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Section 8: Ecology

8.1 Introduction

- 8.1.1 This report provides updated Additional Information (AI) on the Ecology chapter of the Ecological Impact Assessment (EcIA) of the proposed Scoop Hill Community Wind Farm development.
- 8.1.2 This AI has been provided due to the alteration of the wind farm layout. Overall, 17 wind turbines have been removed with 2 new turbines added in which are located within the forestry, and a further 4 turbines have been reduced in height. This has resulted in a significant reduction in the amount of access tracks required. There has also been 2 borrow pits removed, 3 borrow pits relocated and 1 temporary construction compound removed.
- 8.1.3 This AI Ecology chapter therefore updates any potential impacts from the development proposals on the ecology of the site as originally detailed in Section 8: Ecology of the EIAR submitted in November 2020, and therefore they should be read in conjunction with each other.
- 8.1.4 This report also addresses comments expressed by NatureScot in their consultation response dated 21st July 2021, with regards to ecology, along with other consultee comments provided during the consultation process.

8.2 Consultation Response

8.2.1 NatureScot comments on the EcIA (dated 21st July 2021) have been taken into consideration when working on the redesign of the layout. These comments are summarised in Table 1, along with details of the actions/responses on behalf of the Applicant from Community Windpower Ltd (CWL). Some of the NatureScot comments are related to species protection and mitigation and these are discussed in further detail within the revised Outline Habitat Management and Enhancement Plan (OHMEP) which has been submitted as part of the Al.

Table 1 - NatureScot comments on ecology with CWL responses

| NatureScot Comments | Starling Learning Response |
|---|---|
| Statutory Designated Sites | NatureScot do state that the development is unlikely to |
| The nearest turbine, T54, will be approximately | affect the SSSI, even with the proposed micro-siting |
| 400m from the Dryfe Water SSSI. This could be | allowance, and the ECoW and construction company will |
| reduced to 300m if a micro-siting allowance of | ensure this is the case, with the SSSI protected at all |
| 100m is allowed as requested by the applicant | times. |
| in EIA Section 2 Detailed Project Description. | In addition, turbine 54 has been removed from the site, |
| | thus the separation distance to the nearest turbine (T51) |
| | has been increased to 525 metres, prior to any micro- |
| | siting. |
| Habitats | All NVC maps can be provided on a USB, both from this AI |
| The NVC data was not presented in map form. | and the original EcIA, as due to the size of the area |
| | covered the level of detail is difficult to see on a map. |
| Bats | |
| From looking at the proposed layout the onsite | The bat roost at Finnegill is just under 500m from the |
| roost is located over 300m from the nearest | nearest turbine T46. |

| proposed infrastructure, therefore it is unlikely | |
|---|------|
| that there will be any impact to this roost and a | |
| bat license is not currently required at this | |
| facility. | |
| | |
| Data was not presented in a format outlined in | Fur |
| 2019 guidance. | bat |
| | thi |
| NatureScot recommends feathering the blades | |
| at low wind speeds as this reduces the risk to | Fea |
| bats from collision | inc |
| | pri |
| | pre |
| Otters | Ott |
| Buffer for disturbance of otters should be 200m | but |
| if a breeding holt, reduced to 100m depending | 100 |
| on the nature of the disturbance. | mi |
| | str |
| Badgers | Ba |
| Badger setts require a 30m buffer, 100m for pile | but |
| driving and blasting. | neo |
| Water Vole | Sur |
| No evidence of water vole was found but the | cor |
| situation can change over time. Recommend | ОН |
| that any suitable habitats should be surveyed | |
| for water vole in conjunction with the other | |
| pre-construction surveys. | |
| Fish | SEE |
| With regard to migratory salmonids and | foll |
| watercourses all works should be carried out in | |
| line with SEPA's Pollution Prevention | |
| Guidelines | |
| All protected species | Pre |
| Protected species are mobile and the situation | nrc |
| can change over time | |
| cuir chunge over time. | sta |
| Recommend that pre-construction surveys | adv |
| should be completed as close to the | if r |
| construction period as possible, and no more | |
| than 2 months before the start of the works | |
| NaturaScot advices that the developer follows | A 11 |
| guidance for protected species during | All |
| guidance for protected species during | |
| construction. | See |

orther information, following the 2019 guidance, on ats is provided, see Section 8.7.8 and Appendix 8.3 of is AI.

eathering of the blades at low wind speeds will be cluded in the package of mitigation measures for bats, imarily in the areas where bats are known to be resent.

ter survey will be carried out pre-construction. The ffer will be changed to 200m and only reduced to 0m if considered suitable and a buffer of 30m inimum of non breeding holt or other protected ructure such as a lie up. See OHMEP for more details. dger survey will be carried out pre-construction and ffers put in place. A licence will be applied for if

cessary. See OHMEP for more details.

rveys for water voles will be carried out prenstruction at the same time as the otter survey. See HMEP for more detail.

PA's Pollution and Prevention Guidelines will be llowed. See OHMEP for more details.

e-construction Surveys will be carried out for all otected species, no more than 3 months prior to the mmencement of construction. If a change in their atus is found, suitable mitigation will be put in place as vised by the ECoW, and NatureScot licences applied for required. See OHMEP.

these guidance documents will be adhered to by CWL, e ECoW and the appointed contractors. e OHMEP. 8.2.2 Other consultees have also provided comments in relation to Ecology, these responses are summarised below with details of the actions/responses from CWL.

Table 2 – EIAR consultees responses with CWL responses

| | · · | | | greater than original location, withi |
|-------------------------------------|---|---|--|---|
| Consultee | Consultee response and requests | CWL Response | | areas hosting GWTDE and within buffers for private water supplies. |
| Fisheries Management Scotland | Development falls within catchment Annan District Salmon Fishing Board. States the advice and guidelines they provide to protect fish species. | Noted. Noted. | | Recommends that the Habitat Management Plan (HMP) is refined include more information on propo future monitoring. |
| (23/11/2020) | Commenting on behalf of Annan District Salmon | | | Recommends that a site survey for Invasive Non-Native Species (INNS) any INNS are identified, a biosecurit plan should form part of the CEMP |
| | Fishery Board. | | | subsequent construction licence. |
| Galloway Fisheries Trust | Development falls within the Annan catchment where numerous watercourses flow across the development site. The Dryfe Water and Wamphray Water are the main sub- catchments within the wind farm site | 1. Noted | | SEPA removed their objection subsequent the planning conditions outlined above follo the provision of additional information correspondence with the applicant. |
| (04/01/2021) | Support the CEMP and would appreciate the opportunity to comment on Watercourse Crossing Plan. | 2. Noted | SEPA | 1. Considered the additional information supplied and noted that there are a areas of high and medium GWDTE within 250m of the development. S acknowledge and are satisfied with proposed mitigation measures and |
| | 3. Support the HMP and would like the opportunity to provide input on the HMP Plan. Additionally, the Trust request that the proposed education work includes projects themed on fish and riverine babitats. | 3. Noted | (25/06/2021) | request that these measures are included within the CEMP. Notes th the small flushes, too small to map M10 habitat should be protected fr damage. |
| | SEPA Objected to the application in December 2020. | Response Letter sent by the applicant: Addressing concerns and providing additional information. (06/03/2021) | | Outline HMP – SEPA notes that it is intended to plant Dawn Redwood a part of a native screening belt. SEPA notes that this is not a native specie |
| SEPA (22/12/2020) | Objects on grounds of lack of information regarding GWDTE. While satisfied in principle with the GWDTE assessment and mitigation outlined in section 8.13.6 of the original EIAR, SEPA requested an NVC map specifically covering infrastructure and relevant buffers to be supplied. | Noted – NVC mapping and associated data provided in conjunction with the response letter. | North Milk Community Council (21/01/2021) | Objects to the application 1. Dryfe Water SSSI – Concerns silt fro the development will choke the stre and rivers. The River Annan and Dry are important spawning beds for salmon and sea trout. Other species such as frogs will also be impacted of |

