ScottishPower Renewables

Harestanes West Windfarm

Design and Access Statement

December 2024

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Abbreviations

AIL	Abnormal Indivisible Load
CEMP	Construction Environmental Management Plan
DAS	Design Access Statement
DGC	Dumfries and Galloway Council
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
FLS	Forestry and Land Scotland
GWh	Gigawatts
HGV	Heavy Goods Vehicles
LDP2	Local Development Plan 2
LGV	Light Good Vehicles
m	Metres
MW	Megawatts
NGR	National Grid Reference
PAC	Pre-application Consultation Report
PANs	Planning Advice Notes
PIEs	Public Information Events
PPA	Power Performance Assessment
SPR	ScottishPower Renewables
UK	United Kingdom
ZTV	Zone of Theoretical Visibility

1. Introduction

1. ScottishPower Renewables (UK) Limited (SPR) (hereafter 'the Applicant') is part of the Iberdrola Group, one of the world's largest integrated utility companies and a world leader in wind energy. The Applicant is a licensed generator of electricity, and is has obligations under Schedule 9 of the Electricity Act to consider environmental matters as an integral part of its design process.

2. The application is for consent to construct and operate a windfarm comprising of 12 turbines, six of up to 200 metres (m) to tip and six of up to 220 m to tip with an installed capacity of around 84 megawatts (MW).

3. The Applicant is submitting an application for Harestanes West Windfarm (hereafter 'the proposed Development') under Section 36 of the 1989 Electricity Act. In support of the application, the Applicant has undertaken an Environmental Impact Assessment (EIA) and produced its findings in the EIA Report. The EIA Report informs the readers of the nature of the proposed Development, potential significant environmental effects and measures proposed to protect the environment during site preparation, construction and operation.

4. The Design and Access Statement (DAS) is submitted in support of the application for consent which has been submitted for the proposed Development. The DAS should be reviewed in the context of the EIA Report and in particular **Chapters 2 and 3,** which provide a detailed description of the final layout of the proposed Development.

2. Site Location

5. The area within the Application Boundary (centred on National Grid Reference (NGR NX 9599 31814), hereafter referred to as 'the Site', is situated within commercial forestry managed by Forestry and Land Scotland (FLS), located northwest of the village of Ae. In order to understand the design of the proposed Development it is considered important to understand the Site and its context. The proposed Development is located in Dumfries and Galloway Council (DGC) administrative area and comprises of 12 wind turbines, six with a maximum height of 220 m and six with a maximum height of 200 m and associated infrastructure such as substation and access tracks. A site plan is shown in **Figure 2** and a plan showing the Application Boundary is shown in **Figure 3.**

2.1. Site Description

6. A detailed description of the Site can be found in the **Chapter 2** of the EIA Report. The following paragraphs provide a general description of the Site.

7. The Site is comprised of two principal components: the 'turbine area', and the 'access track to the turbine area'. The 'turbine area' comprises the proposed turbines, crane hardstandings, substation, meteorological mast, network of connecting tracks and associated infrastructure. The centre of the turbine area is at NGR NX95993 91814. The 'access track to the turbine area' consists of the proposed access track leading from the A701 public road to the turbine area within the Site. Separate to these, there is also an area

proposed for habitat improvement located to the east of the access track to the turbine area.

8. The main transport routes within the immediate area include the A76 which lie approximately 4.5 kilometres (km) to the west of the turbine area and the A701 lie approximately 5 km to the south-east, which connects to a minor road that then runs north through the village of Ae and north to south through the centre of the Site.

9. The turbine area lies to the west of the Water of Ae and the Windy Hill Burn runs through the centre of the turbine area from north-west to south-east. The turbine area is made up of undulating hills that form part of the upland plateau or range of hills between Annandale to the east and Nithsdale to the West.

10. The area of Forest of Ae within which the turbine area is located, is managed by Forestry and Land Scotland (FLS) as a commercial forestry and has recreational facilities including car parking facilities and the Forest of Ae Café and Bike Shop located on the outskirts of the village of Ae. There are several waymarked walking routes and mountain bike trails within the Forest of Ae. Several core paths extend through the turbine area including one in the southern area which provides a circular walking path around Windy Hill. There is also an outer bend of a mountain bike path called Andy Hopkins in the north-eastern section of the Site going around Morins Hill. The immediate area surrounding the Site is rural with land used predominantly for agriculture and commercial forestry purposes. There is a relatively low population density within the vicinity, with few properties located within 1 km of the Site. The proposed Development would require forest restructuring works to enable construction and operation of the proposed Development.

11. There is one designation within the Site; the transition zone of Galloway and Southern Ayrshire UNESCO Biosphere Reserve which stretches along the western edge of the Application Boundary and crosses into the turbine area in the north-west corner. There are no Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), or Listed Buildings within the Site.

12. The Site comprises an area of approximately 1,242hectares (ha), with its location and wider context shown in **Figures 1 and 2**.

2.2. Surrounding Area

13. The immediate area surrounding the Site is characterised by land used for commercial forestry. The area to the south includes areas of pasture around the A701 and the village of Ae, as well as open moorland around Whitestanes Moor.

14. The operational 15-turbine Dalswinton Wind Farm is located approximately 0.6 km away from the turbine area to the southwest. The access track to the turbine area crosses through the operational Harestanes Windfarm, a 68-turbine wind development located approximately 3.1 km away from the turbine area. In addition, the Harestanes BESS, located approximately 4.6 km away from the turbine area is currently under construction to the north of the existing Harestanes Windfarm.

15. There are several Landscape designations outwith the Site. The closest environmental designations within 10 km of the Site are shown in **Figure 4**.

3. Design Policies

3.1. National Guidance

16. The design of the proposed Development was carefully considered in the context of national advice in respect of design, the development plan and supplementary guidance which is relevant to the proposed Development.

17. The most important national policy relating to the siting and design of the proposed Development are the National Planning Framework 4 (NPF4) and associated Planning Advice Notes (PANs), and the Onshore Wind Turbines: Planning Advice. See **Chapter 4** of the EIA Report.

18. In relation to the design and layout of windfarms, NPF4 sets out the basis for a spatial framework in which developments seek to protect, restore and enhance natural assets.

19. Policy 11 of the NPF4 sets out the basis for a spatial framework in which windfarms will be assessed, based on the following:

- development proposal for winds farms in National Parks and National Scenic Areas will not be supported;
- development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities;
- development proposals that impact on international or national designations will be assessed in relation to Policy 4; and
- project design and mitigation will demonstrate how the following impacts are addressed:
  - Impacts on communities and individual dwellings, including, residential.

20. The Onshore Wind Turbines: Planning Advice, published by the Scottish Government in 2014 provides an overview of common issues which need to be considered and some guidance on how to assess these in order to inform onshore wind design. The advice relating to onshore wind design, such as landscape assessment, shadow flicker analysis, noise potential impacts on wildlife and more has been incorporated into the design of the proposed Development.

3.2. Development Plan

21. The preparation of the DAS has had regard to planning advice note 68: Design Statements, the Dumfries and Dumfries and Galloway Local Development Plan 2 (LDP2) (adopted October 2019) and its associated Supplementary Guidance.

22. In relation to the Spatial Framework detailed in LDP2 Supplementary Guidance; Wind Energy Development Policy IN1, the Dumfries and Galloway Council will support development proposals for all renewable energy generation which are located, sited and designed appropriately.

23. The Development Plan is defined by the Town and Country Planning (Scotland) Act 1997, as amended, as being the local development plan, the planning's authority's resolution of adoption and any supplementary guidance issued in connection with the local development plan. The Development Plan for the Site is the Dumfries and Galloway LDP2 and its associated Supplementary Guidance. The LDP2 was adopted in 2019.

24. **Chapter 4** of the EIA Report sets out the proposed Development in the context of the relevant Development Plan policies. The **Planning Statement** provides an assessment of the proposed Development against the Development Plan and material considerations relevant to the decision-making process.

25. The key LDP2 policy for the proposed Development is policy IN1 Renewable Energy, which states that: *"The Council will support development proposals for all renewable energy generation and/or storage which are located, sited and designed appropriately"*.

4. Design Principles

26. This DAS discusses the key design issues and constraints relevant to the proposed Development and the way they have been addressed in the layout and design. **Figure 5** shows a heatmap of the Site Constraints. This section illustrates the studies and assessment work which has been considered in the design process. Section 6 describes how the factors have influenced the design of the scheme.

