the design process by utilising buffers of 50 m from natural watercourses and 20 m from man-made drains of greater than 0.5 m depth and width. Drains of less than 0.5 m in depth and width are not considered

to form a constraint to development, as they can be redirected and managed through good construction practice, which will ensure the baseline flow conditions are maintained;
- Identification of, and cumulative assessment of, other similar developments, either built, consented or in planning within the Study Area;
- Collation of flood plain information, water quality data and groundwater vulnerability information;
- Risk assess the potential effects of the Development on key sensitive receptors throughout all phases of development to inform a statement of significance in accordance with the EIA Regulations; and
- Provision of an outline Water and Construction Management Plan (WCMP).

15. The outline WCMP will be included as part of the embedded Development design. The WCMP will comprise methods and works that are established and effective measures to which the Applicant will be committed to through an appropriately worded planning condition. Therefore, the assessment of potential significance of effects arising from the Development will be carried out assuming that the measures outlined within the WCMP are inbuilt.

11.2.3 Baseline

16. An initial review of the River Basin Management Plan (RBMP) data indicates that there are two classified water bodies within the Study Area, which will need to be considered during the design iterations and EIA process, namely the Killagan Water and the Bush River.

17. The Site is located in the overall catchments of the Killagan Water which is in the Neagh Bann River Basin District and the Bush River, which is located in the North Eastern River Basin District. Killagan Water bisects the Site Boundary in the southwest, and minor watercourses within the Site connect to the Kilagan Water. Bush River is located approximately 1.2 km northeast of the Site Boundary at its nearest point.

18. Aghanageeragh River, which drains into Cloughmills Water is located approximately 1.1 km southeast of the Site Boundary. The Site includes two areas within the catchment of Aghanageeragh River and subsequently Cloughmills Water. However, given the distance between the Site Boundary and the watercourses, it is unlikely that potential significant effects will occur on this watercourse. This will be confirmed upon the final layout design.

19. The Killagan Water is classified as having moderate overall status while the Bush River is classified as having good overall status.

20. Bush Reservoir is located approximately 1.3 km to the northeast of the Site Boundary but is hydrologically disconnected from the Site by Flisk Burn. As such, there is no likelihood of potential significant effects on Bush Reservoir, effects on this waterbody will therefore be scoped out of the EIA at this stage.

21. The groundwater body under the majority of the Study Area is classified by the DAERA NI as having 'Poor' Bedrock Overall Status. The Hydrogeological map of Northern Ireland identifies the bedrock underlying the Site as Tertiary Basalts which are locally important aquifers. Consultation with DAERA NI will identify groundwater vulnerability and aquifer productivity, which will inform the EIA process and design of the Development.

22. An initial desk-based review shows that there are areas of peat located within the Site. It is therefore highly likely that Ground Water Dependent Terrestrial Ecosystems (GWDTEs) will be present, and field surveys have therefore already been undertaken in conjunction with an ecologist to confirm the presence and condition of this receptor.

23. Flood Maps (NI) show that the Site is located outside floodplains for river and coastal flooding. A minor unnamed tributary of Flisk burn, in the northeastern section of the Site, is identified as floodplain within the immediate area surrounding the watercourse. As a buffer has been applied to watercourses during the design phase, no infrastructure will be located within this area. As such, a concise section within the ES will consider how the Development may impact surface water run-off and effects on offsite receptors, in accordance with PPS 15: Planning and Flood Risk[67].

[67] Department for the Environment Northern Ireland (2006). Planning Policy Statement 15: Planning and Flood Risk. Available online at: https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/pps15-flood-risk.pdf [Accessed on 05/07/2017]

24. Consultation with Causeway Coasts and Glens Borough Council, Northern Ireland Water and local landowners is ongoing to identify all public and private water supplies within this area. Consultation responses are yet to be received. Each water supply will be assessed to determine if any potential significant effects are likely to occur as a result of the Development.

11.2.3.1 Field Surveys

25. Only two natural watercourses are present within the Site, which drain south west to north east. The watercourses are culverted by twin 300 millimetre (mm) circular concrete culverts under the existing access track serving the Operational Corkey Windfarm. Low flow conditions were observed within the watercourses, despite prolonged and persistent rainfall during the site walkover.

26. An extensive network of anthropologically made drainage ditches and peat cuttings were observed within higher ground in the southern section of the Site, with standing water observed within the ditches, suggesting that the peat and superficial geology in these areas is well drained.

27. Watercourses in the west and south west of the Site, approximately 1.2 km north of Moneyneagh, originate from marshy areas and morphology is typical of upland watercourses, which are generally evenly dispersed through flat boggy ground from their upper reaches, becoming increasingly steep and faster flowing as they progress downstream to the primary rivers.

28. Baseline hydrochemistry data was obtained from the unnamed tributaries of Killagan Water in proximity to Drumrankin Bridge as the tributary exits to the west of the Site, by taking manual spot samples using a hand held water quality meter. The data suggests these watercourses are typical of upland rural areas i.e. of good water quality with parameters within the expected ranges. Water quality information collected as part of the hydrological walkover will be provided for use in the Fisheries Assessment.

29. The site visit also confirmed that one turbine associated with the Operational Corkey Windfarm is located approximately 25 m from a watercourse. This will be assessed as part of the decommissioning / construction phase of the Development.

11.2.4 Key Sensitive Receptors

30. The following key sensitivities receptors have been identified through desk-based research and a field visit,:

- River Bush;
- Killagan Water;
- Bedrock and localised aquifers;
- Peat and active peat identified during the ecologists visit on the 28th of March 2017;
- Private and public water supplies (to be confirmed, response awaited on data request);
- Natural surface water drainage patterns; and
- Groundwater levels and groundwater movement.

11.2.5 Scoped In Effects

The following effects will continue to be considered within the EIA at this stage:

- Chemical pollution;
- Sedimentation as a result of the decommissioning / construction phase;
- Acidification of watercourses;
- Impediments to watercourse and near-surface water flow;
- Increased run-off and flood risk;
- Migration of pollutants from contaminated land / previously developed areas;
- Compaction of superficial deposits; and
- Consideration of impact on groundwater table and flow paths from decommissioning of existing infrastructure.

11.2.6 Scoped Out Effects

31. Receptors beyond the 10 km Study Area will not be considered further, as beyond this distance, it is considered that developments of this nature are unlikely to have potential chemical or sedimentation effects, due to natural attenuation and dilution of potentially polluting chemicals and sediments in the water environment.

32. Additionally, as Bush Reservoir is hydrologically disconnected from the Site by Flisk Burn, potential effects on the reservoir will be scoped out of the EIA at this stage.

33. Should no public or private water supplies be identified within 2 km of the Site then effects on this receptor will be scoped out.

11.3 Geology, Soils and Peat

34. The purpose of the geology and soils assessment will primarily be to:

- Identify any areas susceptible to peat slide, using peat thickness and digital terrain model (DTM) data to analyse slopes;
- Support the identification of active and inactive peatlands;
- Assist in the design process for turbines and other infrastructure to guide infrastructure to areas of no peat, shallow peat or inactive peatlands;
- Assess potential effects on soils, peat and underlying geology; and
- Develop an acceptable code for working within the Site that will adopt best practice procedures, effective management and control of onsite activities to reduce or offset any detrimental effects on the geological, hydrogeological and hydrological environment.

11.3.1 Suggested Methodology

35. It has been recognised that the design of the Development is likely to be affected by the presence of peat, both as a physical consideration in terms of stability and engineering properties, and as a habitat resource. Active peatland is identified as a priority habitat in accordance with the EC Council Directive 92/43/EEC Conservation of Natural Habitats and Wild Fauna and Flora (the Habitats Directive) which is implemented by law in Northern Ireland through Article 3 of the Planning (Northern Ireland) Order 1991 and Planning Policy Statement 18, August 2009 by Department of the Environment (DOENI)[68].

36. It was established that site surveys would take place at a pre-scoping stage to ascertain the extent and nature peat within the study area and develop a robust investigation approach suitable to the identification of these characteristics. Initial desk based researches and co-ordination with the project ecologist defined extents of active, possibly active and not-active peat. This approach informed an enhanced Phase 1 peat probing and National Vegetation Classifications (NVC) survey, this is discussed in **Section 6: Ecology**.

37. The principles of the enhanced Phase 1 study are:

- To collect site data that is robust and auditable, and that permits assessment;
- To undertake an assessment of baseline (existing) conditions based on an agreed methodology; and
- Permit an EIA to be undertaken that appropriately addresses the peat resource, and allows viable embedded mitigation and good design in relation to active peatlands.

11.3.1.1 Enhanced Phase 1 Peat Study

38. Acknowledging the influence that peat classification will have on Development design, the enhanced Phase 1 peat depth survey has been completed and the extent of survey has been based on the initial NVC assessment to ensure the scope is aligned as closely as practicable to baseline conditions. The classification details are covered in **Section 6.2.3.**

39. Based on the initial NVC assessment, the enhanced peat survey was undertaken as follows:

- Likely active peat areas: Probes at 50 m spacing at boundary with possibly active peat/transition zones and further probes within the active peat zone for verification;
- Possibly active peat: 50 m peat probe and inspection grid; and
  Not active peat: 100 m peat probe and inspection grid.

68 Department of the Environment Northern Ireland (2009) accessed at: https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/planning_policy_statement_18__renewable_energy.pdf

40. The enhanced Phase 1 peat depth survey included a visual inspection of characteristics at or adjacent to each probe location, a photographic record, and the following data was recorded:

- Peat depth;
- Proximity to shallow (less than 0.3 m) or deep (greater than 0.3 m) surface water drainage;
- Presence of common cottongrass (*Eriophorum angustifolium*) abundant, little or absent;
- Presence of harestail cottongrass (*Eriophorum vaginatum*) abundant, little or absent; and
- Presence of sphagnum *(Sphagnum sp.*) abundant, little or absent.

41. Furthermore, 29 dipwells have been installed across the Site to monitor near surface water levels within the peat onsite. The dipwells will be monitored at regular intervals under a variety of conditions and the results will inform the assessment of the hydrological characteristics of the peatland by sub area. Locations for the dip wells were selected on the basis of peat thickness, phase 1 habitats and presence of any notable surface drainage features.