| 2. | In regard to micrositing, SEPA requests a planning condition requiring that no micrositing will take place within 50m of a watercourse, in areas of peat depth greater than original location, within areas hosting GWTDE and within buffers for private water supplies. | In CWL's letter to SEPA it was confirmed that the applicant would agree to a condition in relation to micrositing as set out in section 7 of SEPAs response. |
|------|---|--|
| 3. | Recommends that the Habitat Management Plan (HMP) is refined to include more information on proposed future monitoring. | The OHMEP submitted as part of the EIAR and updated in the AI will be further refined post consent. The HMEP will be agreed on with the Habitat Management Group. |
| 4. | Recommends that a site survey for Invasive Non-Native Species (INNS) IF any INNS are identified, a biosecurity plan should form part of the CEMP and subsequent construction licence. | 4. Noted |
| A r | emoved their objection subsequent to | |
| plai | nning conditions outlined above following ovision of additional information and | |
| resp | ondence with the applicant. | |
| 1. | Considered the additional information supplied and noted that there are a few areas of high and medium GWDTE within 250m of the development. SEPA acknowledge and are satisfied with the proposed mitigation measures and request that these measures are included within the CEMP. Notes that the small flushes, too small to map and M10 habitat should be protected from damage. | 1. Noted. |
| 2. | Outline HMP – SEPA notes that it is intended to plant Dawn Redwood as part of a native screening belt. SEPA notes that this is not a native species. | Noted, the screening belt is no longer proposed due to turbine changes. |
| ects | s to the application | |
| 1. | Dryfe Water SSSI – Concerns silt from the development will choke the streams and rivers. The River Annan and Dryfe are important spawning beds for salmon and sea trout. Other species such as frogs will also be impacted due | Final species surveys will be carried out prior to construction onsite. Information regarding habitat management and enhancement in relation to the SSSI can be found within the AI OHMEP. |

| | to the potential silting of rivers/streams. The proposed mitigation measures require robust, constant and effective maintenance. | | |
|----|---|----|---|
| 2. | Concerns expressed on the general detrimental impact on local wildlife, whatever mitigation is enacted, the proposed development will have lasting detrimental effects and damage on wildlife. | 2. | All the guidance documents will be adhered to by CWL, the ECoW and the appointed contractors. See OHMEP for further details. |

Methodology 8.3

Phase 1 Habitat Survey Update

- New areas have been added since the original EcIA and other areas have been removed including the 8.3.1 substantial amount of moorland on the northwest side of the site.
- 8.3.2 The new additional areas were mapped based on a 100m buffer around the proposed changes, following SEPA guidance for construction work involving shallow excavations. The new mapped data has been added to the existing data from previous iterations of the wind farm design and the whole data set can be viewed on a Geographic Information System (GIS).
- The Phase 1 Habitat Survey followed the standard methodology described in 'Guidelines for Baseline 8.3.3 Ecological Assessment'¹, which augments the methods described in the 'Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit'².
- 8.3.4 Each habitat was classified in the field and its extent mapped onto ordnance survey maps (1:25,000). Field 'target notes' were taken, using GPS to record grid coordinates, relating to record information regarding dominant plants, their associates, structure of vegetation, or points of general conservation/ecological interest, including the presence, or potential presence of notable or protected species on the site. Botanical nomenclature follows that of Stace. C.³.

National Vegetation Classification (NVC) Survey Update

- An NVC survey was also undertaken which included identification of wetland habitats that might include 8.3.5 Groundwater Dependent Terrestrial Ecosystems (GWDTEs).
- The survey was done concurrently with the Phase 1 survey, with NVC community names being attached to 8.3.6 those habitat polygons recorded as part of that.
- The habitat survey updates were carried out in October 2021 by Keith Watson of Starling Learning. 8.3.7

Protected Species Surveys

As the alterations were minimal, no further surveys were carried out for protected species. The access track 8.3.8 amendments and two new turbine locations are unlikely to alter the results significantly. Pre-construction checks for all protected species will confirm this and further suitable mitigation measures devised if required.

Ecological Impact Assessment (EcIA) Updated 8.4

This Additional Information (AI) should be read in conjunction with the original EcIA. 8.4.1

Phase 1 Habitats and NVC communities (Site Survey) 8.5

- Additional areas surveyed for the revised layout are described below and habitats where turbines have been 8.5.1 removed are also described. The updated total areas lost for each habitat type are given in Appendix 8.2 of this AI.
- 8.5.2 The following habitats were recorded during the Phase 1 Habitat survey. Some are too small to map and are therefore given as Target Notes in Appendix 8.1, with their locations shown in Al Figure 8.3L. Comments are made below on these small areas of habitat and the main habitats are described in Sections 8.5.3 to 8.5.32:
 - B1.1 Unimproved acid grassland (B Grassland and marsh);
 - B1.2 Semi-improved acid grassland (B Grassland and marsh); •
 - B2.1 Unimproved neutral grassland (B Grassland and marsh);
 - B2.2 Semi-improved neutral grassland (B Grassland and marsh); •
 - B4 Improved grassland (B Grassland and marsh);
 - B5 Marsh/marshy grassland (B Grassland and marsh);
 - B6 Poor semi-improved grassland (B Grassland and marsh);
 - D2 Wet dwarf shrub heath (D Heathland);
 - G2 Running water (G Open water);

³ Stace C. (2019) New Flora of the British Isles

- A1.1.1 Semi-natural broad-leaved woodland (A Woodland and scrub);
- A1.1.2 Broad-leaved plantation woodland (A Woodland and scrub);

¹ Guidelines for Ecological Impact Assessment in the UK and Ireland.(2018) CIEEM

² JNCC. (2010) Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough

- A1.2.2 Coniferous plantation (A Woodland and scrub); •
- A2.1 Scrub (A Woodland and scrub); •
- C1.1 Continuous bracken (C Tall herb and fern);
- J1.3 Ephemeral/short perennial. ٠
- The main Phase 1 habitats found during the survey are discussed in broad groupings in the following sections 8.5.3 and are shown on AI Figure 8.2 and the target notes on AI Figures 8.3a to 8.3k.