4.1. Wind Turbine Scale

27. Taller turbines produce more electricity, as with height both wind speed and yield increase. Bigger rotors also capture wind more efficiently and produce more electricity per turbine.

28. The wind turbines selected for the proposed Development would each have a rating of about 7 MW based on wind turbine technology which is currently available and would have a maximum height of 220 m to blade tip. This would maximise the contribution that the proposed Development could make towards the Scottish Government's net-zero and associated renewable energy targets.

29. The necessity for taller turbines is recognised in the Scottish Government's Onshore Wind Policy Statement (December 2022) which asks for the integration of onshore wind development in forested areas which can only be possible if taller, more efficient turbines are installed.

30. As demonstrated in **Chapter 7** of the EIA Report, it is considered that the landscape character of the Site can accommodate taller turbines. In addition to maximising the overall yield of the proposed Development, the use of taller turbines translates into fewer number of turbines. This also helps minimising felling by increasing the rotor clearance above the tree canopy, therefore reducing the impact of existing forestry operations.

31. Furthermore, the supply of smaller wind turbines across Europe is already reducing, due to the lack of demand as manufacturers are recognising the world market is shifting to larger machines and development work is focussing on larger turbines to secure higher yield. The onshore wind industry is experiencing a significant reduction in supply of smaller wind turbines and therefore it is unlikely that a range of smaller turbines (e.g. 150 m) would

be available at competitive prices by the time the proposed Development would be constructed.

32. The final selection of the turbine tip height of up to 220 m was considered to represent the best balance in terms of energy yield, landscape fit and the scale of the turbine that is currently capable of being transported to the Site.

4.2. Wind Analysis

33. Wind analysis and wake modelling has been carried out by the Applicant to identify the areas of the Site most likely to produce the highest yields and therefore the best generational output.

34. For turbines to work as effectively as possible, they must be suitably spaced relative to the predominant wind direction. If they are too close together in this direction, the wake effects from the wind turbines located on the upwind edge of the array would create turbulent air for the next row and so on through the array, reducing the overall energy output. Instead, when turbines are located too far apart the opportunity to increase capacity is reduced.

35. There is no industry standard for spacing, only manufacturer recommendations and rule of thumb. Six times rotor diameter in the predominant wind direction and four times rotor diameter (RD) cross wind (6 RD X 4 RD) is a common starting point. This is understood to provide a reasonable compromise between turbine proximity and site capacity without unduly compromising turbine operation. The proposed Development may, however, employ turbines which are not yet on the market. Therefore, a more flexible methodology utilising wind yield modelling was used to find the right balance of turbine efficiency and productivity over a wide variety of potential rotor diameters.

4.3. Landscape Character and Visual Amenity

36. The design of the wind turbine layout is a vital part of the landscape and visibility effects of a wind farm. Its appearance considered on its own in the context of the surrounding landscape and cumulatively were important considerations. Landscape and visual input to the design was informed by NatureScot's (then 'SNH') Siting and Designing Wind Farms in the Landscape Version 3a (2017), experience and drawing on fieldwork observations. In addition to those general design principles, the following key landscape and visual sensitivities were identified as key factors for consideration in the design:

- minimise prominence of the proposed Development in views from the Dumfries and Galloway Thornhill Uplands Regional Scenic Area (RSA) and the Nith Estuary National Scenic Area (NSA);
- reduce the prominence of the proposed Development in views from nearest residents and settlement including the village of Ae and recreational users in the area;
- consider the impacts with nearby cumulative developments including operational Dalswinton Windfarm and Harestanes Windfarm, as well as other proposals such as Harestanes South Windfarm Extension;
- reduce the prominence of the proposed Development in views from key transport routes including the A76 and A701; and

- avoid significant impacts upon most valued landscape features on Site and seek enhancements where possible.

The final proposed Development layout has considered the following:

- reasonably consistent and balanced relationship when seen from the surrounding area, particularly when seen in views from the village of Ae to the south as well as locally prominent locations such as Queensberry to the north;
- non-significant effects on visual amenity for nearby settlements, as well as most dispersed properties in proximity to the Site; and
- Where possible, proposed excavation for access tracks and other infrastructure has been minimised and the location of the substation and construction compound have been reviewed, and the selected option has been chosen in order to minimise visual effects.

37. The landscape and visual effects of the proposed Development are addressed further in **Chapter 7: Landscape and Visual Impact Assessment**. **Section 7.6.4** details the key landscape and visual design principles that were adopted during design evolution to mitigate against impacts on the key sensitive receptors above.

4.4. Ecology and Ornithology

38. Ecological surveys have been carried out across the Site since 2022, including a UK habitats survey, a National Vegetation Classification (NVC) survey and protected species surveys (including bats, pine marten, badger, otter, water vole, red squirrel and fish). Sensitive ecological features, including habitats present within the Site and species which use the Site and appropriate buffers, have been avoided as far as possible. The proposed Development avoids ecological features of greatest sensitivity, such as Annex 1 peatlands. In addition, the recommended habitat standoff distances from blade swept path to key habitat features have been incorporated into the design to reduce collision risk to bats.

39. Ornithology surveys have been carried out across the Site and surrounding area over a 24-month period between September 2019 and August 2021, including:

- vantage point watches;
- scarce breeding birds (for raptors, divers and any other species listed in Schedule 1 of the Wildlife and Countryside Act 1981); and
- winter walkovers for non-breeding birds.

40. Suitable buffers were considered during the design evolution process and areas have been specifically avoided to minimise the impact on sensitive species.

41. The ecology and ornithology effects of the proposed Development are addressed further in **Chapter 8: Ecology and Biodiversity**, and **Chapter 9: Ornithology**.

4.5. Hydrology and Hydrogeology

42. In accordance with good industry practice, a 50 m buffer zone has been applied around all watercourses on the Site for wind turbines. This reduces the risk of runoff, loose sediment and potential pollutants entering watercourses. In some cases, the use of existing tracks, already within 50 m of drainage ditches, have been identified as the best option for design, minimising the need for new tracks. In a few other locations, the balance of constraints has required use of a narrower buffer zone. Watercourse crossings have been minimised as far as practicable; and where possible, existing crossings would be used. Existing crossings may be upgraded or replaced as appropriate.

43. Data on private water supplies (PWS) within 10 km of the Site were obtained from DGC. No PWS are present within the Site and linkages up to 5 km downstream were assessed. PWS are not identified as a constraint to development.

44. Areas with potential to be Groundwater Dependent Terrestrial Ecosystems (GWDTE) were also examined. Several areas of GWDTE were identified within the Application Boundary. All potential GWDTE were considered to be sensitive and have been avoided as far as practicable by careful design.

45. The hydrology and hydrogeology effects of the proposed Development are addressed further in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

4.6. Peat Depth

46. The majority of the Site is underlain by Class 4 soils; which are areas unlikely to be associated with peatland habitats and are unlikely to include carbon-rich soils (NatureScot, 2016). The Site is also underlain by Class 5 soils, these represent areas of commercial forestry plantation on peat soils and have a lack of peatland vegetation. The remainder of the Site is underlain by Class 0 mineral soils.

47. Site visits have confirmed the presence of peat (**Chapter 10**) and peatland habitats (**Chapter 8**). Peat probing and habitat surveys were undertaken in 2023 and 2024 and show that the peat is of variable condition and depth across the Site, with deeper peat occurring at Glenmaid Moor, Peat Moss, Dry Rig and to the north of Gubhill Rig. Other areas of the Site are characterised by peaty soils and mineral soil. The peat probing data is discussed in **Technical Appendix 10.1**.

48. A review of the peat depth data and habitat mapping, in conjunction with slope gradients, allowed areas of deep peat (typically greater than 1.5 m) and those areas of less modified peat to be avoided where possible through the evolution of the design. Where possible, proposed wind turbines and site infrastructure would be located within areas with no peat or with peat less than 1.0 m deep. Where access tracks cannot avoid areas of deep peat, floating tracks have been incorporated into the design (see **Figure 7**). Further details of peatland habitat loss and habitat management proposals for restoring modified peatland habitat can be found in **Chapter 8: Ecology and Biodiversity**.