42. Surveys undertaken to date will be utilised to inform design constraints which will be supplemented by Phase 2 peat probing as required by the design. The likely active peat areas identified have contributed to the Indicative Developable Areas (shown on **Figure 2.1** of Appendix B) and are considered as a constraint based on their protection under PPS18. Given that existing infrastructure may be used / adapted as part of the design, Phase 2 peat probing could capture more detailed information required in the vicinity of the infrastructure.

11.3.1.2 Phase 2 Peat Study

43. Following design freeze, the Phase 2 peat study will be undertaken along the site infrastructure at 50 m centres as well as at 5 - 10 m centres at each turbine location. This approach is in accordance with 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments' (Scottish Government, 2007) and 'Guidance on Developments on Peatland - Site Surveys' (Scottish Government, 2014).

44. The probing rationale during phase 2 may require to be more densely spaced in areas of potentially active peat and to allow for appropriate design and to inform any micro-siting requirements during the construction phase.

11.3.1.3 Peat Condition Assessment

45. If required, during Phase 2 peat probing, a selection of core sample locations will be taken to provide a full peat depth profile. This will be achieved by taking 50 cm cores from the surface layer through to the basal layer. A record of each core will be kept and will include, but not be limited to the following information:

- Photograph of each core;
- Depth of acrotelm layer;
- Degree of humification;
- Course and fine fibre content;
- Water content; and
- Information on the water table and the average soil pH level.

46. In the absence of published guidance specific to Northern Ireland, this approach is consistent with the document 'Good Practice During Windfarm Construction' produced by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA), Forestry Commission Scotland and Historic Environment Scotland, (Scottish Renewables *et al.,* 2015)[69].

11.3.1.4 Peat Slide Risk Assessment

47. Should significant quantities of peat be present within the Site, a peat slide risk assessment will be undertaken in accordance with Scottish Government guidance and 'Guidance on Developments on Peatland - Site Surveys' Scottish Government, 2014' along with full consultation with the relevant bodies.

[69] Scottish Renewables, SNH, SEPA, Forestry Commission Scotland and Historic Environment Scotland (2015). Available online at: http://www.snh.gov.uk/docs/A1168678.pdf [Accessed on 02/08/2017]

48. The Peat Slide Risk Assessment will comprise of detailed analysis and reporting on the design freeze and will include a hazard and slope stability assessment and preliminary peat management.

49. In accordance with the 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments', Scottish Government (January 2007), the hazards existing on the Site be ranked based on factors that influence stability, namely peat depth and slope gradient. In addition, potential receptors exposure to risk will be established and hazard rankings applied across the Site, with management and mitigation measures recommended for an acceptable construction.

11.3.1.5 Peat Management Plan

50. An outline Peat Management Plan (PMP) will be prepared, if necessary, to inform the Council and statutory consultees of the proposed materials management methodologies to be employed during construction. The purpose of the PMP is to:

- Detail proposals for the management of peat and soils;
- Define the materials that will be excavated as a result of the Development, focusing specifically on the excavation of peat;
- Report detailed investigations into peat depths within the Site;
- Consider the potential impact of the Development on active peat and other sensitive habitats;
- Determine indicative volumes of excavated arisings, and proposals for depositing any surplus materials; and
- Detail management techniques for handling, storing and depositing peat for reinstatement.

51. In the absence of specific Northern Irish guidance associated with the excavation and management of peat and peaty soils, the PMP will be produced in accordance with Scottish Renewables and SEPA guidance on peat excavations and management and in line with relevant guidance including 'Good Practice during Windfarm Construction' published in 2010 by Scottish Renewables, SNH, SEPA and Forestry Commission and 'Developments on Peatlands, Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste' published in 2012 by Scottish Renewables and SEPA.

52. An assessment of excavated material based on probe data from surveys will be undertaken to allow a determination of likely volumes which will be created during the construction process. An assessment of peat excavation will be included to determine possible re-use of materials, to minimise excavation and to avoid sensitive areas of deep peat, will they exist. The output from this element will be a peat management statement which will inform various chapters within the ES including project design, ecology, hydrology and carbon savings assessments.

11.3.2 Baseline

11.3.2.1 Desk Study

53. The available online Geological Survey of Northern Ireland (GSNI)[70] information indicates the majority of the Site to be underlain predominantly by peat with glacial till underlying the western areas. Peat is identified within the vicinity of the Operational Corkey windfarm infrastructure and is predominant on the Eastern face of Slievenahanaghan. Peat should be anticipated in low lying topographic areas.

54. The underlying bedrock was indicated to belong mainly to the Lower Basalt Formation comprising Paleocene aged Basalt. Within the Site, localised areas were recorded to belong to the Upper Basalt Formation and Interbasaltic Formations, comprising Basalt and Bauxites respectively. Shallow rock is anticipated in the upland slopes.

55. The geological assessors will liaise closely with the project ecology and hydrogeological/hydrology specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

11.3.2.2 Field Survey

56. The extent of probing and peat depths recorded from the Phase 1 surveys is shown on **Figure 11.1** of Appendix B. In summary, peat was generally thinner in the northern portion of the Site, varying between 0 and 1.0 m while within the vicinity

[70] Geological Survey of Northern Ireland, Available online at: http://mapapps2.bgs.ac.uk/GSNI_Geoindex/home.html [Accessed on 23/06/2017]

of the existing windfarm infrastructure, and easterly and southerly zones of the Sites, peat depths were generally thickest, varying between 1.0 m and >1.50 m. Peat thinned in the western area of the Site towards the face of Slievenahanaghan. The findings were fairly consistent with the published GSNI mapping (see **Section 11.3.2.1**).

11.4 Scoped In Effects

57. The potential effects that are to be considered during the assessment are **:**

- Potential peat slide risk;
- Inform the assessment of active peatlands;
- Excavations and Management of peat and peaty soils; and
- Details of embedded mitigation and restoration relative to peatlands.

11.5 Scoped Out Effects

58. It is proposed that a full detailed peat assessment will be undertaken for the Development including peat slide risk and therefore no peat elements will be scoped out from the assessment.

11.6 Key Questions for Consultees

59. Key questions for the Council and Consultees are:

- Do Consultees agree with the proposed methodology and scope of the hydrology and hydrogeology assessment?
- Do Consultees agree with the elements proposed to be scoped out of the EIA?
- Are Consultees content with the proposed approach to the Phase 1 and Phase 2 peat probing surveys?
- Do the Council and NIEA or other consultees have any information that would be useful in the preparation of the geology, hydrology, hydrogeology and soil assessment?
- Do Consultees agree with the identified policy, guidance and methods to be used as the basis of assessment?

12 Tourism, Recreation and Socio-Economics

12.1 Introduction

1. The aim of the Tourism, Recreation and Socio-Economics assessment is to identify and evaluate the likely effects of the Development on these resources. As there is a direct correlation between tourism and recreational use, these are discussed together whilst socio-economics is addressed separately.

2. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

3. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would have a greater effect than if the two processes were to arise at different times. This represents a worst case scenario, than the decommissioning of the repowered wind turbines alone, should this be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

12.2 Tourism and Recreation

12.2.1 Suggested Methodology

4. Tourism and recreation effects will be considered based on the guidance from Guidelines for Environmental Impact Assessment[71] and a Handbook for EIA[72] and consider

- Tourism and recreation;
- Land-use and ownership; and
- Public attitudes to wind farms.

5. An assessment of effects upon tourism and recreational resources will be undertaken, taking into account published data on visitor numbers and the value of tourism to the economy of the area. For this, a two tiered approach will be adopted. Firstly, an assessment of any potential significant effects on community receptor sites and tourism orientated attractions will be undertaken within a 10 km study area (Study Area) of the Site Boundary, as shown in **Figure 2.1** of Appendix B. Secondly, the assessment will consider any influential community and tourism receptors outside of the Study Area which have the potential to be significantly affected.

6. Consultation will take place with the following consultees to assess the effects to users of recreational routes:

- The Access Officer at the Council;
- Northern Ireland Tourist Board;
- Sustrans (Northern Ireland); and
- Outdoor Recreation Northern Ireland.

7. Various existing surveys and assessments of socio-economic and visitor profiles, land use and ownership, and public attitudes to wind farms will be collated to provide background information against which to assess the potential for significant effects.

12.2.2 Baseline and Key Sensitivities

12.2.2.1 Local Tourism and Recreation Receptors

8. Initial information on tourism and recreation has been gathered through a preliminary desk top search using available online resources to identify potential receptors. These are detailed in **Table 12.1.**

[71] Institute of Environmental Management and Assessment (IEMA) (2004) Guidelines for Environmental Impact Assessment (IEMA)
[72] SNH (2003) A Handbook for Environmental Impact Assessment, Appendix 5: Guide to Outdoor Access Assessment, SNH.

9. Should further receptors be identified within the Study Area, as part of the ongoing desk based assessment and consultation process, these will be considered in terms of direct and indirect effects.

10. Indirect effects on any tourism or recreation receptor derive from the visual impact of the Development on that receptor, together with the receptors sensitivity to change. Therefore, the findings of the LVIA, including the findings of the cumulative assessment will be used to inform the assessment of effects on the identified receptors.

Table 12.1: Local Tourism and Recreation Receptors

Tourism and Recreation Resource	Amenities	Location	Direct Effect	Indirect Effect
Slieveanorra Forest	Walking, Altnahinch Dam, Orra Mountain, Trostan Hill	2.5 km east of the Site	No direct effect	Potential visual effects on this receptor will be considered and informed by the findings of the Landscape and Visual Impact Assessment..
Glenariff Forest Park	Outdoor activities such as walking, horse riding and caravanning as well as picnic and barbeque facilities.	9 km south-east of the Site and covers an area of approximately 1,000 hectares	No direct effect	Indirect significant effects are unlikely to arise as a result of the Development due to distance and the lack of visibility from the Forest Park as shown on **Figure 5.4** of Appendix B.
Causeway Coast and Glens	Giant's Causeway, Carrick-a-Rede Rope bridge, Dunluce Castle, Old Bushmills Distillery and Mussenden Temple and Downhill Demesne.	Along the northern coastline at a distance greater than 15 km from the Site	No direct effect	Indirect significant effects are unlikely as a result of the distance from the Development, and the lack of visibility as shown on **Figure 5.4** of Appendix B.
Moyle Way (part of the Ulster Way) (Ballycastle to Waterfoot)	Walking route	3 km east of the Site within Slieveanorra Forest at its closest point	No direct effect	Despite the limited extent of visibility shown in the ZTV (**Figure 5.4** of Appendix B), the close range of this route makes it susceptible to the effects of the Development and views from this route and the visitor experience will be considered further.
Croaghan Way (Circular Route)	Walking route	6.2 km north-east of the Site in Breen Forest	No direct effect	Indirect significant effects are unlikely due to the distance between the Development and the receptor. This route lies to the north of the Development with only a small section receiving visibility of the Development as shown in the ZTV (**Figure 5.4** of Appendix B) as such it has been scoped out.