Grasslands and related open habitats

- A relic fragment of **B1.1 unimproved acid grassland** is found on a small ridge near the margins of the 8.5.4 Wamphray Water. Although **B1.1** is the largest habitat over the wider site for the proposed wind farm, it accounts for only a small proportion of the new additional area (0.0068ha). It was found to represent the typical sub-community of NVC U4 grassland, with the typical defining species: the grasses sheep's fescue Festuca ovina, sweet vernal grass Anthoxanthum odoratum and common bent Agrostis capillaris; tormentil Potentilla erecta and heath bedstraw Galium saxatile; and mosses such as Rhytidiadelphus squarrosus and Pleurozium schreberi.
- 8.5.5 On the higher slopes above the Wamphray and at some locations west of the River Annan where there are knolls or ridges, there are some larger extents (c3.2ha) of B1.2 Semi-improved acid grassland, where there has been a little enrichment through agricultural treatment, supporting plants such as white clover Trifolium repens, Yorkshire-fog Holcus lanatus and common mouse-ear Cerastium fontanum as well as the typical community species given above. The assemblage of plants is referable to NVC U4b.
- In some places the vegetation grades back some way towards the typical sub-community, and in others there 8.5.6 is some heather Calluna vulgaris and blaeberry Vaccinium myrtillus, where localised patches are transitional to heath vegetation. A further section, beside the Wamphray Water, is slightly mineral-influenced and has been mapped as transitional between U4 grassland and MG5 grassland.
- **Unimproved neutral grassland, B2.1** only accounts for approximately 0.37ha of the additional area. Some 8.5.7 influence of agriculture practice is evident in the two small patches of the habitat. There is a larger amount (c2ha) of **B2.2 semi-improved neutral grassland**, most of it is on the west side of the River Annan. Both habitats are of fairly low conservation value, either relatively species-poor or rather rank or disturbed. There are elements of NVC MG5 grassland, MG6 grassland and MG10 rush-pasture, the latter usually dominated by dense rushes. The communities are all intermediates between those.

Dry and Wet Dwarf Shrub Heaths

- 8.5.8 Only **D2 Wet heath** represents this category, which accounts for a large proportion of ground in the wind farm site as a whole. Within the additional ground most recently surveyed, there is only a very small parcel of wet heath, measuring around 0.03ha. The vegetation has been assessed as transitional between the soligenous NVC M15a sub-community and NVC M6 mire.
- 8.5.9 Heather, cross-leaved heath *Erica tetralix* and purple moor-grass *Molinia caerulea* are present (M15 community constants) with frequent bog asphodel Narthecium ossifragum, devil's-bit scabious Succisa pratensis, Carex spp and Sphagnum moss species.

Mires and other wetland habitats

- The extensive blanket mire habitats that characterise much of the open ground in the proposed wind farm site 8.5.10 as a whole are absent from the additional surveyed areas.
- Only the **B5 Marshy grassland** habitat type has been mapped during the 2021 survey, locally containing a small 8.5.11 proportion (too small to be mapped) of E2.1 Acid/neutral flush, or E2.2 Basic flush.
- 8.5.12 The vegetation assemblages are very variable. Particularly valuable species-rich mire occurs in a broad strip along the lower slopes near Laverhay, above the Wamphray Water, where the vegetation has been mapped as intermediate between NVC 23a and NVC M6, but contains further elements of the M25c and M10 mire communities. Much of the vegetation is dominated by sharp-flowered rush Juncus acutiflorus with frequent purple moor-grass, and there is considerable botanical interest, with locally uncommon species such as marsh arrow-grass Triglochin palustris, marsh valerian Valeriana dioica and long-stalked yellow-sedge Carex *lepidocarpa*, usually associated with base-rich flushing.
- 8.5.13 A desktop search for notable plants in the BSBI database found a list of other basiphilous plants, including dioicous sedge Carex dioica, quaking-grass Briza media, grass-of-Parnassus Parnassia palustris, butterwort Pinguicula vulgaris, dark-leaved willow Salix myrsinifolia, broad-leaved cottongrass Eriophorum latifolium and fragrant-orchid *Gymnadenia borealis* in the vicinity, though most of the records belong in the grid square immediately to the south of the ground surveyed.
- 8514 NVC M6 mire represents the more acidic vegetation, usually here the M6d sub-community, with sharpflowered rush and much Sphagnum moss, including S. palustre, S. denticulatum and S. subnitens.
- 8.5.15 Elsewhere in the site, the marshy grassland habitat is quite extensive in the area to the west of the River Annan. There, the habitat is mainly rather species-poor, dominated by soft rush Juncus effusus, with few associates such as creeping buttercup Ranunculus repens, sorrel Rumex acetosa and Yorkshire-fog.
- The additional area contains a small stretch of the Wamphray Water, representative of the Phase 1 habitat G2 8.5.16 **Running water.** Riparian habitats are mapped according to the habitats already described above or the woodland categories below.

Woodland, Scrub and Bracken

- Additional areas of A1.2.2 Coniferous plantation, dominated by spruce *Picea* sp, had been mapped during the 8.5.17 2021 update survey. The new areas measure approximately 8ha within the forest and an additional area just under 0.5ha close to the Wamphray Water at the southern tip of the large Laverhay Forest.
- A1.1.1 Semi-natural broadleaved woodland occurs along the riparian edges of the River Annan and the 8518 Wamphray Water. Along the River Annan the woodlands are represented by the NVC communities, W9 ashelm woodland, W7 alder woodland and W11, all present as individual stands or in intermediates.
- **A1.1.1 Semi-natural broadleaved woodland** occupies just over 0.71ha of the newly surveyed area. 8.5.19
- 8.5.20 There are two small additional areas of A1.1.2 Broadleaved plantation woodland. One of these is on the west side of the River Annan, a small beech Fagus sylvatica plantation. The other lies at the southern tip of the Laverhay Forest, dominated by sycamore Acer pseudoplatanus.

- 8.5.21 Small patches of dense scrub (A2.1 Scrub) are scattered throughout the latest survey area, occupying ridges, or depressions, along the edges of the watercourses, or having established on unexploited ground within the large conifer plantation.
- 8.5.22 The scrub is quite varied in composition, with some acidic birch and willow woodland (NVC W11), some willow scrub woodland referable to wet W7 alder woodland, some ash and willow woodland (NVC W9), gorse scrub (NVC W23), hawthorn scrub (W21) and W24 bramble and raspberry underscrub. Some of the stands are mapped as intermediates of the above communities.
- 8.5.23 The scrub habitat accounts for just under 0.8ha of the ground surveyed.
- Only a very small 0.06ha of **C1.1 Continuous bracken** lies within the extra survey area, made up of little patches 8.5.24 on knowes or ridges along the eastern side of the Wamphray Water. The bracken Pteridium aquilinum vegetation belongs to NVC U20, the bracken community found on acidic substrates, with a field layer similar to U4 grassland.

Miscellaneous habitats

8.5.25 J1.3 Ephemeral/short perennial habitat occurs at two locations, one within pasture areas on either side of the River Annan. The areas are extremely small, measuring just under 0.1ha. Ephemeral and short perennial species have established on, variously, bare stony ground or around an area where there has been recent dumping of soil and rubble.

Notable plant species.