49. The proposed Development has also been designed to avoid any areas which may be subject to peat slide risk. The ground condition constraints that were considered in the design of the proposed Development were:

- identification of peat depths in excess of 1.5 m - to minimise incursion, protect from physical damage, minimise excavation and transportation of peat, reduce potential for peat instability and minimise potential soil carbon loss;
- identification of slope angles greater than 5° - to minimise soil loss and potential instability; and
- avoidance of areas where initial peat stability concern was identified where possible – to avoid areas with possible instability issues and associated indirect effects on surface water.

4.7. Archaeology and Cultural Heritage

50. Archaeology and cultural heritage constraints were identified at an early stage of the design process, and hard and soft buffers were established around them based on their relative importance/sensitivity, so that they could be avoided during the design process.

51. The buffers and interpretation of heritage assets' importance/sensitivity were further assessed during the course of the design and EIA process, in particular informed by archaeological site visits undertaken to establish the quality of the preservation of the remains within the Site.

52. Through the EIA scoping process and subsequently, the EIA team engaged with key heritage consultees such as Historic Environment Scotland to agree a basis for the assessment. Key messages arising from the consultations undertaken were fed back to the design team so that amendments could be made to address the feedback were possible. In particular, the Applicant modified the design between Layout A and Layout B by removing Turbine 11 from Layout A (located at NGR NX 96380, 94373) so that a greater level of separation was maintained to the scheduled monument of Poldivan Bridge Cairn, thereby reducing the impact on the setting of this designated asset.

53. The archaeological and cultural heritage effects of the proposed Development are addressed further in **Chapter 11: Archaeology and Cultural Heritage**.

4.8. Noise

54. For the purposes of early constraints mapping, avoidance buffers of 1 km were applied to inhabited residential properties in the vicinity of the turbine area. These buffers were refined further during the design process based on expert noise advice in order to reduce the risk of impacts on inhabited residential receptors.

55. An initial review of the baseline data surveyed for other windfarm schemes, and which are publicly available in the assessments for those schemes, suggests that existing baseline levels have been sufficiently defined for the purposes of an assessment of operational noise in accordance with ETSU-R-97 and best practice. Noise modelling was undertaken using these data for the proposed turbine layout at various stages of the design process, to predict the likely sound level which would result from the proposed Development at nearby residential properties.

56. The difference between measured background noise levels and predicted noise levels needs to be compliant with ETSU-R-97: 'The Assessment and Rating of Noise from Wind Farms' (Department for Trade and Industry (DTI), 1996) to avoid a significant impact.

Applying design criteria in accordance with ETSU guidance ensures that no exceedances of acceptable noise levels would occur for the proposed Development.

57. The noise effects of the proposed Development are addressed further in **Chapter 13: Noise**.

4.9. Forestry

58. The current land use of the Site is predominantly commercial forestry and existing forestry management plans for felling and planting across the Site have been considered in the design of the proposed Development. Forestry forms an integral part of the proposed Development as some trees would need to be felled, before planned plantation felling, around infrastructure positions to allow for construction of the development. **Technical Appendix 14.1** has been developed to show which areas of forestry that would be felled to facilitate the proposed Development, which of the felled areas can be restocked and the plans for Compensatory Planting.

59. This Site is largely stocked with middle aged conifers and the aim will be to carry out keyhole felling to accommodate the turbines wherever possible to avoid adverse environmental impacts; this will also minimise both the amount of felling and the area of Compensatory Planting that may be required, while at the same time incorporating areas of new native woodland and riparian planting. It is thought that keyhole felling as opposed to the alternative of clear felling would not have too great an impact on turbine efficiency due to the turbine dimensions proposed. Keyhole felling aims to avoid woodland loss wherever possible and where this is not achievable, to have the smallest possible keyhole and associated felling within afforested areas.

60. Further details on the proposed approach towards forestry management is provided in **Technical Appendix 14.1**.

4.10. Telecommunications

61. Consultation was undertaken with the relevant telecommunication link operators to inform the telecommunications links within the vicinity of the Site and to advise their position with respect to the proposed Development.

62. Consultation with Arqiva, Atkins, British Telecom (BT), the Joint Radio Company (JRC), Mobile Broadband Network Limited (MBNL) and Virgin Media O2 raised no issues which could have potentially affected the proposed Development.

63. Airwaves confirmed that they have an objection to the proposed Development as it would potentially interfere with a telecommunications link that they operate, which traverses the Site, and the location of a single turbine (Turbine 10 in Layout B, located at NX 96331, 92180) had the potential to interfere with the link.

64. The proposed Development layout was amended to avoid impacts to an identified Airwave telecommunications link through the turbine area.

65. The effects of telecommunications on the proposed Development are addressed further in **Chapter 14**.

4.11. Shadow Flicker

66. As stated for noise in Section 4.8 above, avoidance buffers of 1 km were applied to inhabited residential properties in the vicinity of the turbine area. This also served to reduce the frequency and likelihood of shadow flicker effects being encountered by residents. Further information on shadow flicker effects can be found in **Chapter 14.**

5. Consultation and Scoping

67. Consultation was undertaken as part of the EIA process to seek a comprehensive understanding of the requirements and views of the consultees. Consultation comprised two rounds of public consultation in the form of Public Information Events (PIEs) undertaken in June 2023 and September 2024. Further information on the consultation process and how this has helped shape the proposed Development can be found in the **Pre-Application Consultation Report**, submitted in support of this application.

68. An EIA Scoping Report was submitted to the Energy Consents Unit (ECU) in March 2023 to accompany a request for the Scottish Ministers to adopt a Scoping Opinion under Regulation 15 of the EIA Regulations 2017. The Scoping opinion was received from the ECU in November 2023. A summary of the key issues raised in the Scoping Opinion is provided in **Technical Appendix 6.1**. The Scoping Opinion is detailed in the consultation tables within the EIA Report **Chapters 7 to 14**, with reference on how the comments have been addressed.

69. In order to inform the cumulative impact assessment, cumulative Zones of Theoretical Visibility (ZTVs) were produced for all windfarms within 45 km of the proposed Development to identify the windfarms to which the proposed Development could cause significant cumulative impacts. It was then decided which win farms should be take forward to the detailed cumulative assessment.

6. Design Evolution

6.1. Consideration of Alternatives

70. The proposed Development has gone through four principal iterations of the layout (the initial layout and three subsequent iterations), which have been developed at different stages in the project design process. Layouts A to D, shown on **Figure 6a**, illustrate the four layouts and visually illustrates how the design has evolved through the design stages of the EIA process. A summary of the evolving layouts and design and the reasons for the changes are presented in **Table 6.1**.

Table 6.1 Description of Turbine Area Design Evolution Stages

Layout	Number of Turbines	Tip Height (m)	Comments
Layout A: Scoping Layout	13	220	Feasibility studies were undertaken in February 2023, prior to detailed surveys necessary for the EIA commencing. This layout formed the basis of the EIA Scoping Report submitted in March 2023.
Layout B: Design Workshop Layout	14	220	Informed by environment constraints data and wind turbine parameters instructed by the Applicant.
Layout C: Chilled Layout	13	220	A 13-turbine layout of up to 220 m to tip, responding to field data collated for the Site up to November 2024, scoping and

Layout	Number of Turbines	Tip Height (m)	Comments
			public consultation responses, alongside further advanced onsite environmental surveys and visual analysis
Layout D: Frozen Layout	12	200 – 220	12-turbine layout of up to six turbines of up to 200 m to tip and six of up to 220 m to tip, informed by detailed multidisciplinary assessment, and including locations of ancillary infrastructure.

6.2. Design Iterations: Turbine Area

6.2.1. Layout A: Scoping Layout

1. In February 2023, a feasibility study was undertaken on behalf of the Applicant which concluded that the Site had a potential to accommodate up to 13 turbines of a tip height of up to 220 m.

2. The feasibility study layout formed the basis of the layout presented for the EIA Scoping Request for the proposed Development, which was published by the ECU on 16th March 2023. The EIA Scoping Report that accompanied the request also identified that the Site had the potential to accommodate a battery energy storage system (BESS) in addition to the onshore wind turbines and associated infrastructure.

6.2.2. Layout B: Design Workshop Layout

3. Following EIA scoping, an initial constraints assessment and updated design was prepared, consideration of candidate turbine design parameters, energy yield, and a variety of environmental assessments undertaken from 2022 through the summer of 2023. The environmental assessments included but were not limited to:

- ornithological and bat surveys;
- environmental data provided by the landowner, Forestry and Land Scotland;
- establishing a 2 km buffer from the village of Ae to the turbines;
- ecological habitat surveys;
- phase 1 peat depth probing;
- telecommunications assets; and
- initial consideration of the impacts on the setting of cultural heritage assets in the vicinity of the turbine area.