12.2.3 Scoped In Effects

12. Effects on the identified receptors effects namely Slieveanorra Forest and Moyle Way will be considered further as part of the EIA process.

13. Should further receptors be identified as part of the ongoing desk based assessment and consultation process these will be considered further, and may be scoped out of further assessment, should the receptor receive no visibility of the Development or no significant visual effects.

12.2.4 Scoped Out Effects

14. It is anticipated that there will be no significant direct effects upon tourism and recreation as a result of the Development, as there are no tourism and recreation receptors within the Site. Therefore, direct effects upon the tourism and recreation receptors have been scoped out of the EIA and will not be included within the ES.

15. Indirect effects upon Glenariff Forest Park, Causeway Coasts and Glens and the Croaghan Way will be scoped out of the assessment.

12.3 Socio-Economics

16. A desktop socio-economic assessment will consider the potential direct and indirect effects of the Development.

12.3.1 Baseline and Key Sensitivities

17. Socio-economic and census data indicates that there is a resident population of approximately 142,303 in the Causeway Coasts and Glens area[73]. Recent population growth in this area has been significantly lower than the Northern Ireland average, with an increase of 1.9% compared to 6.6%[74]. Currently, there is a 66% employment rate in the Causeway Coast and Glens area with 27% economically inactive. The largest employment sectors for the region includes distribution services, production and other services, with 12% of the population employed within the tourism trade[73]. In 2013, the energy sector in Northern Ireland employed 2,200 people and the number of energy sector enterprises has increased by 86% between 2010 and 2014[75].

18. The Operational Corkey Windfarm is consented in perpetuity and repowering the site with more efficient machines, alongside potentially installing battery storage systems, will help to drive down the overall cost of energy, bringing wider economic benefits to consumers in Northern Ireland.

19. Wind farms can have positive economic benefits on local communities by contributing to local benefit funds as well as providing employment and income by employing local contractors and employees. The Applicant currently employs a number of local companies involved in the maintenance of the Operational Corkey Windfarm. As part of the repowering in support of the construction phase the Applicant would typically hold “Meet the developer days” whereby local firms are invited to meet the Applicant and lead contractors, and discuss opportunities to tender for work on the project, thus investing in the local economy.

20. During the proposed construction phase (and post completion), there will be further requirements for a wide range of services and possible job opportunities in a range of areas such as turbine service and maintenance, waste management, grounds and roads maintenance, and the servicing and maintenance of operational buildings. The Applicant is committed to working with local companies in the procurement of such support.

21. The Applicant is keen to integrate themselves into the communities in which the windfarms operate. The Applicant is committed to working closely with the communities to maximise the opportunities for local businesses including through the

[73] Invest Northern Ireland (2016) *Causeway Coast & Glens Council Area Profile.* Available online at: https://secure.investni.com/static/library/invest-ni/documents/a-desktop/council-area-profile-causeway-coast-and-glens.pdf [Accessed on 05/07/2017]
[74] Causeway Coasts and Glens Borough Council (2015) Discussion Paper 1: Population and Growth. Available online at*:* https://www.causewaycoastandglens.gov.uk/uploads/general/Topic_Paper_1_-_Population_and_Growth.pdf [Accessed on 05/07/2017]
[75] Department of Enterprise, Trade and Investment (2016) *Energy in Northern Ireland 2016*. Available online at: https://www.economy-ni.gov.uk/sites/default/files/publications/deti/energy-northern-ireland-2016.pdf [Accessed on 05/07/2017]

provision of a community benefit package which will be discussed and agreed with local community via the consultation process.

22. No significant negative economic effects will occur as a result of the Development, a Socio Economic Assessment setting out the positive economic effects of the Development, against the wider context of renewables, in Northern Ireland will be provided as an Appendix to the ES. This report will consider how the Development relates to sustaining and building on job opportunities in the renewables sector, the continued support and creation of a skills base, and considers the wider benefits of being at the forefront of emerging technology and innovation, and will focus on how the Development contributes to the local economy.

12.4 Scoped In Effects

23. Both direct and indirect effects upon socio-economics will be considered further as part of the EIA process.

12.5 Scoped Out Effects

24. No Aspects of the Socio Economics Assessment will be scoped out.

12.6 Key questions for the Consultees

25. Key questions for the Council and Consultees are

- Are Consultees aware of any additional key sensitive tourism and recreation receptors that should be taken into account?
- Are the Consultees aware of any additional data sources to inform the socio-economic assessment? and
- Are Consultees aware of any additional relevant consultees not accounted for above?

13 Other Issues

1. A number of miscellaneous issues have been considered within this Section. It is not expected that there will be significant effects on these however, where required, they will be considered further as part of the EIA process with a view to scoping out many of the topics via consultation with the relevant consultees and stakeholders.

2. This section considers the following topics:

- Telecommunications and Utilities;
- Shadow Flicker and Reflectivity;
- Aviation and Radar;
- Human Health;
- Climate Change; and
- Waste.

3. The assessment will consider the potential effects of the Development during the following development stages:

- Dismantling and removal (decommissioning) of the Operational Corkey Windfarm;
- Construction of the Development; and
- Operation of the site in perpetuity.

4. The decommissioning of the Operational Corkey Windfarm and the construction of the Development is likely to occur partly in tandem and would be worse than if the two processes were to arise at different times. This represents a worst case assessment scenario, than the decommissioning of the repowered wind turbines alone, should this be required. Therefore, the decommissioning of the Development is not considered further within this assessment.

13.1 Telecommunications and Utilities

5. Windfarms have the potential to interfere with electro-magnetic signals passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities. To identify any existing infrastructure constraints, both consultation and a desk based study is underway. Consultation has already been undertaken with a number relevant telecommunication and utilities providers including:

- Spectrum Licensing (OFCOM);
- Television and telecommunications providers as appropriate; and
- Water, gas and electricity utilities providers.

6. **Table 13.1** summarises the responses received to date. Other additional information obtained from consultation will be used to inform the design process.

Table 13.1: Telecommunications Consultation Carried Out to Date

Consultee	Number of Links	Response
Police Service of Northern Ireland	1	Unlikely to have an impact, but will reassess on provision of proposed turbine co-ordinates
Northern Ireland Water Ltd	1	Unlikely to have an impact, but will reassess on provision of proposed turbine co-ordinates
Joint Radio Company (JRC)	6	Request an exclusion zone of 500 m around most base sites, 500 m – 1 km separation required of all links.

7. From the information provided to date and shown on **Figure 13.1** of Appendix B, two of the JRC links originate from within the Site; one associated with the Operational Corkey Windfarm, which will no longer be used following the decommissioning of the substation, and the other JRC link associated with a privately owned single turbine located to the north of the Site. The remaining four links are located at least 1 km from the Site centre and, as such, it is unlikely that the Development will affect the operation of these links.

13.1.1 Scoped In Effects

8. Further consultation will be carried out with the JRC, Police Service of Northern Ireland and Northern Ireland Water following confirmation of the candidate turbine and final layout. Should any effects be identified at this stage the design of the Development will take these into account in order to ensure there is no significant effect. It is therefore anticipated that any concerns raised by consultees can be adequately addressed through design and that this element will be scoped out of the ES.

9. At the time of writing consultation with infrastructure providers had not been concluded, once all information from the providers has been collated it may be possible to scope out effects on television and other infrastructure.

13.1.2 Scoped Out Effects

10. All telecoms links beyond stated buffer distances set out in **Table 13.1** will be scoped out of the assessment.

13.2 Shadow Flicker and Reflectivity

11. In the UK, the shadow flicker effect has the potential to occur within 130 degrees either side of north relative to the turbine positions, as turbines do not cast long shadows on their southern side. It is also known that the effect is only likely to occur within 10 rotor diameters. Careful site selection, design and planning can help to avoid the possibility of shadow flicker in the first instance.

12. Guidance presented within the Best Practice Guidance to PPS18: Renewable Energy[76] describes shadow flicker as an effect that:

13. *"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; the effect is known as 'shadow flicker'. It only occurs inside buildings where the flicker appears through a narrow window opening. A single window in a single building is likely to be affected for a few minutes at certain times of the day during short periods of the year. The likelihood of this occurring and the duration of such an effect depends upon:*

- *the direction of the residence relative to the turbine(s);*
- *the distance from the turbine(s);*
- *the turbine hub-height and rotor diameter;*
- *the time of year;*
- *the proportion of day-light hours in which the turbines operate;*
- *the frequency of bright sunshine and cloudless skies (particularly at low elevations above the horizon); and,*
- *the prevailing wind direction.*

14. *Problems caused by shadow flicker are rare. At distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low. The seasonal duration of this effect can be calculated from the geometry of the machine and the latitude of the site. Where shadow flicker could be a problem, developers should provide calculations to quantify the effect and where appropriate take measures to prevent or ameliorate the potential effect, such as by turning off a particular turbine at certain times.*

15. *Careful site selection, design and planning, and good use of relevant software, can help avoid the possibility of shadow flicker in the first instance. It is recommended that shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year or 30 minutes per day".*

16. The assessment of potential shadow flicker effects will be undertaken following the careful design of the Development and will follow the methodology described below.

[76] Department of the Environment (2009) Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy. Available online at https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/planning_policy_statement_18__renewable_energy__best_practice_guidance.pdf [Accessed on 27/06/2017]

17. Reflectivity is the potential for the sun to 'glint' off structures which, in the case of wind turbines, can be an intermittent glint when the turbines are rotating. This effect can be minimised by selecting a matt coating for the wind turbines, designed to reduce the potential for reflection. It is therefore proposed to scope reflectivity out of the EIA at this stage.