- A large proportion of the new ground surveyed consists of improved grassland and various kinds of semi-8.5.26 improved neutral or acidic grasslands (B1.2, B2.2 and B6) where diversity is low. Similarly, much of the marshy grassland recorded is heavily dominated by rushes with only few associates.
- The main focus for biodiversity is in the Wamphray Water valley. The extensive mire on the lower slopes is 8.5.27 species-rich, where a number of species of interest occur, including marsh arrow-grass, marsh valerian, fen bedstraw and long-stalked yellow-sedge.
- 8.5.28 The bryophytes in the mire are also of note, with Sphagnum subnitens, Palustriella commutata, Breutelia chrysocoma and Campylium stellatum.
- 8.5.29 The grasslands on the eastern slopes above the Wamphray Water contain several relic patches of acidic grassland (though much appears homogenous) and there are some areas of pasture with increased diversity, with species such as orchid Dactylorhiza spp. and burnet-saxifrage Pimpinella saxifraga.
- It may be that surveys conducted at a more optimal time might reveal more such species of interest, including 8.5.30 those recorded in the BSBI database, as described above.
- 8.5.31 In the scrubby woodland along the edges of the Wamphray is found the locally uncommon smooth-stalked sedge Carex laevigata.

8.6 Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

- The GWDTE discussion follows the same procedure as outlined in the preceding section concerning the 8.6.1 iteration of the wind farm design. NVC communities identified over the course of the update survey are assessed against criteria provided in SEPA guidance.
- The mapped area of the update survey is based on the habitats and constituent NVC communities identified 8.6.2 within a buffer of 100m given by SEPA in relation to shallow excavations around features such as access tracks.
- Those NVC communities highlighted by SEPA as potentially groundwater-dependent are then assessed against 8.6.3 the conditions on the site, using professional judgement based on observable features, including visible water flows, seepages and drainage, and taking into account underlying geology and hydrology.
- Within the additional area the following communities and intermediate communities are given by SEPA as 8.6.4 potentially groundwater-dependent: MG10 rush-pasture, M23 rush-pasture, M6 mire, M10 mire, M15 wet heath (M15a), M25 mire and W7 woodland.
- 8.6.5 Out of these, M23 rush-pasture, the mires M6 and M10, and W7 woodland are considered to be potentially highly dependent on groundwater. The other communities are thought to be potentially moderately dependent.
- 8.6.6 In the western part of the additional area (that includes the long access track from the western side of the River Annan until Dod Hill) most of the ground consists of agricultural pasture. Within that area are various examples of MG10 and M23 rush-pasture, particularly concentrated on the skeletal soils found in the former area of the Nether Murthat sand and gravel quarry. Along the riparian edge of the River Annan are woodlands that contain elements of the W7 alder woodland. The woodland communities have been mapped as W7-W9, intermediate between the alder woodland and the drier ash/elm woodland, W9. In these locations those communities are not considered to be dependent on groundwater sources. The rush-pastures are found on poorly-draining soils of the former quarry, or in wet basins. The riparian woodlands receive water from both the river and from drainage flows, natural or otherwise, towards the river.
- On the ground north of Laverhay, on the slopes above the Wamphray and along the riparian edge of the 8.6.7 watercourse, are examples of W7 woodland, M15a wet heath, M23 and M6 mire, either a single named community (M23a) or as intermediates (e.g. M15a-M6, M6-M23a).
- 8.6.8 M15 wet heath is present throughout much of the wider wind farm site, where it is not considered groundwater-dependent, but here, the community is the flushed M15a sub-community, intermediate with M6 mire.
- There is much variation in the mire communities which make up a broad extensive strip along the lower slopes. 8.6.9 There are elements of basic flush, where small patches of vegetation correspond to M10 Carex dioica-Pinquicula vulgaris mire, or some elements typical of the more circum-neutral M25c sub-community of the M25 purple moor-grass mire.
- The above mire communities (M15a, M23-M6 and small local gradations typical of M10 or M25c) are evidently 8.6.10 fed by irrigating groundwater that is, at least at some locations, alkaline. This is supported by the BGS 1:25,000 linear features map that shows a fault crossing the Wamphray Water a short distance north of the mires. It is possible that further minor faults and associated jointing are present, the former parallel with the more substantial feature that has been mapped. Any such features are likely to be associated with the noted groundwater-fed mires.

8.6.11 The examples of the W7 wet woodland, here with a scrubby canopy consisting of mainly willows *Salix* spp., might be supplied by groundwater by the above sources, but also may be supplied by the watercourse to some extent, inundation being frequent during spates.

Assessment of Impacts 8.7

Construction and Operational Impacts

Habitats

Impacts of Construction

- 8.7.1 The direct impacts of construction are discussed within the EcIA Section 8: Ecology of the original EIAR.
- It is considered that within the additional area the proposed development of the wind farm is likely to have 8.7.2 few significant negative impacts on the habitats of the site. The significant impacts are strictly localised and could possibly comprise the loss of mature oak trees at Lowries Hill on the east side of the River Annan, damage to species-rich mire, grassland and woodland on areas adjacent to the Wamphray Water, and, at the same location, potential damage to and contamination of groundwater sources.
- 8.7.3 There are negative impacts on other habitats such as loss of riparian woodland along the River Annan and the potential creation of water-borne silt as run-off from construction of infrastructure in the wet grassland areas west of the River Annan and along the riparian edge.
- A series of mitigation measures are described to minimise those impacts on habitats in Appendix 8.4 and the 8.7.4 OHMEP includes compensatory measures, thus ensuring that the negative impacts are generally of low magnitude, of low significance or negligible.
- There is a small amount of direct loss of GWDTE habitat on the slopes above the Wamphray Water. 8.7.5

Operational Impacts

No additional impacts from those described within the original EcIA are anticipated. 8.7.6

Species

Bats

8.7.7 The predicted impact on bats is discussed within the EcIA Section 8: Ecology of the original EIAR. No further bat survey was carried out for the AI. However an updated presentation of bat data is provided in Appendix 8.3 of this AI. Bats were recorded mainly foraging and commuting in low numbers within the site near the turbine locations. On one evening in early summer 2018 at the Sembletree Burn area, there was a high number of bats recorded with 622 passes on one night. In the same Gillesbie area there was a moderate count of 195 passes in one night in spring and 52 in summer. Later in the autumn, counts were low in the same areas. Location 2 of Silton Forest had a high count of 237 passes in one night in summer but with a low count in spring and autumn. There were moderate counts of bat passes at Broadfield height in spring, locations 2 and 3 of Silton Forest in summer, location 2 of South Loch Fell in summer and autumn, locations 2 and 3 of Three Mullach Hill in summer.

- Therefore, bats could potentially be directly impacted by loss of foraging/commuting habitat associated with 8.7.8 construction of the wind farm, as well as indirect impacts via disturbance during the construction period and upgrading of existing forestry tracks. There is more likely to be disturbance along plantation edges. The level of impact will be dependent on the time of year the work is done. For instance, if construction takes place during spring or summer, the negative impact has the potential to be greater. However, since bats feed at night and return to roost early morning, their activity time is likely to be outside construction hours. Negative impacts of construction are considered to be of low magnitude, short term and of minor significance.
- The great majority of records of bats using the site were for Common and Soprano Pipistrelle, which are both 8.7.9 common and widespread species in the UK. Those two species and the additional 50kHz pipistrelles accounted for around 98% of all transect passes. The Brown Long-eared bat is also one of the most common and widespread species but was recorded very rarely during survey, only by the remote detectors. Noctule or Myotis bats, that are both less common and less widespread than the above, were also recorded, in much smaller numbers (both a little over 1% of all transect passes).
- In general, low numbers of bats were recorded crossing the moorland areas where some of the turbines are 8.7.10 to be located. Common and Soprano Pipistrelle bats are considered to be at medium risk from collision with wind turbines, since they spend a proportion of the time flying at higher heights. Myotis bats and Brown Longeared bat are considered to be at low risk as these species have been determined to forage at low heights for almost all the time. Noctule bats are considered to be at high risk from collision with wind turbines since they spend much of their time flying at height.
- In view of the small numbers and the great majority of records from the higher open areas being of pipistrelle 8.7.11 species, collision risk is considered to be low in this area. The majority of the bats recorded were on the forest edges. There is therefore a greater collision risk at the turbines situated adjacent to the forest. The impact on bats from the operational wind farm is considered to be of medium magnitude, long term and moderate significance.