4. As a result, the proposed layout was amended in the summer of 2023. Initially, locations for up to 19 turbines were identified. Through a process of collaboration and review, the design was refined to 14 turbines of up to 220 m to tip, as presented in **Figure 6a** as Layout B. The turbines were not renumbered to reflect the reduced number of turbines until later in the design evolution. The Application Boundary was amended at its north-western end so that it was not located within Dumfries and Galloway Thornhill Uplands RSA.

6.2.3. Layout C: Chilled Layout

5. Following the identification of a potential 14-turbine layout in June 2023, the project team consulted with consultees, including HES, SEPA, and NatureScot. The team considered feedback from public consultations held in June and July 2023, engaged with local community councils in autumn 2023, and reflected on the EIA Scoping Opinion and individual responses from consultees. The suite of surveys committed to in the EIA Scoping Report continued through the summer and autumn of 2023 and informed the updated layout. Particular considerations included:

- Groundwater Dependent Terrestrial Ecosystems;
- the results of fish and aquatic invertebrate surveys;
- a site visit undertaken by the lead archaeologist to ascertain the level of preservation of known assets within the turbine area;
- exploring opportunities to reduce potential impacts on the settings of the Scheduled Monument of Poldivan Bridge Cairn;
- private water supplies;
- consideration of landscape and visual effects from key views;
- an Airwave emergency telecommunications link; and
- noise modelling.

6. A second design workshop was undertaken in November 2023. Its purpose was to identify suitable locations for both the proposed turbines as well as the related infrastructure such as connecting access tracks, the substation, and construction compounds, in the light of the further information gathered. The outcome of the chilled design was a 13-turbine layout, with connecting new and upgraded access tracks, construction compounds, a substation and meteorological mast location.

6.2.4. Layout D: Frozen Layout

7. A frozen design was achieved in July 2024 following Phase 2 peat probing of the whole of the chilled design footprint, further amendments to the design to avoid localised areas of deep peat, adjusting construction compound locations to reflect the proposed access track to the turbine area, confirmation of a roads design specification, and negotiation and agreement with Forestry and Land Scotland over the use of its existing quarries within the Site for the purposes of construction of the proposed Development.

8. Following further fieldwork and collaboration, it was decided to remove the most northerly turbine “T12” from the design so that the proposed Development would appear as a more coherent whole in views towards the Site and to reduce landscape and visual impact. The Application Boundary was amended so that the Galloway and Southern Ayrshire Biosphere Reserve in the north-western portion of the Site was removed, the Scheduled Monument of Poldivan Bridge Cairn in the north-eastern area was omitted from the Site, and a proposed area of riparian planting to the east of the access track to the turbine area was added (see **Figure 7**).

9. To further reduce impacts on nearby residential and landscape receptors, the maximum height of the turbines was also reduced, with turbine T1, T2, T5, T6, T9 and T10 to be a maximum of 200 m to tip and the remaining turbines T3, T4, T7, T8, T11 and T12 at a maximum of 220 m to tip.

10. The turbines were renumbered at this stage to run sequentially from 1 to 12. The frozen design and finalised turbine numbering are shown in **Figure 7** as well as in Layout D – Frozen Layout on **Figure 6a.**

6.3. Design Iterations: Access to Turbine Area

11. During the design evolution of the proposed Development, four options for the delivery of abnormal indivisible loads (AILs) were considered for the proposed Development. These are presented in **Figure 6b.**

12. The four options considered were as follows:

- Option 1: Ae Village;
- Option 2: Craigshields;
- Option 3: Capel Water; and
- Option 4: Capel Water with Shortcut.

13. The key points of these are summarised below.

6.3.1. Access Track Option 1: Ae Village

14. This option led from the A701 south of the village of Ae at Ae Bridgend, coming through Ae and accessing the turbine area north of Windyhill. This option was discounted at an early stage of the design process due to the potential disruption it would cause to local residents in the village of Ae.

6.3.2. Access Track Option 2: Craigshields

15. This option led from the A701 public road at the existing Harestanes Windfarm access point to the east of Ae village, through part of the operational Harestanes Windfarm, crossing the Water of Ae and close to the Forestry and Land Scotland (FLS) properties of Craigshields and Knockenshang. Following detailed environmental and engineering surveys, this option was not taken forward due to the extensive new watercourse crossing within challenging terrain that would have been required over the Water of Ae, and the recreational interests of FLS near the proposed route.

6.3.3. Access Track Option 3: Capel Water

16. This option led from the A701 public road at the existing Harestanes Windfarm access point to the east of Ae village, through the operational Harestanes Windfarm, along the existing FLS forestry access tracks north of Muir Hill, Hareshaw Rig and Queensberry before extending southwards to cross the Bran Burn and Capel Water. Following an assessment of Options 1, 2 and 3, this option was not taken forward due to the length of the delivery route in comparison with Options 1 and 3, which would have required a more extensive network of access tracks and existing watercourse crossings to be upgraded and pose

logistical and health and safety challenges during construction due to the time and distance required to access the Site.

6.3.4. Access Track Option 4: Capel Water with Shortcut

17. This option led from the A701 public road at the existing Harestanes Windfarm access point to the east of Ae village, through the operational Harestanes Windfarm, along the existing FLS forestry access track east of Muir Hill, before crossing the Water of Ae, Bran Burn and Capel Water. This option was selected for the "frozen" design shown in **Figure 7** as the disruption to local residents would be less than for Option 1, and the environmental, engineering and health and safety factors were assessed as being less challenging than would be the case for Options 2 and 3. Following confirmation of the proposed access track to the turbine area, the location of a construction compound and an opportunity to use an existing FLS quarry were identified along its route, as shown in **Figure 7.**

7. Proposed Development

18. The proposed Development is described in detail in **Chapter 3** of the EIA Report. An outline Construction and Environmental Management Plan (CEMP) is also contained in the EIA Report as **Technical Appendix 3.1**. The layout of the proposed Development is illustrated in **Figure 7**. In summary the proposed Development would comprise of the following:

- 12 wind turbines, six with a maximum height of 220 m and six with a maximum height of 200 m to blade tip, including foundations and aviation lighting;
- hardstanding areas at the base of each turbine, with an approximate total area of 3,856 m^2;
- transformer/switchgear housings located adjacent to turbines;
- site entrance from the A701, and 31.5 kilometres (km) of access track with associated watercourse crossings – of which 10.5 km are new access tracks and 21.0 km are upgrades to existing tracks;
- underground cabling linking the turbines with the substation;
- a permanent power performance assessment (PPA) anemometry mast and associated hardstanding area;
- an operations control building with parking and welfare facilities;
- a substation compound;
- a bellmouth and parking area adjacent to the A701;
- two construction compound areas;
- extraction of material from up to three existing quarries owned and operated by Forestry and Land Scotland to provide suitable rock for access tracks, turbine bases and hardstanding;
- health & safety and other directional site signage; and

- additional development components to improve the overall ecological and environmental and social benefits accruing from the proposed Development, such as peatland restoration; habitat improvement and native woodland planting

8. Access

8.1. Offsite Access Route

19. Access to the Site is via the existing access junction on the A701 used for the existing Harestanes Windfarm.

20. It is proposed that all vehicular traffic would use this access, including Abnormal Indivisible Loads (AIL). No heavy goods vehicles (HGV) access is anticipated to be taken through the village of Ae, however there may be limited light good vehicles (LGV) during the initial enabling upgrading works on the access route. Following competition of the wider access track, all traffic will access the Site from the A701 junction and no further traffic will pass through the village of Ae.

21. As part of the development a detailed Construction Traffic Management Plan and Abnormal Load Assessment would be prepared which would identify the requirements for any road modifications, vegetation or tree trimming required along the access road.

22. The proposed Development also includes an upgraded site entrance which is designed to safely allow the delivery of wind turbines and construction materials.

8.2. Onsite Access Tracks

23. Approximately 31.5 km of access track including approximately 21.0 km of upgraded track would be required to provide access to the wind turbines, control building compound, solar array and construction compound.

24. Tracks would have a 5.5 m running width, which would be increased according to comply with the turbine supplier's access requirements on bends and at junctions. Where it is not possible to avoid areas of deepest peat, floating track construction would be used. It is anticipated that there would be approximately 1,504 m of floating track, where consistent peat depths of between 1.2 m or greater are identified along with shallow topography in the area (below 5%).