13.2.1 Suggested Methodology

18. An assessment will be undertaken to determine whether or not there will be any impacts on surrounding properties. This will examine all properties which lie within 10 rotor diameters and 130 degrees either side of north from each turbine. Aerial imagery will then be reviewed to ascertain the orientation of the properties that fall within this area. Resoft WindFarm, a computer modelling programme, will be used to model the potential effects at surrounding properties to quantify them, should this initial assessment predict a likely significant effect then a full assessment will be included within the ES.

13.2.2 Scoped In Effects

19. Since the layout of the Development and the candidate turbine have not yet been finalised, it is proposed to carry out a Shadow Flicker assessment on any properties lying within ten rotor diameters of the turbine positions within 130 degrees of north with windows facing on to the Development.

20. Should no properties lie within ten rotor diameters, this will be confirmed within the ES.

13.2.3 Scoped Out Effects

21. All aspects of the assessment relating to reflectivity. The turbines will be painted a semi matt pale grey in accordance with best practice and conditions prescribed by the determining authority.

13.3 Aviation and Radar

22. The operation of wind turbines has the potential to cause a variety of adverse effects on aviation during turbine operation. These include but are not limited to:

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

23. The Site is approximately 40 km north of Belfast International Airport (BFS), over 50 km northwest of Belfast City Airport and over 50 km east of City of Derry Airport, the three major airports in Northern Ireland. The turbines of the Operational Corkey Windfarm are within radar line of sight of BFS's PSR, and have been accommodated to date by both the airport and National Air Traffic Services En Route Plc (NATS) which also uses the BFS radar. The Operational Corkey Windfarm is not in radar line of sight of Belfast City Airport's radar while the City of Derry Airport does not currently have radar facilities. Following confirmation of the final Development layout and turbine type, consultation will be undertaken with these airports however no objections are anticipated.

24. There are no active Royal Air Force (RAF) bases within 50 km of the Site and there are no operational airfields within a 20 km radius of the Development. The Development is located within a little used Ministry of Defence (MoD) low flying area and the turbines of the Operational Corkey Windfarm are being accommodated. The MoD will be consulted during planning but no objection is anticipated. It is noted that the MoD may request some infra-red turbine lighting to be installed on the turbines as part of the Development. While it is possible that visible obstacle lighting may be requested by civil aviation stakeholders, this is not required by law as only obstacles beyond the immediate surrounds (15 km) of an aerodrome which are in excess of 150 m are required to be lit under the Air Navigation Order[77].

25. It is anticipated that the Development will not cause a significant effect on aviation interests. The scope of any aviation impact assessment, if required, will be based on the outcome of consultation discussions with the relevant aviation consultees.

13.3.1 Scoped In Effects

26. It is anticipated that the Development will not cause a significant impact to aviation interests. The scope of any aviation impact assessment, if required, will be based on the outcome of consultation discussions with the relevant aviation consultees.

[77] The Air Navigation Order (2016) No. 765.

13.3.2 Scoped Out Effects

27. Until final turbine and layout information is available, it is not possible to fully scope out aviation effects at this stage.

13.4 Human Health

28. As per the EIA Regulations, a Human Health Impact Assessment (HHIA) should be included as part of the overall EIA process, with respect to the Development this section would simply draw together the findings of other assessments undertaken as part of the EIA process.

29. Limited Interactions with human health are possible, and consideration will be given to the findings of the following assessments:

- Traffic and Transportation;
- Noise;
- Residential Amenity;
- Shadow Flicker;
- Health and Safety at Work including best practice;
- Ice build-up on turbine blades and the risk of ice throw;
- Lightning strike; and
- Risk of turbine failure and consideration of in built emergency procedures including best practice.

30. Properly designed and maintained wind turbines are a safe technology.. The site design and inbuilt buffers from sensitive receptors will minimise the risk to humans from the operation of the turbines. Risks associated with ice build-up and lightning strike are removed or reduced through inbuilt turbine mechanisms in modern machines, and as such can be scoped out at this stage.

13.4.1 Scoped In Effects

31. Effects on Traffic and Transportation; Noise; Residential Amenity; Shadow Flicker will be assessed in full elsewhere within the ES. The Human Health assessment will draw together the findings of the individual assessments outlined above, arriving at an overall statement of significance.

13.4.2 Scoped Out Effects

32. All other potential interactions with Human Health including Health and Safety best practice, ice, lightning strike and structural failures are unlikely to occur and therefore to give rise to potentially significant effects and as such have been scoped out of further assessment at this stage.

13.5 Climate Change

33. The aim of the Climate Change Impact Assessment (CCIA) section is to determine how the Development is likely to interact with a changing climate and whether any significant effects could arise. CCIA is a new form of environmental assessment required by the amended European Commission (EC) Directive 2014/52/EU[78] as transposed into the EIA Regulations.

34. As CCIA is a new category of assessment currently only provisional guidelines exists to standardise the process in the UK. The Institute of Environmental Management and Assessment (IEMA) published 'Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation[79] in November 2015 with the intention of providing an updated and finalised version in 2017, once the Directive was transposed into UK law. As of early July 2017, this updated guidance has not yet been published. Accordingly, the proposed CCIA methodology was developed in line with the 2015 IEMA guidance and the text of the EU Directive and EC guidance[80] in order to establish a comprehensive assessment methodology. This methodology focuses on the following elements:

[78] European Parliament and Council Directive 2014/52/EU amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment.
[79] Institute of Environmental Management and Assessment (2015) IEMA Environmental Impact Assessment guide to Climate Change Resilience and Adaptation.
[80] European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. Available at http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf [Accessed 05/07/2017].

- Assessment of the Development's effects on climate change (calculation of carbon footprint based on best practice guidelines, *e.g.* Scottish Government Carbon Calculator Tool[81]) to include calculation of greenhouse gas emissions relating to construction, operation, decommissioning and the production of electricity;
- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projections and climate change effects; and
- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

35. The most recent climate projection iteration, UKCP09[82], has identified the following climatic trends as a result of climate change:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (*e.g.* an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
- Increased windstorms; and
- Sea level rise.

13.5.1 Baseline

36. The Development is inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity. The current baseline with respect to greenhouse gas emissions from existing methods of electricity generation (including the operational turbines onsite) will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Development to reducing greenhouse gas emissions and potential for significant effects.

37. Following initial peat proving surveys, it is noted that peat deposits have been recorded within the Site and, given the carbon storage properties of peat, consideration will be given to this within the CCIA.

13.5.2 Scoped In Effects

38. It is proposed that the assessment of the Development's effects on climate change will be scoped into the Environmental Impact Assessment (EIA) at this stage, given the associated carbon reduction properties of windfarms and the potential for peat disturbance. This will be assessed using the Scottish Government's Carbon Calculator Tool[81]. Further guidance will also be sought from consultees as to what is expected within this assessment.

13.5.3 Scoped Out Effects

39. It is proposed that the Development's vulnerabilities and resilience to climate change can be scoped out of the EIA. None of the identified climate change trends listed in **Section 13.5** could affect the Development with the exception of increased windstorms. Breaking mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced then the turbines would be shut down. In addition, given the elevated location of the Development, flooding will not pose a significant risk to the operation of the windfarm nor will the repowering of a windfarm contribute to flooding elsewhere. Therefore, it is concluded that no significant effects will arise, as a result of the Development, and this topic can be scoped out.

13.6 Waste

40. At this stage, the exact quantities and types of waste are unknown. It is expected that they could include:

- Excavated material;
- Waste arising from the decommissioning of the Operational Corkey Windfarm;
- Welfare facility waste;
- Packaging;
- Waste chemicals, fuels and oils;
- Waste metals;

[81] Scottish Government, 2016, Calculating Carbon Savings from Wind Farms on Scottish Peatlands - A New Approach [Online] Available at: http://informatics.sepa.org.uk/CarbonCalculator/ (Accessed 05/07/2017)
[82] http://ukclimateprojections-ui.metoffice.gov.uk/ui/admin/login.php [Accessed on 12/07/2017]

- Waste water from dewatering;
- Waste water from cleaning activities; and
- General construction waste (paper, wood, etc.).

41. A Site Waste Management Plan (SWMP) will detail how waste streams are to be managed, following the Waste Hierarchy[83] of prevention, reuse, recycle, recover and as a last resort, disposal to landfill.

42. All waste transported off the site will be to the appropriate licenced receivers of such materials. The number of vehicles associated with the removal of waste material associated with decommissioning and construction will be considered within Chapter 10: Access, Traffic and Transport of the ES.

43. Given the those receiving any waste materials, resulting from the Development, have been subject to their own consenting procedures and whose handling procedures of such waste materials have been deemed to be acceptable, there is no requirement for further consideration of waste to be undertaken, beyond the volume generated by the decommissioning and construction phase and numbers of vehicles associated with its transportation.

13.6.1 Scoped In Effects

44. The number of vehicles associated with the removal of waste material generated during the decommissioning and construction phase will be considered within Chapter 10: Access, Traffic and Transport of the ES.

13.6.2 Scoped Out Effects

45. It is not considered necessary for waste to be assessed further, due to the fact that all waste transported from the Site will be managed under licence. Therefore waste is scoped out from further assessment.

13.7 Key Questions for the Council / Consultees

46. Key questions for the Council and Consultees are:

- Do consultees agree that reflectivity can be scoped out of the EIA as unlikely to give rise to any significant environmental effects?
- Should no properties fall within ten rotor diameters and 130 degrees of north of the Development, are consultees content that shadow flicker effects can be scoped out of the EIA?
- Do Consultees agree with the suggested approach regarding Human Health?
- Are Consultees in agreement with the proposed CCIA methodology, in particular with the guidance and data sources referenced?

- Are Consultees in agreement that effects relating to waste, beyond those considered within ES Chapter 10: Access, Traffic and Transport, can be scoped out of the assessment?

[83] Schedule 3, Part 1 of *The Waste and Contaminated Land (Northern Ireland) Order 1997* places a duty on all persons who produce, keep or manage waste to apply the 'Waste Hierarchy' in order to minimise waste production at all stages of a development.

14 Scoping Consultation

1. The Applicant is fully committed to a thorough engagement process aiming to ensure that communities are consulted and informed of developments during, and beyond, the EIA process on all their projects. This is achieved by a variety of methods as appropriate including public exhibitions, meetings and circulars. Public consultation will be incorporated into the iterative design process and recorded in appropriate sections of the ES.