8.8 Mitigation

- Seventeen of the moorland turbines have been removed from the scheme (design mitigation) with two new 8.8.1 ones added which are located in the forestry. The reduction in the length of new access tracks required is also positive design mitigation. Combined together, these changes to the proposed scheme reduces potential environmental impacts associated with the construction and operational works of the proposal on the ecology (flora and fauna) of the Development site.
- The access track to the far west can be carefully micro-sited in conjunction with the ECoW to avoid the mature 8.8.2 trees south of Lowries Hill.
- 8.8.3 Some measures have been employed in the choice of the route of the access track to avoid greater impact to the species-rich mire. The southern branch of the access track skirts the southern limit of the mire where there is adjacent drier grassland. The northern branch uses an existing agricultural track, thus avoiding any direct impact for a short distance.
- Additional improvement is possible by moving the southern branch further south so that it runs across the 8.8.4 drier grassland. It is recommended to microsite the proposed northern branch in favour of a branch that would cross the Glengap Burn from a different location on the eastern slopes of Broadfield Height. There, it would cross over less valuable habitat, either bracken or acid grassland, and through woodland (also is not classed as GWDTE).

- 8.8.5 Micrositing of the northern branch would reduce the loss of the GWDTE to just over 0.02ha, without moving the southern branch onto the dry grassland.
- 8.8.6 The suggested movement of the southern branch onto the drier grassland results in no direct loss of the GWDTE. However, the southern access route would still remain within the 100m SEPA buffer. Measures to avoid the buffer might require abandoning any idea of routing the access track in the general vicinity. It seems from the aerial photographs that there is further mire to the south of the dry grassland area. It is distinctly possible that this mire would be similar to the species-rich mire in question, given its location on the lower slope contours. So, it may not be possible to move the track 150m away from the tip of the mire in question, without having more southerly mires come within the new buffer.
- 8.8.7 Measures to compensate for the loss of, or damage to, the species-rich mire might be difficult to achieve, given the uncertainty surrounding finding a similar combination of the complex environmental factors involved (circum-neutral and acid mineral soil, a shallow peat layer, and various types of irrigating water). Habitat management suggestions could likely only undertake general measures to create, or restore, mire habitat. Compensation for loss of riparian woodland and good quality grassland would be much easier to achieve as those habitats are not dependent on the total of the above factors, particularly with regard to groundwater irrigation.
- 8.8.8 Therefore, it is recommended that this section of the access track to site is assessed in further detail with the ECoW and the Principal Contractor at the detailed design stage if planning consent is granted. This would ensure the best design option with least disruption is utilised, prior to any construction work commencing.

8.9 Statement of Significance Summary

- 8.9.1 Additional fieldwork was required due to the alteration of the position of some of the access tracks and the addition of two new turbines. Fieldwork included a Phase 1 habitat survey and NVC survey.
- 8.9.2 Field assessment for protected species was not undertaken for the additional area, however updated surveys will be carried out pre-construction.
- 8.9.3 Appendix 8.4 of this AI provides an updated table detailing the residual effects on the ecology features of the Scoop Hill Community Wind Farm site, following the implementation of appropriate mitigation measures for the revised scheme of 60 turbines.
- 8.9.4 Due to the removal of 17 turbines from the moorland, and the reduction in associated infrastructure and access tracks, the ecological impacts of the proposed development have been reduced compared to those identified within the original EIAR.
- 8.9.5 Following additional surveys, as part of this AI submission, it has been identified that the proposed development is likely to have a few significant negative impacts on the habitats and species of the site. These significant impacts are strictly localised and comprise of the potential loss of mature oak trees at Lowries Hill on the east side of the River Annan, damage to species-rich mire, grassland and woodland on areas adjacent to the Wamphray Water, and, at the same location, potential damage to and contamination of groundwater sources. However, as noted in Section 12 of the EIAR and the AI, there are currently three access route options proposed to reach the site. The applicant does not expect to use all three of these routes and the final route will be decided post consent. This means that the western access route may not actually be chosen and if this is the case, impacts on the mature oak trees and Lowries Hill would be avoided.

Appendix 8.1 — Phase 1 Target Notes Habitats of significance highlighted in green

Target notes from additional surveys (October 2021)

Note: Phase 1 target notes from the original surveys is available in Section 8 of the original EIAR.

| Number | Grid reference | Description |
|--------|----------------|--|
| 1 | NT 11307 00544 | Well improved field but area here shows as herringbone drainage on aerial images, but apart from heavy poaching (and much buttercup) little difference in the vegetation (better as 'I' rather than 'SI') |
| 2 | NY 10718 98956 | Fresh dumping from here and going north (in line parallel with a drain) but south appears to be old rubble and soil dumping (stones – with nettle and thistle). |
| 3 | NY 10698 98934 | Small flush but presumably much past disturbed with central channel (<i>Glyceria</i> fluitans, Agrostis stolonifera, Stellaria alsine); wider margins with Juncus effusus, Holcus lanatus, Agrostis stolonifera and Ranunculus repens, plus Cardamine pratensis, Cirsium palustre, Stellaria alsine, Carex flacca, Viola palustris (rare) and the moss Calliergoniella cuspidata. |
| 4 | NY 10662 98888 | Steep woodland bank with mature oak (some ash, birch, hawthorn and hazel) over much bramble with some ferns; associate diversity limited (more so below) but includes Oxalis acetosella, Stellaria holostea, Viola riviniana, Silene dioica, Geum urbanum, Luzula sylvatica, Deschampsia cespitosa and Lysimachia nemorum. |
| 5 | NY 10661 98847 | Narrower fringe (some past dumping from field) with locally much bramble and raspberry 'scrub', with scattered alder, hazel, and sycamore. Alder and <i>Phalaris arundinacea</i> to water's edge. |
| 6 | NY 10677 98793 | Narrow woodland fringe of sycamore, oak and alder with some beech and ash over bramble and ferns (locally grassy). |
| 7 | NY 10704 98451 | Short steep ridge supporting mature oaks over a grassy ground cover (rare bluebell spike noted – both sides of fence). Less improved (but enriched) marginal grassland. |
| 8 | NY 10670 98391 | Narrow woodland edge with mostly immature alder, ash and sycamore over raspberry and grasses plus <i>Rumex acetosa, Stellaria graminea</i> and <i>Cruciata laevipes</i> (signs of frequent inundation). |
| 9 | NY 10263 98430 | Track crosses burn (narrow fringe of <i>Phalaris arundinacea</i>), and fed by railway side drain (with <i>Juncus effusus, Agrostis stolonifera</i> and <i>Ranunculus repens</i> , plus <i>Veronica beccabunga, Myosotis scorpioides</i> and <i>Senecio aquaticus</i>). |
| 10 | NY 10258 98411 | Steep embankment to railway with short semi-improved turf but free draining and quite stony – possibly artificial - with <i>Ranunculus spp., Hypochoeris radicata, Scorzoneroides autumnalis, Senecio jacobaea</i> and much <i>Rhytidiadelphus squarrosus</i> moss. |