25. Construction passing places would be placed along the track in addition to passing opportunities at site junction and crane hardstanding, the exact locations of these would be determined prior to construction.

8.3. Public Access

8.3.1. Recreational Enhancements

26. The Applicant is committed to providing a variety of other benefits above and beyond the renewable energy infrastructure and habitat enhancement identified above. These are identified by component below. The features would be constructed at or around the same time as the other elements of the proposed Development, with the aim of them becoming available to use by members of the public at the commencement of the operational phase

of the proposed Development. The responsibility for installing and maintaining these features would lie with the Applicant for the duration of the operational life of the proposed Development, though the Applicant would likely choose to engage with local third parties to provide both the construction and maintenance of them.

27. The socio-economic effects of the proposed Development are discussed in the **Socio-Economics Impact Assessment Report.**

8.3.2. Pedestrian Access

28. Members of the public would be able to walk up to the base of the wind turbines, but it is not proposed that there would be public access into the towers. Due to health and safety reasons access to the towers would be restricted to employees of, and contractors appointed by the Applicant. Changes to access arranges within the Site will be detailed in an Access Management Plan prepared in advance of construction commencing. These will include an arrangement for communicating changes in access to relevant stakeholders.

8.3.3. Vehicular Access

29. Once the proposed Development is operational (if consent is granted) vehicular access will be limited to individuals directly involved in the maintenance of the proposed Development, the landowner and the agent, e.g. for ongoing forestry activities, and emergency vehicles.

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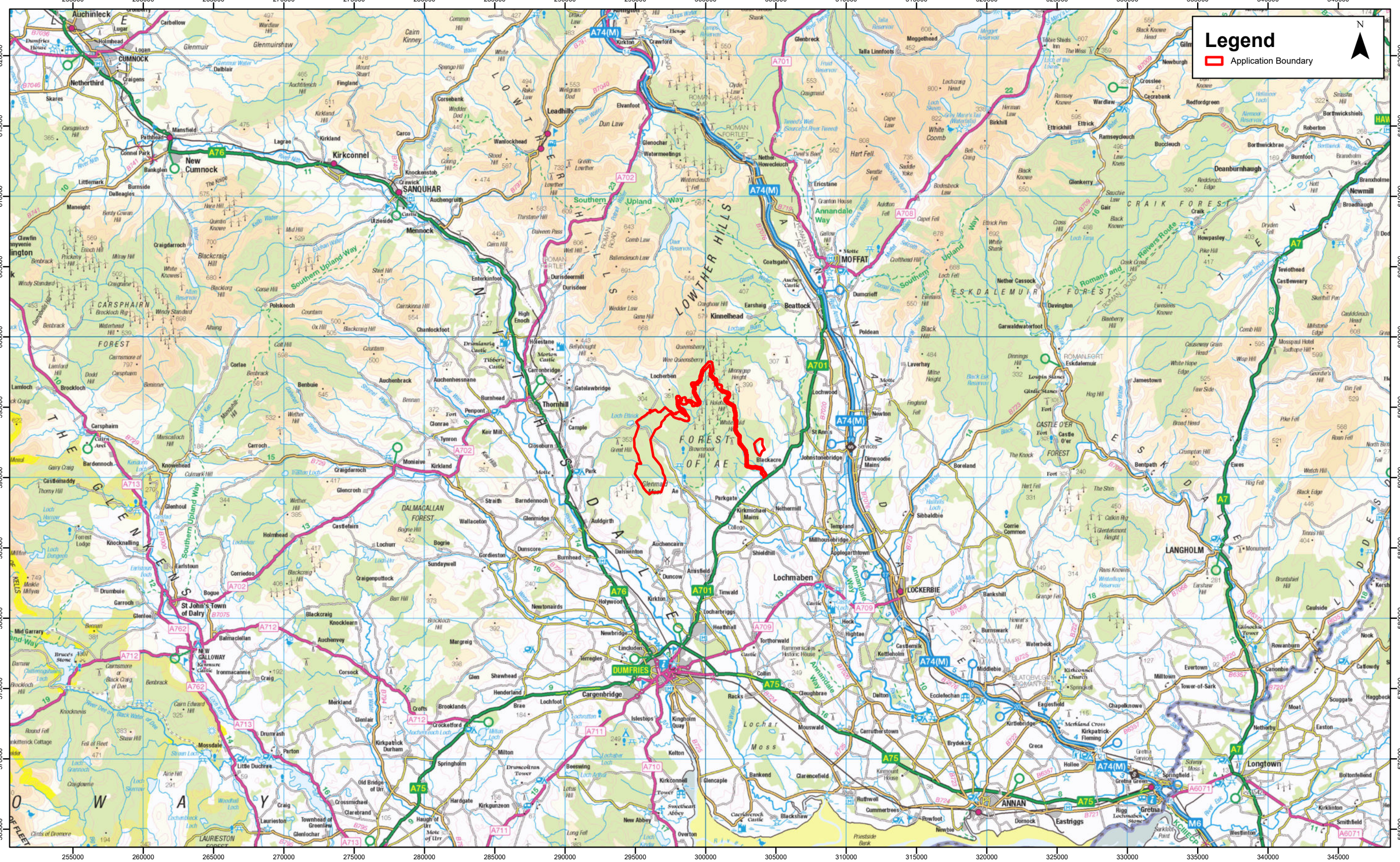
ScottishPower Renewables					1:40,000 Scale @ A3	0 1 2 Km
	B	27/11/24	DL	Revised Application Boundary	© Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community	
	A	16/10/24	DL	First Issue.		
	Rev	Date	By	Comment		

Harestanes West Windfarm

Figure 1:
Site Aerial Context

Drg No	HSTW-RSK-I-076	
Rev	B	Datum: OSGB36 Projection: TM
Date	27/11/24	
Figure	1	