2. The Applicant will prepare and submit a Pre-Application Consultation (PAC) Report as part of the planning application. This will set out what sort of consultation has been carried out including who has been consulted, methods used and how the applicant has responded to comments including where these comments have influenced the design and layout of the Development

3. Comments from Consultees are specifically invited on:

- The proposed content of the ES;
- Assessment methods;
- Additional data sources; and
- Additional consultees.

4. In terms of the proposed content of the ES, it should be emphasized that one of the aims of this Scoping Request is to scope out any issues which are known not to be significant from further consideration and to highlight and focus on the main issues which should be assessed within the ES. This will be carried out based on a three tier approach:

- Not likely to have a significant effect as supported by current evidence;
- Likelihood of significant effect to be confirmed following further assessment or when more information is available; and
- Likely to have a significant effect.

5. All responses should be addressed to:

Arcus Consultancy Services Ltd
7th Floor
145 St Vincent St
Glasgow
G2 5JF
T. 0141 221 9997

6. Responses should also be directed to Causeway Coast and Glens Borough Council at:

Development Management
Causeway Coast and Glens Borough Council
Cloonavin
66 Portstewart Road
Coleraine
BT52 1EY

planning@causewaycoastandglens.gov.uk

7. If you would like any more information prior to responding to this Scoping Request, please contact Arcus at the address above.

8. A list of consultees contacted at scoping is included in **Appendix A**.

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Appendix A – List of Consultees

1. The organisations listed below will be consulted with the relevant information as part of the scoping process, although not all consultees will receive a complete copy of the Scoping Request.

Consultees to receive a copy of the Scoping Request:

- Causeway Coast and Glens Borough Council – Planning Department
- Causeway Coast and Glens Borough Council – Coast and Countryside;
- Causeway Coast and Glens Borough Council – Environmental Health;
- Causeway Coast and Glens Borough Council – Biodiversity;
- Transport NI;
- Department for Infrastructure - Rivers Agency;
- DAERA - Fisheries Division;
- DAERA - Forestry Division;
- DAERA - Countryside Management Branch;
- DAERA - Northern Ireland Environment Agency which includes;
    - DAERA - NIEA Water Management Unit;
    - DAERA - NIEA Waste Management;
    - DAERA - NIEA Natural Environment Division; and
    - DAERA - NIEA Countryside, Coast & Landscape Team.
- DCAL- Inland Fisheries Group;
- DfC- Historic Environment Division (HED) – Buildings & Monuments;
- Shared Environmental Services;
- Royal Society for the Protection of Birds;
- DfE - Geological Survey (NI);
- NI Water

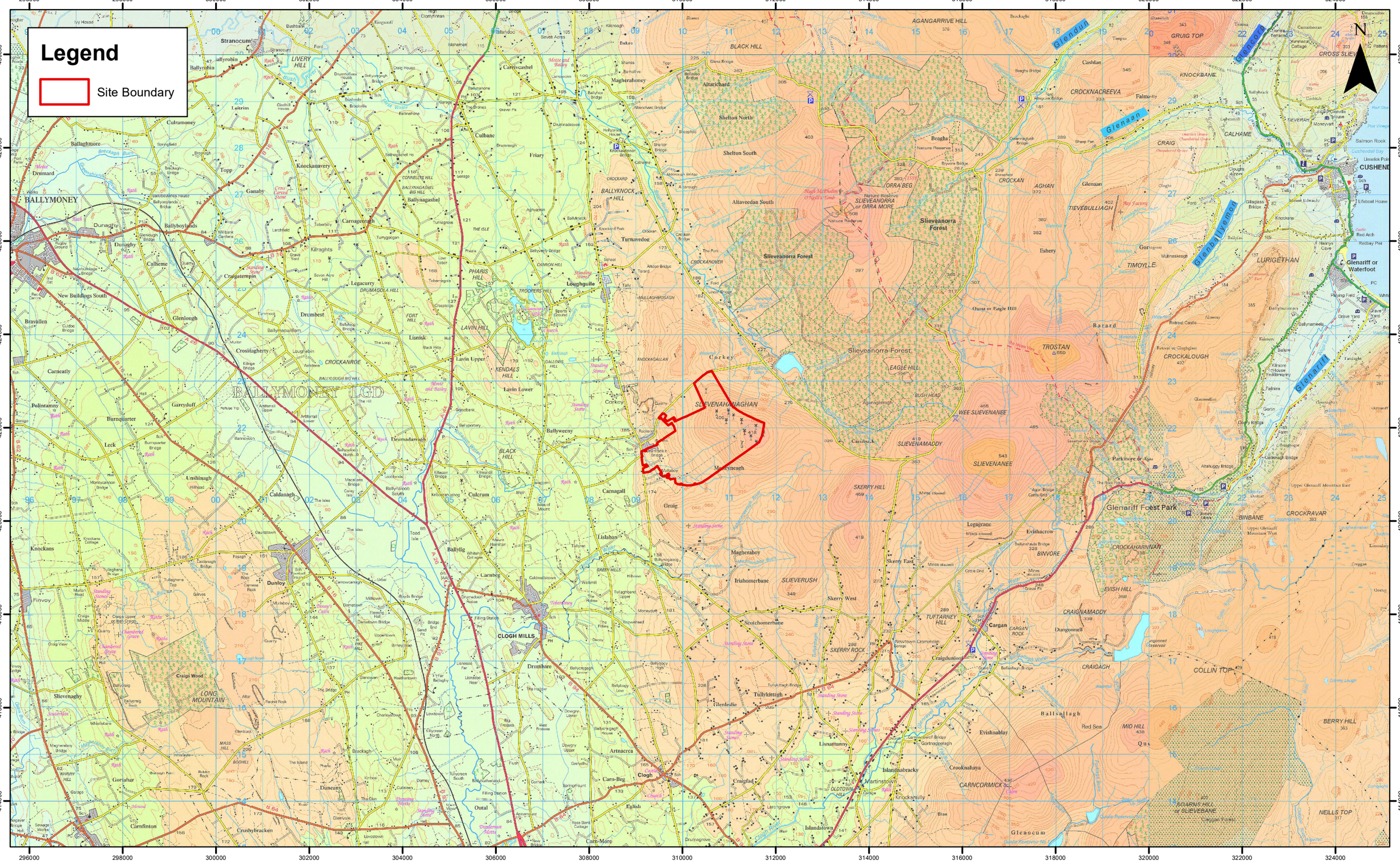
Consultees to be contacted during the assessment process, though not specifically during the scoping process:

- Arqiva;
- Cable and Wireless Worldwide PLC
- Vodafone;
- Eircom UK Limited;
- NI Water – Windfarms;
- Police Service Northern Ireland;
- System Operator for Northern Ireland (SONI);
- CAA;
- Belfast International Airport;
- City of Derry Airport;
- City of Belfast Airport;
- Joint Radio Company;
- MOD (Defence Infrastructure Organisation);
- NATS;
- Spectrum Licensing (Ofcom);
- TAUWI (the Telecommunications Association of the UK Water Industry [via Atkins].

Appendix B – Figures

1. This Appendix contains the following figures:

- Figure 1.1: Site Location Plan;
- Figure 2.1: Indicative Developable Area;
- Figure 5.1: Landscape Study Area;
- Figure 5.2: Landscape Character and Blade Tip ZTV;
- Figure 5.3: Landscape Designations and Blade Tip ZTV;
- Figure 5.4: Visual Receptors and Blade Tip ZTV;
- Figure 5.5: Cumulative Windfarms;
- Figure 6.1: Natura 2000 Sites;
- Figure 6.2: Sites of National Importance;
- Figure 6.3: Preliminary Habitat Map;
- Figure 9.1: Cultural Heritage Assets within 5 km;
- Figure 11.1: Interpolated Peat Depth; and
- Figure 13.1: Telecommunications Links.