| 11 | NY 10324 98404 | Poached wet pasture with find acetosa and Cardamine prate |
|----|----------------|--|
| 12 | NY 10392 98372 | Slightly lower-lying and levell stony drains) but appearing stolonifera, Cardamine prate flammula. |
| 13 | NY 10577 98358 | Old dyke drain with Juncus eg cespitosa and Angelica sylves |
| 14 | NY 10598 98354 | Ridge with short less improv capillaris, Festuca rubra, Dac Stellaria graminea, Centaure of mature oak on crest. |
| 15 | NY 10619 98387 | Embankment with band of sc |
| 16 | NY 10635 98388 | Riverbank with narrow fringe sylvatica, Mercurialis perenne |
| 17 | NY 10625 98394 | Damp pasture with frequent |
| 18 | NY 10630 98447 | Small marshy hollow with wil ulmaria; some Scrophularia u |
| 19 | NY 10607 98449 | Embankment with less enr Agrostis capillaris, Festuca Centaurea nigra, Plantago la |
| 20 | NY 10592 98446 | Small block of very dense scr |
| 21 | NY 10578 98424 | Firmer ground to corner but (Cynosurus cristatus, Carex la cuspidata). |
| 22 | NY 10560 98401 | Juncus effusus-dominated old draining pasture low mound. |
| 23 | NY 10521 98418 | Burn channel with marginal a (with Juncus effusus, Descher Cirsium arvense, Iris pseudac near wall and some Fontinali |
| 24 | NY 10435 98415 | Stony (past disturbed) area Hypochoeris radicata, Prunel |

requent Juncus effusus plus Ranunculus repens, Rumex ensis.

ler broad strip of poached marshy grassland (with several s similar to rest of field; wetter in places with Agrostis ensis, Cirsium palustre, Silene flos-cuculi and Ranunculus

ffusus, Phalaris arundinacea, Urtica dioica, Deschampsia stris; parallel to burn (much Phalaris arundinacea).

ved grassland (more neutral than acidic) with Agrostis ctylis glomerata, Rumex acetosa, Veronica chamaedrys, ea nigra, Plantago lanceolata and Ranunculus acris. Row

crubby bramble and broom (bluebell frequent).

e of ash, sycamore and alder; narrow bank with *Luzula is, Geum urbanum*, and bramble.

thistle, plus Stellaria graminea and Cruciata laevipes.

llow, Juncus effusus plus Cirsium arvense and Filipendula umbrosa present.

iched (but more neutral appearing) open grassland: rubra, Cynosurus cristatus, Veronica chamaedrys, nceolata and the moss Rhytidiadelphus squarrosus.

ubby willow regeneration (beech trees to the south).

still with much Juncus but also wet grassland elements eporina, Juncus articulatus and the moss Calliergoniella

d dyke channel continues parallel burn and ridge of freer

Phalaris arundinacea and some marshy grassland zones ampsia cespitosa, Ranunculus repens, Rumex acetosa, corus and Filipendula ulmaria; some alder regeneration is moss in burn.

marked by being freely drained with *Festuca rubra, la vulgaris, Lotus corniculatus* and varied mosses.

| 25 | NY 10384 98417 | Narrow but obscure wet drain-like channel (frequent <i>Silene flos-cuculi</i>); the adjacent wet pasture to the west has reduced <i>Juncus effusus</i> compared to the rest of the field. | | | | palustre, Angelica sylvestris, mosses Hylocomium splende |
|----|----------------|--|----|----------|-------|--|
| 26 | NY 14041 99041 | Sloping hillside flush with (below) a broader strip of drain-fed (more enriched) wet grassland with <i>Cynosurus cristatus, Ranunculus spp., Bellis perennis, Cirsium palustre</i> and occasional parts with <i>Carex flacca</i> and <i>Linum catharticum; Juncus effusus</i> dense to porthern edge, and frequent hawthorn to south | 36 | NY 13996 | 99447 | Strip of better draining and to classify with Cynosurus cr fuchsii but also some Callund |
| 27 | NY 14009 99080 | Acid grassland on slope appearing to be somewhat enriched in places with Agrostis capillaris, Festuca rubra, Anthoxanthum odoratum, Galium saxatile, Potentilla erecta, Trifolium repens and mosses include Hylocomium splendens; local areas with relic grazed heathy areas (Calluna vulgaris, Vaccinium myrtillus and some Carex binervis). | 37 | NY 14001 | 99510 | Slope with sycamore planta with burn woodland below sylvatica, Oxalis acetosella, Ranunculus repens, Ajuga re laevigata. |
| 28 | NY 13926 99097 | Slope with short grazed but appearing less acidic but damp and quite species rich with | 38 | NY 14006 | 99324 | Local hawthorn and bracken |
| | | Prunella vulgaris, Scorzoneroides autumnalis, Veronica chamaedrys, Conopodium majus, Potentilla sterilis and Pimpinella saxifraga and mosses include Rhytidiadelphus squarrosus and Hylocomium splendens. Some scattered hawthorn and bracken. | 39 | NY 13984 | 99159 | Slope with mostly grass dom or even heathy, with graz Danthonia decumbens and bracken and hawthorn (main |
| 29 | NY 13919 99174 | Scrub woodland on short steep banks to burn with hawthorn, hazel and willow, and some bracken (mostly grassy below). | | | | |
| 30 | NY 13932 99202 | Southern end of extensive hill slope wetland generally dominated by Juncus acutiflorus but appearing to be very diverse with some enrichment above, but more diverse and flushed below to burn (see other target notes): associates include Angelica sylvestris, Cirsium palustre, occasional Molinia caerulea, Carex spp., Hypericum tetrapterum, Galium uliginosum, Viola palustris and Valeriana dioica, and mosses include Calliergonella cuspidata, Scleropodium purum and Thuidium tamariscinum. | | | | |
| 31 | NY 13923 99266 | Slope down to burn with increased flushing and diversity (narrows between two grassy ridges): Erica tetralix, Narthecium ossifragum, Triglochin palustre, Carex echinata, C. flacca and C. lepidocarpa, and diverse mosses include Sphagnum denticulatum, S. subnitens, Warnstorfia sp., Campylium stellatum, Cratoneuron filicinum and Palustriella commutata. | | | | |
| 32 | NY 13922 99282 | Scrub woodland with hazel, hawthorn and willow (some eared willow or hybrid) with rose, <i>Calluna vulgaris, Teucrium scorodonia</i> and ferns (some <i>Polypodium vulgare</i>). | | | | |
| 33 | NY 13938 99297 | Acidic flushing with some intermediate wet heath – mire areas: Calluna vulgaris, Erica tetralix, Molinia caerulea, Succisa pratensis, Narthecium ossifragum, Carex spp., and mosses include Sphagnum denticulatum, S. subnitens and Breutelia chrysocoma. | | | | |
| 34 | NY 13950 99310 | Flush lines from Juncus acutiflorus mire (locally Juncus – Sphagnum type) with Molinia caerulea, Narthecium ossifragum, Carex spp. (some C. lepidocarpa), Dactylorhiza sp., and mosses include Sphagnum spp., Philonotis fontana and Bryum pseudotriquetrum. | | | | |
| 35 | NY 13946 99367 | Extensive Juncus mire (frequent <i>Molinia caerulea</i>), less acidic above and frequent <i>Narthecium ossifragum</i> and Sphagnum below; associates include Carex spp., Cirsium | | | | |