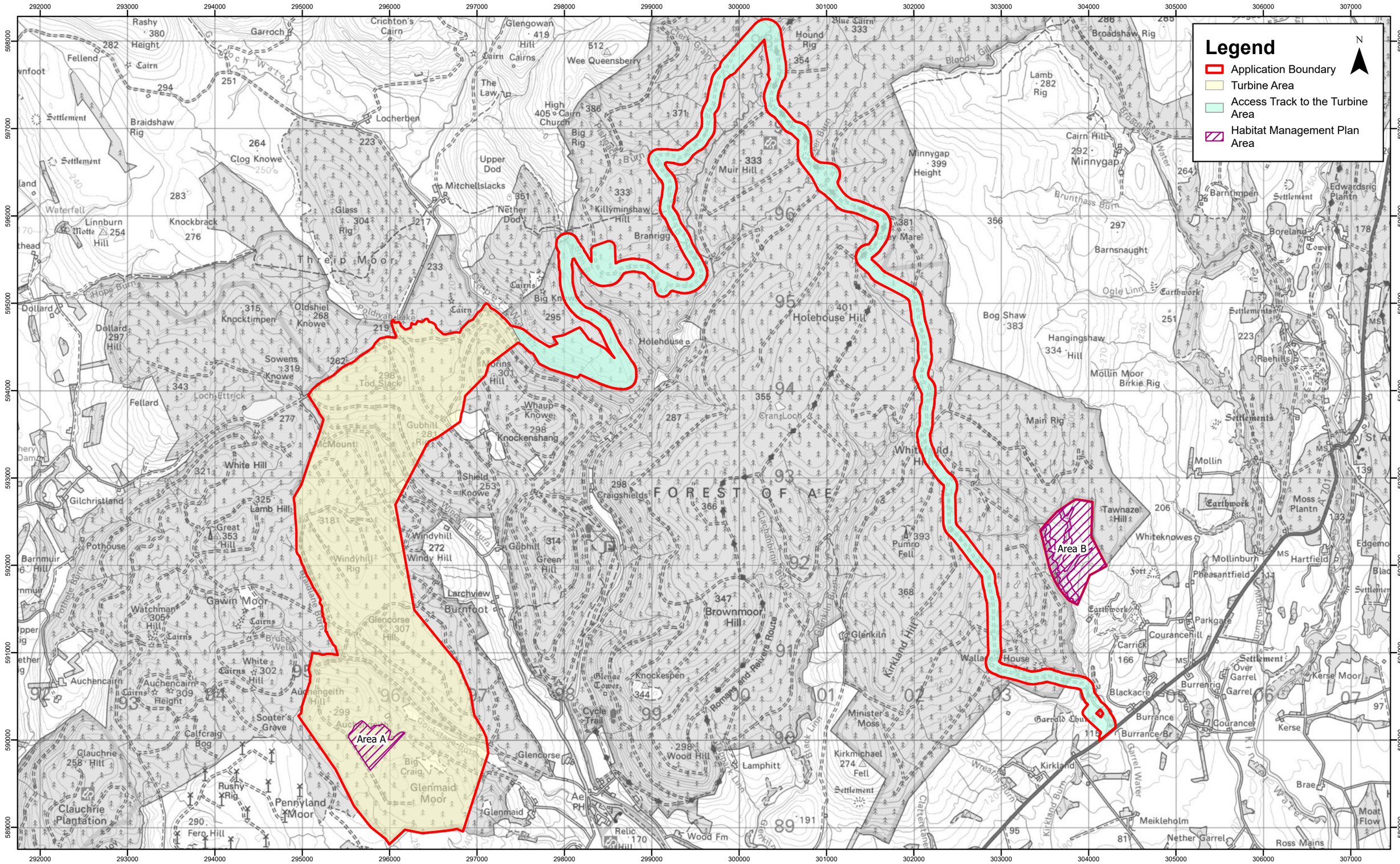


ScottishPower Renewables				1:250,000 Scale @ A3	0 5 10 Km
B	27/11/24	DL	Revised Application Boundary		
A	16/10/24	DL	First Issue.		
Rev	Date	By	Comment		

Harestanes West Windfarm

Figure 2:
Site Context

Drg No	HSTW-RSK-I-077	
Rev	B	Datum: OSGB36 Projection: TM
Date	27/11/24	
Figure	2	



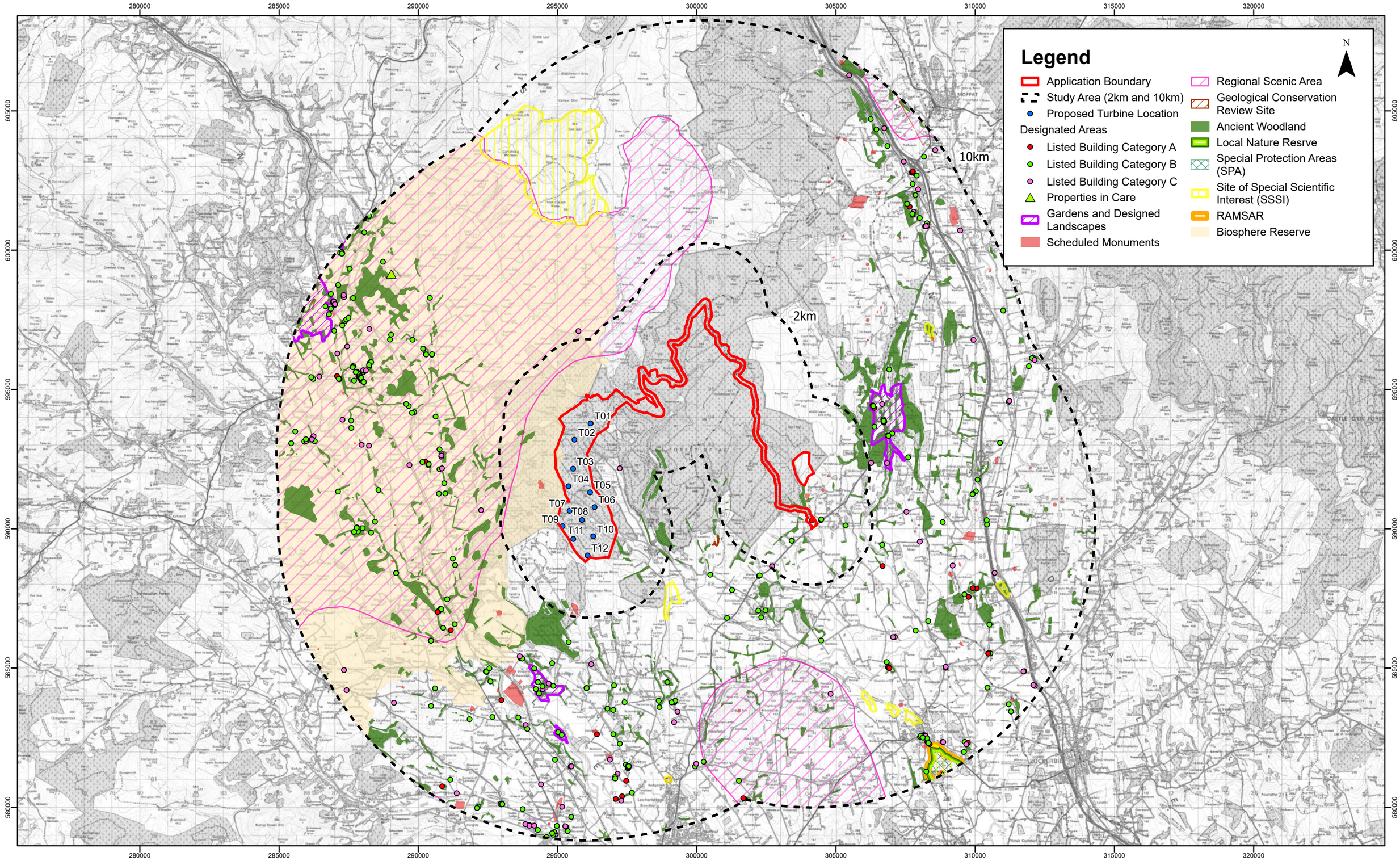
ScottishPower Renewables					1:40,000 Scale @ A3	0 1 2 Km
	B	27/11/24	DL	Revised Application Boundary		
	A	16/10/24	DL	First Issue.		
	Rev	**Date**	**By**	**Comment**		

Harestanes West Windfarm

Figure 3:
Application Boundary

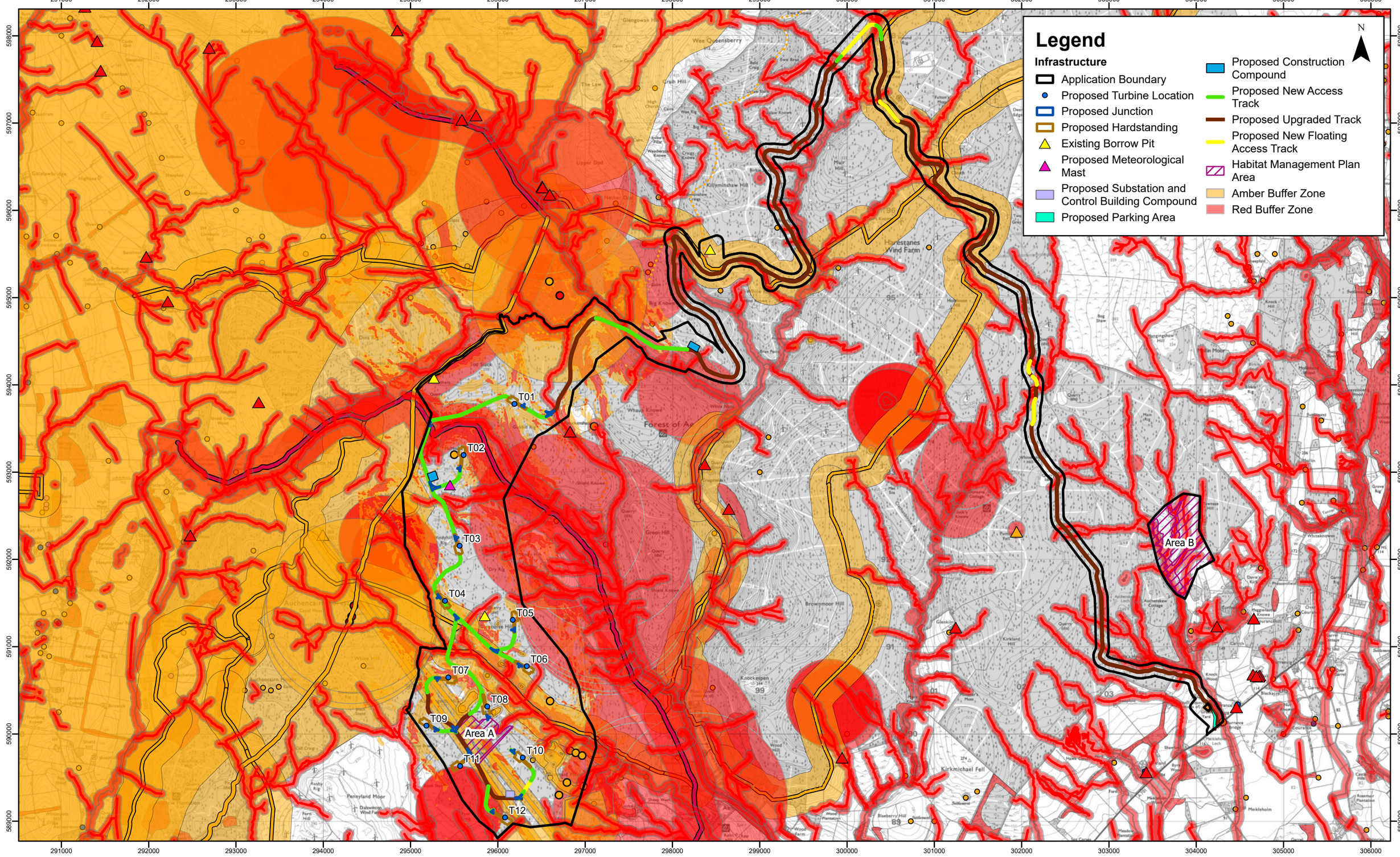
Drg No	HSTW-RSK-I-078
Rev	B
Date	27/11/24
Figure	3