B	17/07/2017	SC	Second Issue.
Rev	Date	By	Comment

0 1 2 4 Km

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SCOTTISHPOWER RENEWABLES

Corkey Windfarm Repowering

Site Location

Figure 1.1

Drawing Number:
2606-REP-005

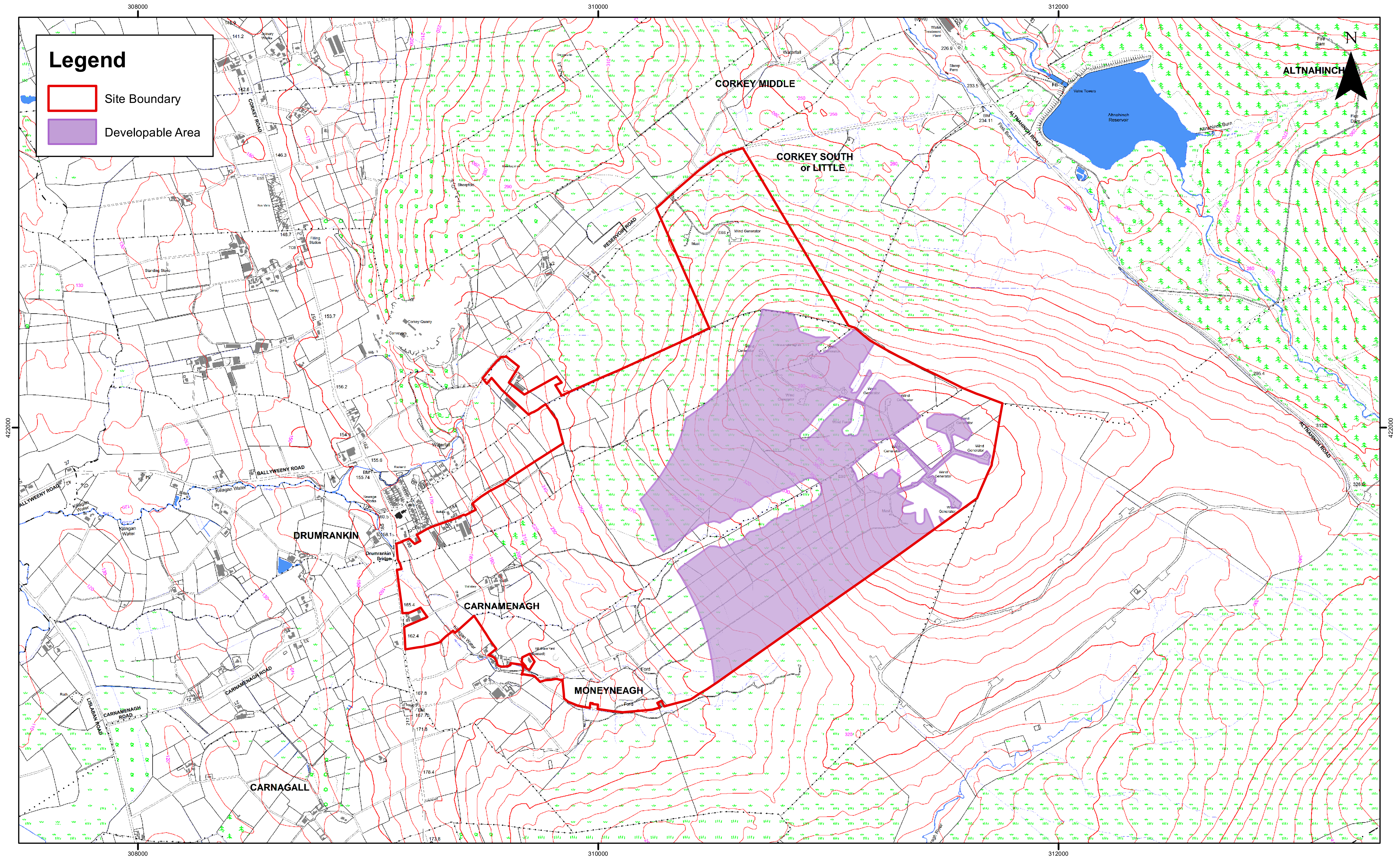
Datum
TM65

Projection
TM

Scale @ A3
1:75,000

Drawing produced by Arcus Consultancy Services

UKPS-FGE-GIS0009 REV 001



Rev	Date	By	Comment
A	26/06/2017	SC	First Issue.

0 125 250 500 m

Corkey Windfarm Repowering

Indicative Developable Area

Figure 2.1

Drawing Number: 2606-REP-006

Datum TM65

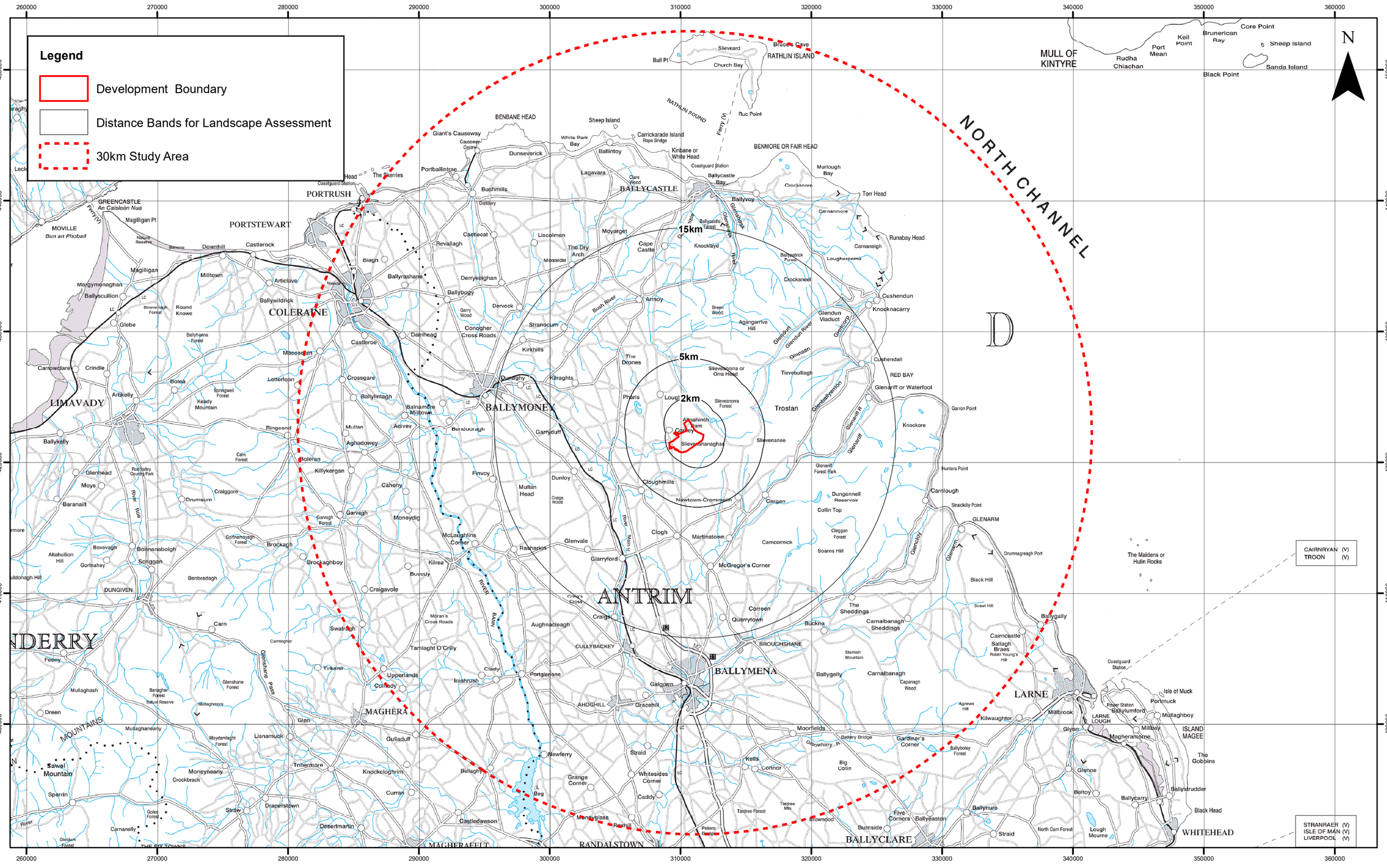
Projection TM

Scale @ A3 1:15,000

Drawing produced by Arcus Consultancy Services

SCOTTISHPOWER RENEWABLES

UKPS-FGE-GIS0009 REV 001



SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
3	27/07/17	TH	Third Issue.
2	10/07/17	TH	Second Issue.
1	30/06/17	TH	First Issue.

0 3.5 7 14 Km

Corkey Windfarm Repowering

Figure 5.1

Study Area

Drawing Number: 2607-REP-009

Datum TM65

Projection TM

Scale @ A3 1:265,000

Drawing produced by Optimised Environments Ltd.

UKPS-FGE-GIS0009 REV 001

Legend

- Development Boundary
- Distance Bands for Landscape Assessment
- 30km Study Area

No. of Blade Tips Visible

- 0
- 1 - 2
- 3 - 4
- 5

NIEA Landscape Character Areas (2008)

38. Eastern Binevenagh Slopes
39. Glenshane Slopes
50. Moyola Floodplain
51. Garvagh Farmland
52. Lower Bann Valley
53. Lower Bann Floodplain
54. Coleraine Farmland
55. Garry Bog
56. Dervock Farmlands
57. Causeway Coast and Rathlin Island
58. Long Mountain Ridge
59. Cullybackey and Clogh Mills Drumlins
60. River Main Valley
115. Tardree and Six Mile Water Slopes
116. Ballymena Farmland
117. Central Ballymena Glens
118. Moyle Moorlands and Forest
119. Ballycastle Glens
120. Fair Head
121. Moyle Glens
122. Garron Plateau
123. Larne Glens
124. Larne Basalt Moorland
125. Tardree Upland Pastures
126. Larne Coast
127. Larne Ridgeland

Blade tip height:	135m	Observer height:	2m
DTM:	OSNI 10	Surface features:	Excluded
DTM resolution:	10m	Earth curvature:	Included

Rev	Date	By	Comment
3	27/07/17	TH	Third Issue.
2	10/07/17	TH	Second Issue.
1	30/06/17	TH	First Issue.