. Achillea ptarmica, Succisa pratensis, Valeriana dioica and ens, Scleropodium purum and Thuidium tamariscinum.

more enriched grassland by fence near old ruin; difficult ristatus, Centaurea nigra, Trifolium pratense, Dactylorhiza a vulgaris and Danthonia decumbens.

ation with extensive marginal scrub woodland, merging w; latter with much willow (some alder) over Luzula Viola riviniana, Primula vulgaris, Deschampsia cespitosa, eptans, Lysimachia nemorum, Molinia caerulea and Carex

n, and small rocks and stones, below track route.

ninated, semi-improved acid but with areas less improved, zed *Calluna vulgaris, Galium saxatile, Carex binervis,* d the moss *Hylocomium splendens*. Locally scattered inly to north of here).

Appendix 8.2– Loss of Habitat Types (new figures October 2022)

| Habitat Type | Extent of Habitat Present (ha) | Loss of Habitat (ha) | Percentage Loss (%) |
|---|--------------------------------------|----------------------|---------------------|
| A1.1.1 Semi-natural broad-leaved woodland | 37.6568 | 0.0614 | 0.16 |
| A1.1.2 Broadleaved plantation woodland | 71.1473 | 0.0341 | 0.05 |
| A1.2.2 Coniferous plantation* | 2339.1737 | 33.6689 | 1.44 |
| A1.3.2 Mixed plantation | 11.3204 | 0 | N/A |
| A2.1 Scrub | 16.4988 | 0.1043 | 0.63 |
| A4.2 Recently-felled coniferous woodland | 593.0984 | 5.0813 | 0.86 |
| B1.1 Unimproved acid grassland | 709.6712 | 5.732 | 0.81 |
| B1.2 Semi-improved acid grassland | 177.2052 | 1.4122 | 0.8 |
| B2.1 Unimproved neutral grassland | 13.2006 | 0.0801 | 0.61 |
| B2.2 Semi-improved neutral grassland | 20.0752 | 0.3825 | 1.9 |
| B4 Improved grassland | 83.6729 | 2.4786 | 2.96 |
| B5 Marsh/marshy grassland | 314.5845 | 4.6629 | 1.48 |
| B6 Poor semi-improved grassland | 89.3293 | 4.5878 | 5.14 |
| C1 Bracken | 124.7892 | 0.8915 | 0.71 |
| C3.1 Ruderal tall herb and fern | 0.4813 | 0 | N/A |
| C3.2 Non-ruderal tall herb and fern | 0.0381 | 0 | N/A |
| D1.1 Dry dwarf shrub heath | 302.614 | 0.9712 | 0.32 |
| D2 Wet dwarf shrub heath | 146.6396 | 2.4846 | 1.69 |
| D5 Dry heath/acid grassland mosaic | 50.3381 | 1.8899 | 3.75 |
| D6 Wet heath/acid grassland mosaic | 30.4126 | 0.204 | 0.67 |
| E1.6.1 Blanket bog | 74.6358 | 2.7187 | 3.64 |
| E1.7 Wet modified bog | 29.3683 | 0.4295 | 1.46 |
| E1.8 Dry modified bog | 294.2012 | 13.8508 | 4.7 |
| E2.1 Acid/neutral flush | 0.452 | 0 | N/A |
| E2.2 Basic flush | <0.1 | 0 | N/A |
| E2.3 Bryophyte-dominated spring | <0.1 | 0 | N/A |
| F1 Swamp | 0.2249 | 0 | N/A |
| G1 Standing water | 0.6563 | 0 | N/A |
| G2 Running water | N/A | 0 | N/A |
| I1.1.1 Inland cliff | 0.0572 | 0 | N/A |
| I1.2.1 Scree | 2.2352 | 0 | N/A |
| J1.2 Amenity grassland | 0.0453 | 0 | N/A |
| J1.3 Ephemeral/short perennial | 0.6274 | 0 | N/A |
| J4 Bare ground | 1.6173 | 0 | N/A |
| | 5536.0681 | 81.7263 Total loss | 1.48 |

* Habitat Type A1.2.2 coniferous plantation is commercial forestry and the applicant will be undertaking compensatory planting as outlined in Section 13: Forestry of the AI.

Appendix 8.3 – Bat Activity Data (presented as per 2019 guidance)

| Survey period | Nights of | Detector ID | Total passes over 5 | Maximum Bat activity | Maximum bat activity | Average bat activity | Bat activity level | |
|----------------------|------------|----------------------|---------------------|----------------------|-----------------------------|----------------------|-----------------------|--|
| | weather | | days | (passes per night) | level (low, moderate, high) | per night | (Low, Moderate, High) | |
| | conditions | | | | | | | |
| Spring/ Early Summer | | | | | | | | |
| 30/05/18 to | 5 | 1. Dundoran | 51 | 17 | Low | 10.2 | Low | |
| 04/06/18 | | 2. Burnt Mound | 0 | 0 | Low | 0 | Low | |
| Dundoran cluster | | 3. Broadfield Height | 309 | 89 | Moderate | 61.8 | | |
| | | 4. Craig Fell | 69 | 31 | Low | 13.8 | Low | |
| 05/06/2018 to | 7 | 1. Gudewife's Hill | 0 | 0 | Low | 0 | Low | |
| 12/06/2018 | | 2. Sembletree Burn | 4,136 | 622 | High | 590.8 | | |
| Gillesbie cluster | | 3. Gillesbie Hill | 168 | 33 | Low | 24 | Low | |
| | | 4. VP1 | 1,134 | 195 | Moderate | 16.2 | Low | |
| 21/05/18 to | 8 | 1. Finniegill | 2 | 2 | Low | 0.125 | Low | |
| 29/05/18 | | 2. Rue Gill | 0 | 0 | Low | 0 | Low | |
| Ramshaw Rig | | 3. Dryfe valley | 0 | 0 | Low | 0 | Low | |
| cluster | | 4. R'Shaw Rig | 0 | 0 | Low | 0 | Low | |
| 14/05/18 to | 4 | 1. LBKnowe | 0 | 0 | Low | 0 | Low | |
| 18/05/18 | | 2. Shed | 0 | 0 | Low | 0 | Low | |
| Silton Forest | | 3. Bog relic | 2 | 2 | Low | 0.5 | Low | |
| cluster | | 4. Old VP6 | 0 | 0 | Low | 0 | Low | |
| 27/06/2019 to | 9 | 1. Dun Moss | 4 | 3 | Low | 0.44 | Low | |
| 06/07/2019 | | 2. South Loch Fell | 106 | 21 | Low | 11.77 | Low | |
| South Loch Fell | | | | | | | | |
| cluster | | | | | | | | |
| 16/04/2019 to | 7 | 1. North T M Hill | 0 | 0 | Low | 0 | Low | |
| 26/04/2019 | | 2. Track edge | 0 | 0 | Low | 0 | Low | |
| Three Mullach | | 3. South T M Hill | 0 | 0 | Low | 0 | Low | |
| Hill cluster | | 4. Track edge west | 0 | 0 | Low | 0 | Low | |
| Mid to late sum | mer | 1 | 1 | | | | | |
| 25/07/18 to | 6 | 1. Gudewife's Hill | 125 | 45 | Low | 20.8 | Low | |
| 01/08/18 | | 2. Sembletree Burn | 40 | 18 | Low | 6.66 | Low | |
| Gillesbie | | 3. Gillesbie Hill | 0 | 0 | Low | 0 | Low | |
| | | 4. VP1 | 156 | 52 | Moderate | 26 | Low | |
| 16/07/18 to | 8 | 1. Finniegill | 1 | 1 | Low | 0.125 | Low | |
| 24/07/18 | | 2. Rue Gill | 219 | 41 | Low | 27.34 | Low | |
| Ramshaw Rig | | 3. Dryfe valley | 1 | 1 | Low | 0.125 | Low | |
| | | 4. R'Shaw Rig | 7 | 5 | Low | 0.875 | Low | |
| 13/06/2018 to | 6 | 1. LBKnowe | 76 | 28 | Low | 12.66 | Low | |
| 18/06/2018 | | 2. Shed | 16 | 8 | Low | 2.66 | Low | |
| Silton Forest | | 3. Bog relic | 18 | 9 | Low | 3 | Low | |
| | | 4. Old VP6 | 5 | 3 | Low | 0.83 | Low | |
| 10/07/18 to | 6 | 1. LBKnowe | 630 | 237 | High | 105 | Moderate | |
| 16/07/18 | | 2. Shed | 160 | 51 | Moderate | 26.66 | Low | |
| Silton Forest | | 3. Bog relic | 174 | 62 | Moderate | 29 | Low | |
| | | 4.Old VP6 | 0 | 0 | Low | 0 | Low | |