Datum: OSGB36
Projection: TM



ScottishPower Renewables	C	27/11/24	DL	Revised Application Boundary	1:125,000 Scale @ A3	0 3.75 7.5 Km	**Harestanes West Windfarm** Figure 4: Environmental Designations
	B	31/10/24	FF	Updated layers			
	A	16/10/24	DL	First Issue.			
	Rev	**Date**	**By**	**Comment**			

Drg No	HSTW-RSK-I-079
Rev	C
Date	27/11/24
Figure	4
Datum: OSGB36 Projection: TM	



ScottishPower Renewables

Rev	Date	By	Comment
B	27/11/24	DL	Revised Application Boundary
A	16/10/24	DL	First Issue.

1:40,000 Scale @ A3

0 0.5 1 2 Km

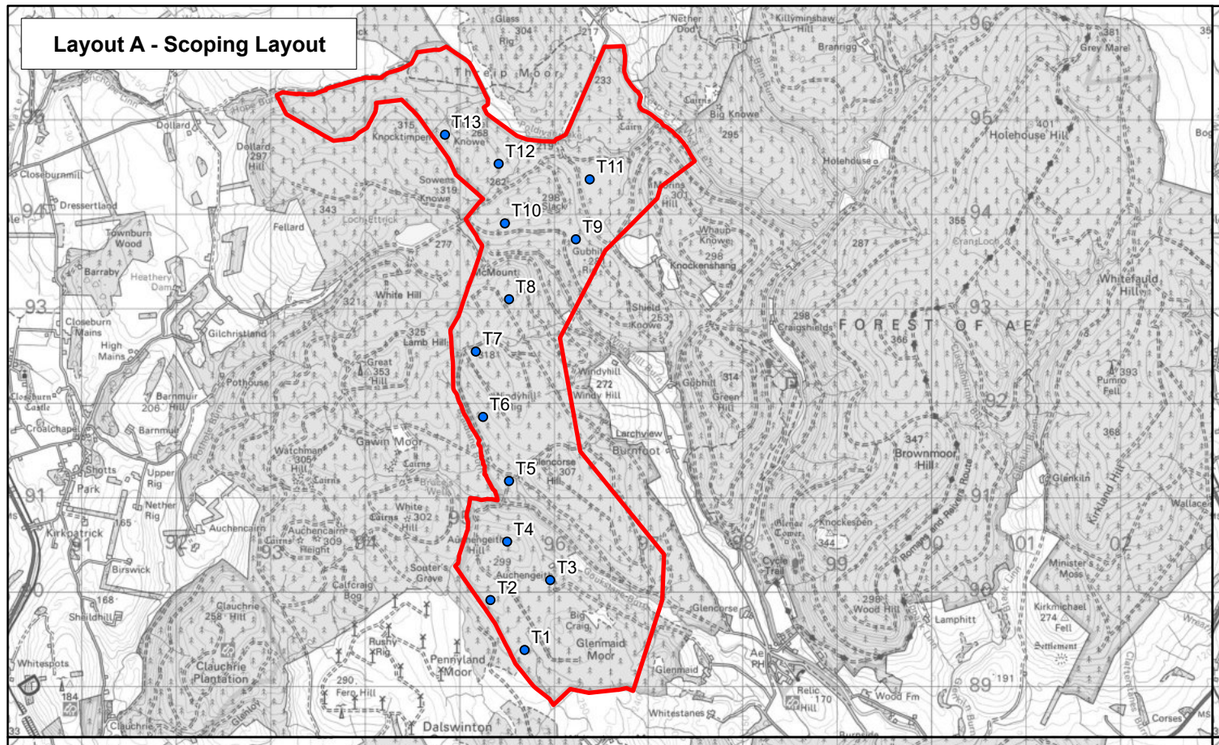
Harestanes West Windfarm

Figure 5
Onsite Constraints Heat Map

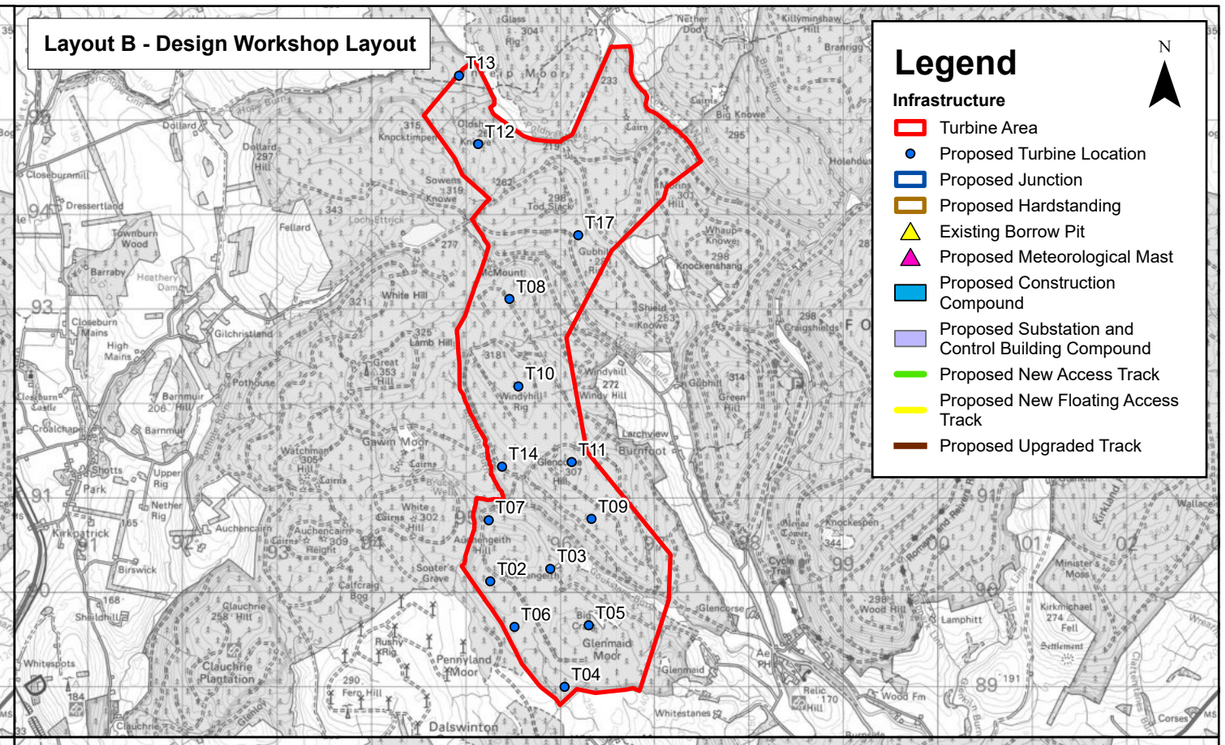
Drg No	HSTW-RSK-I-080
Rev	B
Date	27/11/24
Figure	5