SCOTTISHPOWER RENEWABLES

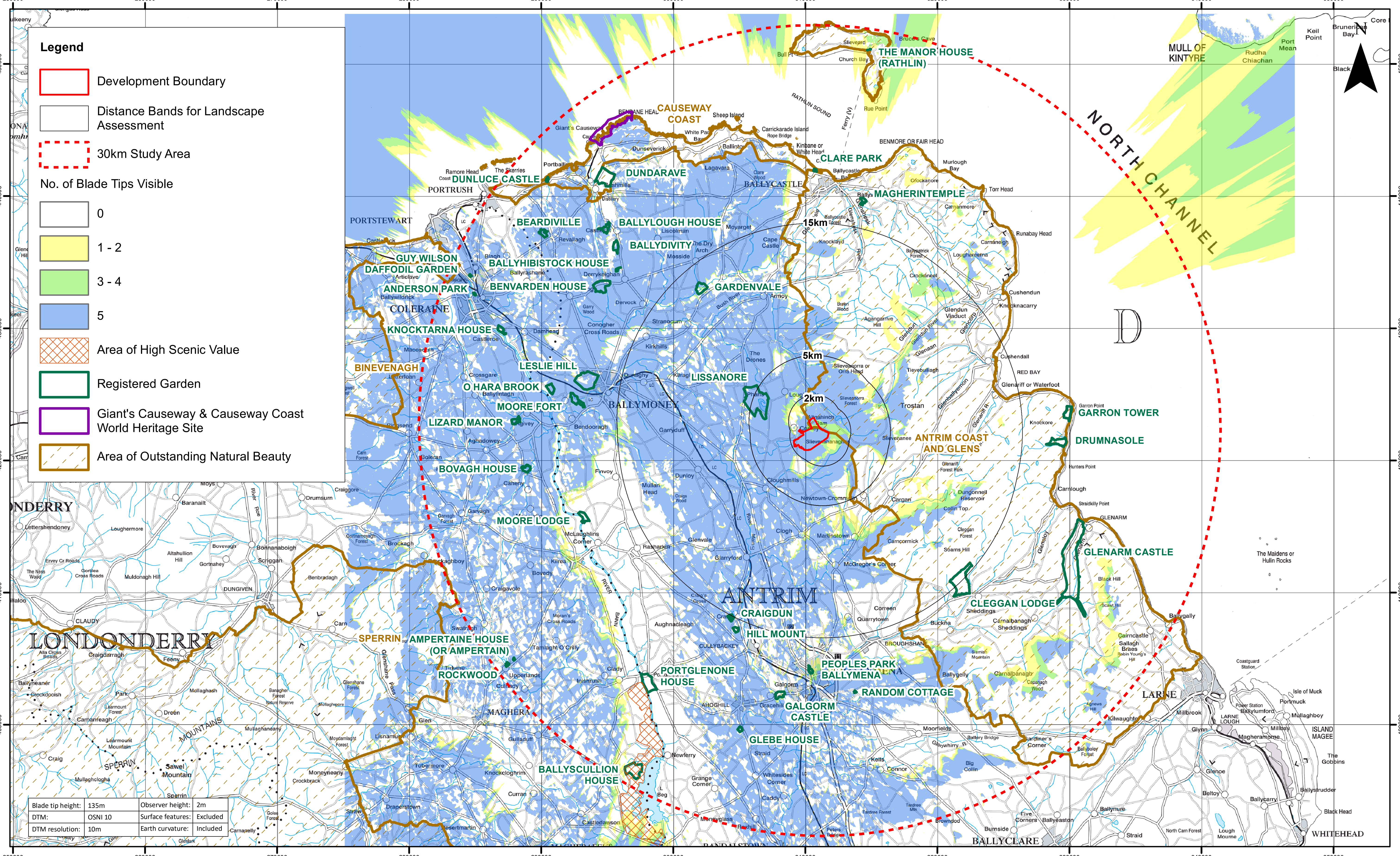
0 3.5 7 14 Km

Corkey Windfarm Repowering

Figure 5.2 - Landscape Character & Blade Tip ZTV

Drawing Number:	Datum	Projection
2607-REP-010	TM65	TM
Scale @ A3 1:265,000	Drawing produced by Optimised Environments Ltd.	

UKPS-FGE-GIS0009 REV 001


Legend
Development Boundary
Distance Bands for Landscape Assessment
30km Study Area
No. of Blade Tips Visible
0
1 - 2
3 - 4
5
Area of High Scenic Value
Registered Garden
Giant's Causeway & Causeway Coast World Heritage Site
Area of Outstanding Natural Beauty
Blade tip height: 135m
Observer height: 2m
DTM: OSNI 10
Surface features: Excluded
DTM resolution: 10m
Earth curvature: Included
NORTH CHANNEL
2km
5km
15km
THE MANOR HOUSE (RATHLIN)
CAUSEWAY COAST
CLARE PARK
DUNDARAVE
DUNLUCE CASTLE
MAGHERINTEMPLE
BEARDIVILLE
BALLYLOUGH HOUSE
BALLYDIVITY
GUY WILSON DAFFODIL GARDEN
BALLYHIBISTOCK HOUSE
ANDERSON PARK
BENVARDEN HOUSE
GARDENVALE
KNOCKTARNA HOUSE
BINEVENAGH
LESLIE HILL
LISSANORE
O HARA BROOK
MOORE FORT
LIZARD MANOR
GARRON TOWER
DRUMNASOLE
ANTRIM COAST AND GLENS
BOVAGH HOUSE
MOORE LODGE
GLENARM CASTLE
CLEGGAN LODGE
CRAIGDUN
HILL MOUNT
SPERRIN
AMPERTAINE HOUSE (OR AMPERTAIN)
ROCKWOOD
PORTGLENONE HOUSE
PEOPLES PARK
BALLYMENA
RANDOM COTTAGE
GALGORM CASTLE
GLEBE HOUSE
BALLYSCULLION HOUSE
PORTRUSH
PORTSTEWART
COLERAINE
BALLYCASTLE
BALLYMONEY
ANTRIM
LONDONDERRY
MAGHERA
LARNE
BALLYCLARE
WHITEHEAD
MULL OF KINTYRE
ISLAND MAGEE

Rev	Date	By	Comment
3	27/07/17	TH	Third Issue.
2	10/07/17	TH	Second Issue.
1	30/06/17	TH	First Issue.

SCOTTISHPOWER RENEWABLES

0 3.5 7 14 Km

Corkey Windfarm Repowering

Figure 5.3 - Landscape Designations & Blade Tip ZTV

Drawing Number: 2607-REP-011

Datum TM65

Projection TM

Scale @ A3 1:265,000

Drawing produced by Optimised Environments Ltd.

UKPS-FGE-GIS0009 REV 001

Legend

- Development Boundary
- Distance Bands for Visual Receptor Assessment
- 30km Study Area
- Settlement
- Railway
- Motorway
- A Road
- B Road
- National Cycle Route
- Sperrins Scenic Route
- Walking Route

1. Ulster Way
2. Antrim Hills Way
3. Dungonnell way
4. The Croaghan Way

No. of Blade Tips Visible

- 0
- 1 - 2
- 3 - 4
- 5

Viewpoint Location

1. Drumrankin
2. Lislaban
3. Reservoir Road
4. Loughgiel
5. Altnahinch Road south
6. Altnahinch Reservoir
7. Slieveanorra
8. Ballycregagh Road, Clough Mills
9. B94 over A26 west of Clough Mills
10. Tullaghans Road, Dunloy
11. Ballymeany
12. Altnahinch Road north
13. Cemetery near Glarryford
14. Kildoan Hill
15. Slemish
16. A26 layby
17. Ballymoney
18. Boghill, Long Mountain

Blade tip height:	135m	Observer height:	2m
DTM:	OSNI 10	Surface features:	Excluded
DTM resolution:	10m	Earth curvature:	Included

NORTH CHANNEL

15km 5km 2km

Rev	Date	By	Comment
3	27/07/17	TH	Third Issue.
2	10/07/17	TH	Second Issue.
1	30/06/17	TH	First Issue.

SCOTTISHPOWER RENEWABLES

0 3.75 7.5 15 Km

Corkey Windfarm Repowering

Figure 5.4 - Visual Receptors & Blade Tip ZTV

Drawing Number:	Datum	Projection
2607-REP-012	TM65	TM
Scale @ A3 1:265,000	Drawing produced by Optimised Environments Ltd.	

UKPS-FGE-G/SI0009 REV 001

Legend

- Development Boundary
- Distance Bands for Landscape Assessment
- 30km Study Area
- Corkey Operational Turbines
- Corkey Operational Turbines Theoretical Visibility
- Corkey Repowering Turbines Theoretical Visibility
- Combined Theoretical Visibility

Op BT:	57m		
Blade tip height:	135m	Observer height:	2m
DTM:	OSNI 10	Surface features:	Excluded
DTM resolution:	10m	Earth curvature:	Included

SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
2	27/07/17	TH	Second Issue.
1	18/07/17	TH	First Issue.

Km
0 3.5 7 14

Corkey Windfarm Repowering

Figure 5.5 - Combined ZTV
Corkey Operational Turbines

Drawing Number: 2607-REP-013

Datum TM65

Projection TM

Scale @ A3 1:265,000

Drawing produced by Optimised Environments Ltd.

UKPS-FGE-GIS0009 REV 001

Legend

- Development Boundary
- Distance Bands for Landscape Assessment
- 30km Studay Area

Cumulative Windfarm Status

- Application
- Consented
- Under Construction
- Operational

Single Wind Turbines

- Application
- Consented

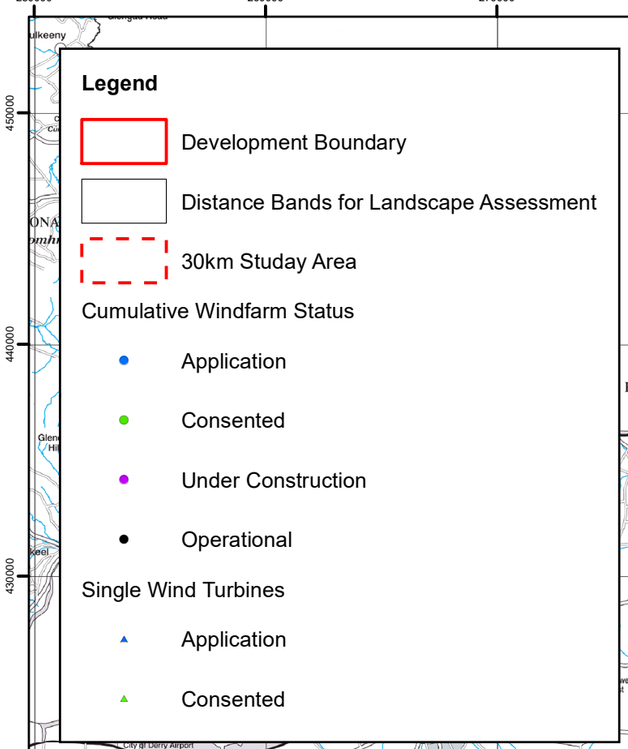
NORTH CHANNEL

D

CARNEATLEY
CLOONTY
ALTAVEEDAN
CAM BURN
CORKEY EXTN.
GRUAIG
GARVES
GLENBUCK
LONG MOUNTAIN
RATHSHERRY
ELGINNY HILL
CRAIG 1&2
CARNALBANAGH

64 SHELTIN RD.
8 CORKEY RD.
108 CORKEY RD.
145 CORKEY RD.
15 RESERVOIR RD.
188 CORKEY. RD.
21 RESERVOIR RD.
237 CORKEY RD.
12 & 15 GRUIGE LANE
15 GRUIGE LANE (RESUB)
48 & 58 TULLYKITTAGH RD.
24 & 29 OMERBANE RD.
35 MONEYDUFF RD.
31 OMERBANE RD.
100 GLENLESLIE RD.

PORTRUSH
PORTSTEWART
COLERAINE
BALLYMONEY
BALLYCASTLE
BALLYMENA
LONDONDERRY
ANTRIM
MAGHERA
DUNGIVEN
EGLINTON
LARNE
BALLYCLARE
RATHLIN ISLAND
MULL OF KINTYRE



Rev	Date	By	Comment
3	27/07/17	TH	Third Issue.
2	10/07/17	TH	Second Issue.
1	30/06/17	TH	First Issue.

0 3.5 7 14 Km

Corkey Windfarm Repowering

Figure 5.6 - Cumulative Windfarms (OPEN, July 2017)

Drawing Number: 2607-REP-014

Datum TM65

Projection TM

Scale @ A3 1:265,000

Drawing produced by Optimised Environments Ltd.

UKPS-FGE-GIS0009 REV 001

Legend

- Site Boundary
- 5 km Buffer of Site Boundary
- 15 km Buffer of Site Boundary

Natura 2000 sites

- Special Protection Areas
- Special Area of Conservation

N

Breen Wood
Red Bay
Garry Bog
Antrim Hills SPA
Garron Plateau
Main Valley Bogs
Wolf Island Bog
Dead Island Bog
Carn – Glenshane Pass

285000 290000 295000 300000 305000 310000 315000 320000 325000 330000 335000 340000

435000 430000 425000 420000 415000 410000 405000

SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
A	07/07/2017	SC	First Issue.

0 2 4 8 Km

Corkey Windfarm Repowering

Natura 2000 sites

Figure 6.1

Drawing Number:	Datum	Projection
2606-REP-015	TM65	TM
Scale @ A3 1:150,000	Drawing produced by Arcus Consultancy Services	

UKPS-FGE-GIS0009 REV 001

Legend

Sites of National Importance

- National Nature Reserves (NNRs)
- Areas of Special Scientific Interest (ASSIs)

N

285000 290000 295000 300000 305000 310000 315000 320000 325000 330000 335000

435000 430000 425000 420000 415000 410000 405000

Craigahulliar
Tow River Wood
Capecastle
Carey Valley
Breen Wood
Breen Oakwood
Garry Bog
Garry Bog Part II
Slievanorra Forest
Glenballyemon River
Tievebulliagh
Slieveanorra and Croaghan
Cloghastucan
Garron Plateau
Galboly
Glenariff
Glenariff Waterfalls
Black Burn
Caldanagh Bog
Dunloy Bog
Glenariff Glen
Gortnagory
Lemnalary
Craigs
Glarryford
Ballymacaldrack
Cranny Falls
Straidkilly Wood
Straidkilly
Little Deer Park
Tully Hill
Frosses Bog
Errigal Glen
Minnis
Cleggan Valley
Rathsherry
Glenarm Woods Part 2
Glenarm Woods
Feystown
Scawt Hill
Ballygalley Head
Wolf Island Bog
Glen Burn
Linford
Dead Island Bog
Carn/Glenshane Pass
Ballyknock
Knock Dhu
Sallagh Braes

0 2 4 8 Km

Rev	Date	By	Comment
A	07/07/2017	SC	First Issue.

Corkey Windfarm Repowering

Sites of National Importance

Figure 6.2

Drawing Number:	Datum	Projection
2606-REP-016	TM65	TM
Scale @ A3 1:150,000	Drawing produced by Arcus Consultancy Services	

UKPS-FGE-GIS0009 REV 001

Legend

- Site Boundary
- G2 Streams
- E1.8 Dry modified bog
- E1.7 Wet modified bog
- E1.6.1 Blanket mire (NVC M19)
- D2 Wet dwarf shrub heath
- B4 Improved grassland
- B1 Acid grassland
- A2 Dense gorse scrub
- A1 Conifer plantation
- J4 Exposed bedrock

CORKEY SOUTH or LITTLE

DRUMRANKIN

CARNAMENAGH

MONEYNEAGH

RESERVOIR ROAD

ALTNAHINCH ROAD

BALLYWEENY ROAD

CARNAMENAGH ROAD

Altnahinch Reservoir

Killagan Water

Flusk Burn

Corkey Quarry

Drumrankin Bridge

Wind Generator

Wind Farm

BM 234.11

BM 155.74

BM 167.70

308000 310000 312000

422000

N

SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
A	07/07/2017	SC	First Issue.

0 125 250 500 m

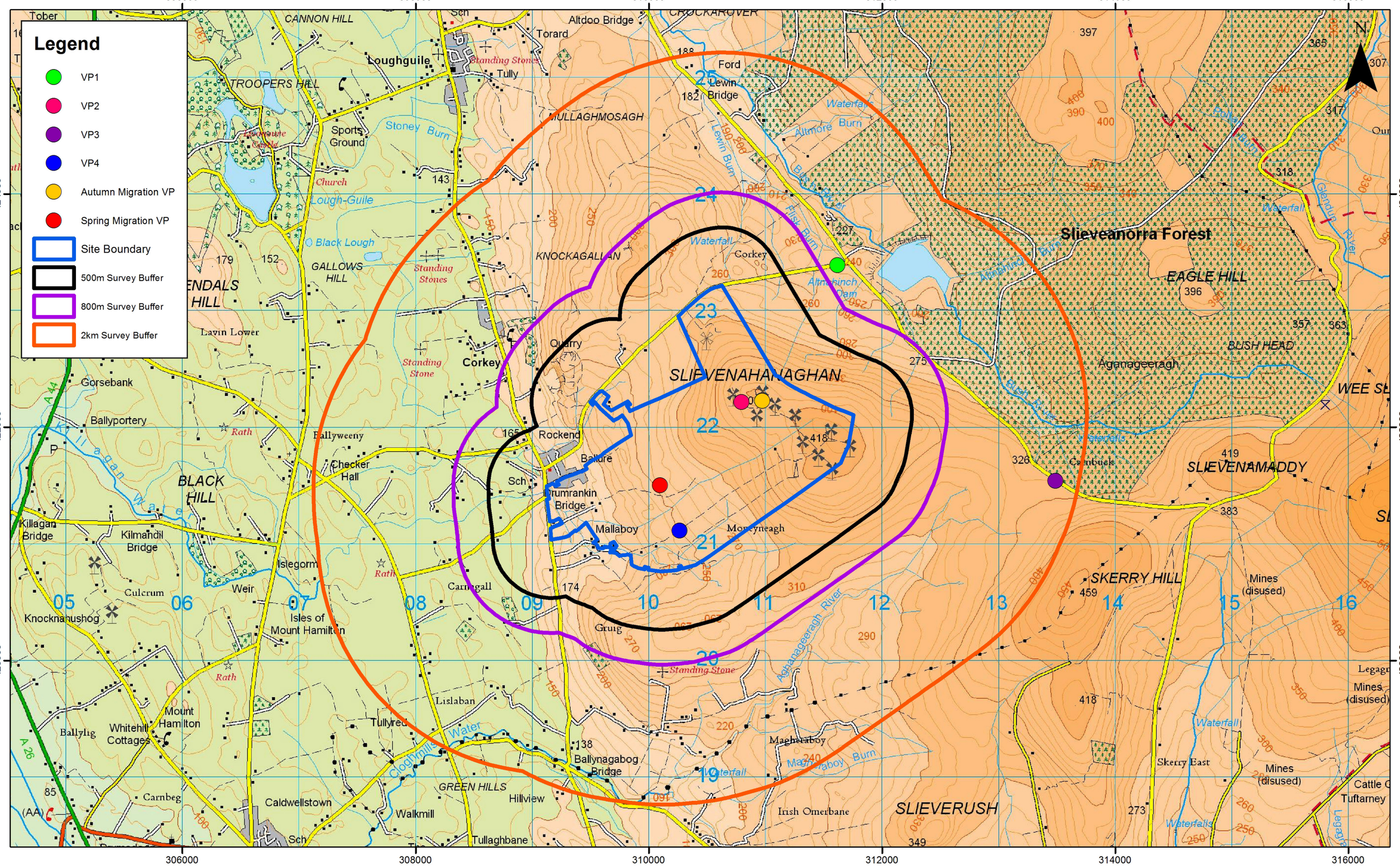
Corkey Windfarm Repowering

Preliminary Habitat Map

Figure 6.3

Drawing Number:	Datum	Projection
2606-REP-017	TM65	TM
Scale @ A3 1:12,500	Drawing produced by Arcus Consultancy Services	

UKPS-FGE-GIS0009 REV 001



Rev	Date	By	Comment
A	28/07/17	AM	First Issue

0 0.5 1 2 Km

Corkey Windfarm Repowering

Ornithological Survey Features

Figure 7.1

Drawing Number:	Datum	Projection
2606-REP-019	TM65	TM
Scale @ A3 1:30,000	Drawing produced by Birdsurveyors Ltd.	

UKPS-FGE-GIS0009 REV 001

Legend

- Sites and Monuments Record
- B Listed Building
- B1 Listed Building
- B2 Listed Building
- Scheduled Monument
- Lissanoure Historic Park and Garden
- Site Boundary
- 1 km Study Area
- 5 km Study Area

A	21/06/2017	SC	First Issue.
Rev	**Date**	**By**	**Comment**

Km
0 0.475 0.95 1.9

Corkey Windfarm Repowering

Cultural Heritage Assets within 5 km

Figure 9.1

Drawing Number: 2606-REP-008

Datum TM65

Projection TM

Scale @ A3 1:55,000

Drawing produced by Arcus Consultancy Services

UKPS-FGE-GIS0009 REV 001

Legend

- Site Boundary
- Peat Probe Location

Interpolated Peat Depth (m)

- 0 - 0.5
- 0.51 - 1.0
- 1.01 - 1.5
- > 1.51

CORKEY SOUTH or LITTLE

CARNAMENAGH

RANKIN

RESERVOIR ROAD

ALTNAHINCH ROAD

Altnahinch Reservoir

Altnahinch Burn

Flisk Burn

Corkey Quarry

Conveyors

Waterfall

Rockend

Sewage Works

Drumrankin Bridge

Mallaboy

Killagan Water

Kilgrave Yard (Disused)

Mast

Wind Generator

ESS

BM 234.11

BM 155.74

310000

312000

422000

0 125 250 500 m

Rev	Date	By	Comment
A	12/07/2017	SC	First Issue.

SCOTTISHPOWER RENEWABLES

Corkey Windfarm Repowering

Interpolated Peat Depth

Figure 11.1

Drawing Number:	Datum	Projection
2606-REP-020	TM65	TM
Scale @ A3 1:10,000	Drawing produced by Arcus Consultancy Services	

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Legend

- Site Boundary
- Telecommunication Link Operator
- JRC

N

Rev	Date	By	Comment
A	05/07/2017	SC	First Issue.

SCOTTISHPOWER RENEWABLES

0 0.5 1 2 Km

Corkey Windfarm Repowering

Telecommunication Links

Figure 13.1

Drawing Number: 2606-REP-014

Datum TM65

Projection TM

Scale @ A3 1:50,000

Drawing produced by Arcus Consultancy Services

UKPS-FGE-GIS0009 REV 001

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