Datum: OSGB36
Projection: TM

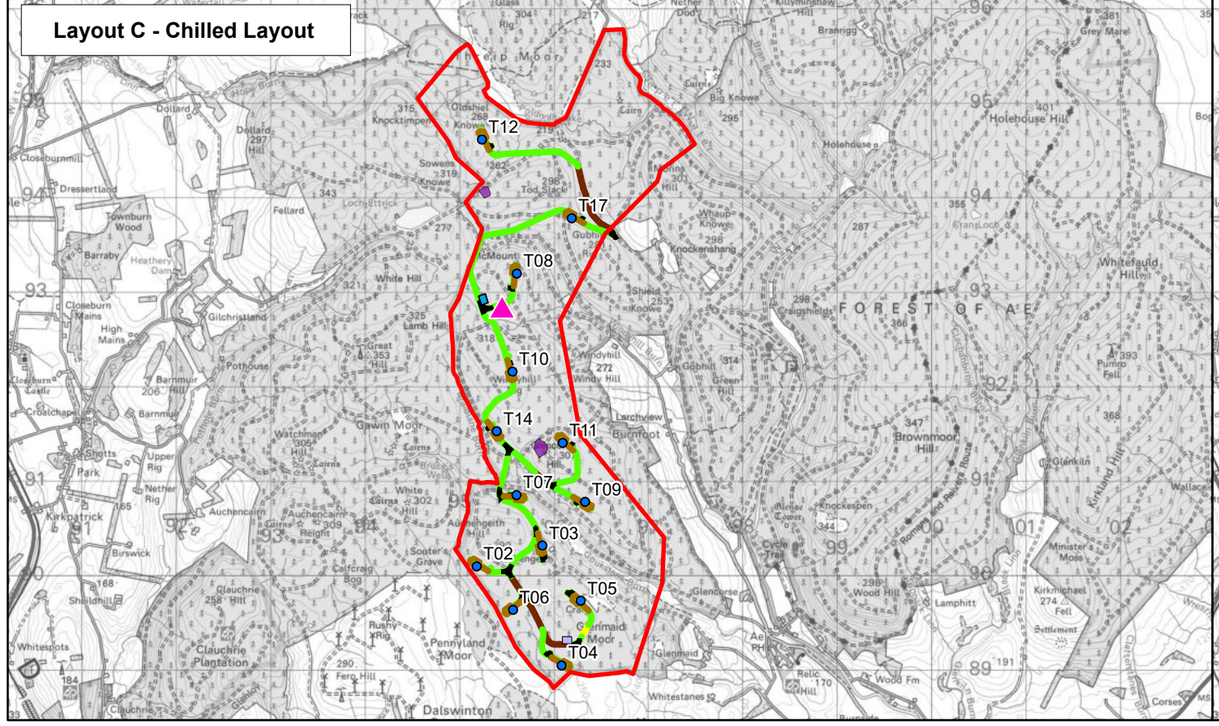
Layout A - Scoping Layout



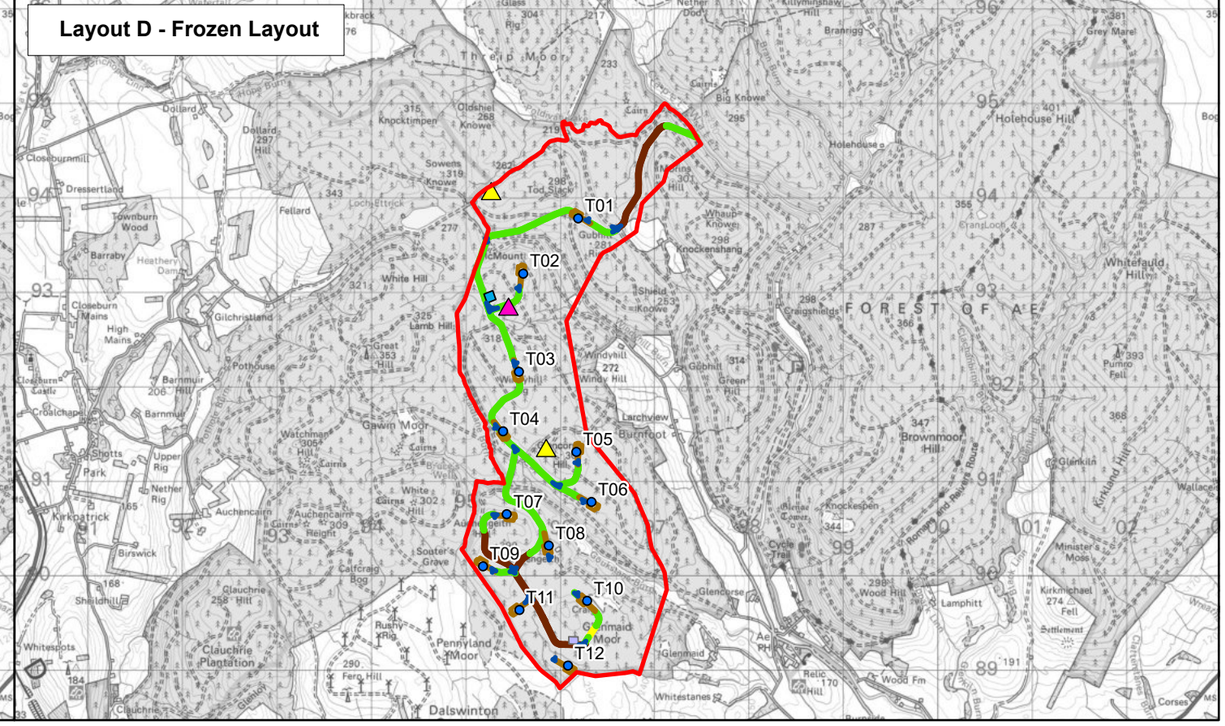
Layout B - Design Workshop Layout



Layout C - Chilled Layout



Layout D - Frozen Layout



Legend

N

Infrastructure

- Turbine Area
- Proposed Turbine Location
- Proposed Junction
- Proposed Hardstanding
- Existing Borrow Pit
- Proposed Meteorological Mast
- Proposed Construction Compound
- Proposed Substation and Control Building Compound
- Proposed New Access Track
- Proposed New Floating Access Track
- Proposed Upgraded Track

ScottishPower Renewables

Rev	Date	By	Comment
B	27/11/24	DL	Revised Legend
A	16/10/24	DL	First Issue.

1:65,000 Scale @ A3

0 2 4 Km

Harestanes West Windfarm

Figure 6a:
Design Iterations: Turbine Area

Drg No	HSTW-RSK-I-081
Rev	B
Date	27/11/24
Figure	6a

Datum: OSGB36
Projection: TM

Option 1 - Ae Village

Option 2 - Craigshields

Option 3 - Capel Water

Option 4 - Capel Water with Shortcut

Legend

N

Infrastructure

- Application Boundary
- Option 1 Ae Village
- Option 2 Craigsheilds
- Option 3 Capel Water
- Option 4 Capel Water with Shortcut

ScottishPower Renewables

Rev	Date	By	Comment
C	27/11/24	DL	Revised Application Boundary
B	01/11/24	FF	Revised Option 1 Access Track
A	16/10/24	DL	First Issue.

Scale @ A3

Map Option 1, 2 & 4 1:80,000 — 0 1.5 3 Km

Map Option 3 : 1:100,000 — 0 2 4 Km

Harestanes West Windfarm

Figure 6b:
Design Iterations: Access Track

Drg No	HSTW-RSK-I-082
Rev	C
Date	27/11/24
Figure	6b

Datum: OSGB36
Projection: TM

Legend

Infrastructure

- Application Boundary
- Proposed Turbine Location
- Proposed Hardstanding
- Proposed Junction
- Existing Borrow Pit
- Proposed Meteorological Mast
- Proposed Substation and Control Building Compound
- Proposed Construction Compound
- Proposed Parking Area
- Proposed New Access Track
- Proposed New Floating Access Track
- Proposed Upgraded Track
- Habitat Management Plan Area

N

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12

Mitchelslacks

Quarriebraes

Branrigg

Area A

Area B

Rev	Date	By	Comment
B	27/11/24	DL	Revised Legend
A	16/10/24	DL	First Issue.

1:40,000 Scale @ A3

0 1 2 Km

Harestanes West Windfarm

Figure 7:
Proposed Site Layout

Drg No	HSTW-RSK-I-083
Rev	B
Date	27/11/24
Figure	7

Datum: OSGB36
Projection: TM