| 27/06/2019 to | 8 | 1. Dun Moss | 4 | 2 | Low | 0.5 | Low |
|-------------------|----|--------------------|-----|----|----------|-------|----------|
| 06/07/2019 | | 2. South Loch Fell | 106 | 48 | Moderate | 13.25 | Low |
| South Loch Fell | | | | | | | |
| 21/08/2019 to | 10 | 1.North T M Hill | 62 | 17 | Low | 6.2 | Low |
| 31/08/2019 | | 2. Track edge | 782 | 98 | Moderate | 78.2 | Moderate |
| Three Mullach | | 3. South T M Hill | 246 | 41 | Moderate | 24.6 | Low |
| Hill | | 4. Track edge west | 0 | 0 | Low | 0 | Low |
| Autumn | | | | | | | |
| 02/09/2018 to | 5 | 1. Gudewife's Hill | 0 | 0 | Low | 0 | Low |
| 07/09/2018 | | 2. Sembletree Burn | 0 | 0 | Low | 0 | Low |
| Gillesbie cluster | | 3. Gillesbie Hill | 0 | 0 | Low | 0 | Low |
| | | 4. VP1 | 0 | 0 | Low | 0 | Low |
| 03/10/18 to | 8 | 1. Finniegill | 0 | 0 | Low | 0 | Low |
| 15/10/18 | | 2. Rue Gill | 0 | 0 | Low | 0 | Low |
| Ramshaw Rig | | 3. Dryfe valley | 14 | 10 | Low | 1.75 | Low |
| cluster | | 4. R'Shaw Rig | 3 | 3 | Low | 0.375 | Low |
| 27/08/18 to | 8 | 1. LBKnowe | 50 | 22 | Low | 6.25 | Low |
| 07/09/2018 | | 2. Shed | 45 | 21 | Low | 5.63 | Low |
| Silton Forest | | 3. Bog relic | 60 | 26 | Low | 7.5 | Low |
| | | 4. Old VP6 | 0 | 0 | Low | 0 | Low |
| 16/07/2019 to | 10 | 1. Dun Moss | 11 | 5 | Low | 1.1 | Low |
| 27/07/2019 | | 2. South Loch Fell | 106 | 39 | Moderate | 10.6 | Low |
| South Loch Fell | | | | | | | |
| 10/09/2019 to | | 1. North T M Hill | 0 | 0 | Low | 0 | Low |
| 20/09/2019 | | 2. Track edge | 0 | 0 | Low | 0 | Low |
| Three Mullach | | 3. South T M Hill | 0 | 0 | Low | 0 | Low |
| Hill | | 4. Track edge west | 0 | 0 | Low | 0 | Low |

Appendix 8.4 – Updated Residual Effects based on 60 turbine layout

| Feature and Type | Significance without | Proposed | Residual Significance |
|------------------|---|--|--|
| of Disturbance | Mitigation | Mitigation/Enhancement | |
| Designated Sites | Impacts on Dryfe Water SSSI | Surface water management measures and monitoring | No impacts |
| Habitats | Loss of blanket bog, wet modified bog and dry modified low magnitude , of minor significance and permanent . Loss of most habitats, low in magnitude and of minor significance No direct loss of any GWDTE During construction, many negative impacts will be negligible however some such as the drying of bog habitats and water pollution are considered to be negative, of medium magnitude , permanent and of moderate significance and reversible . Operational impacts low magnitude , long term and of minor significance and reversible. | Site turbines, access tracks and other infrastructure to be located on habitats of lowest value, wherever possible, overseen by ECoW. Floating roads where necessary to cross sensitive wetland habitats. Micro-siting of infrastructure to reduce impacts as required. Habitat retention, enhancement, and creation. | Extremely unlikely to have a long-term negative effect, therefore low magnitude and of minor significance. |
| Species | | | |
| Bats | Impact on roosts low magnitude, short term, of minor significance and reversible. The effects of construction low magnitude, short term and of minor significance. During operation, due to risk of collision, negative impacts medium magnitude, long term and moderate significance | Limit working to daylight hours only to avoid need for artificial lighting. Ensure turbine blade tips are a minimum of 50m from the edge of woodland. Provide bat boxes in suitable locations. Tree planting in areas well away from turbines Feathering of the turbine blades at low winds, for the turbines where bats are present. | Improved roosting opportunities. Impacts reduced to low magnitude and of minor significance . Potential for some positive impact through provision of bat boxes and other habitat enhancements away from turbines. |

| Otters | Negligible negative impact due to direct habitat loss. Construction impacts on protected structures low magnitude, short term and of minor significance. However, negative impacts of medium magnitude, short term and of moderate significance due to potential pollution of watercourses. Operational impacts negligible. | Pre-construction surveys. 30m buffer around holts, potential holts and lie-ups; Minimise water crossings; Implementation of strict pollution prevention measures; All staff to be briefed on otter structures; Retain scrub/woodland along watercourses; Cap culverts/pipes if stored overnight on site; and Cover excavations >0.5m deep or provide ramp, also temporary exclusion fencing. | Extremely unlikely to have a significant negative impact. Potential for positive impact through planting along watercourses. Therefore negligible magnitude and not significant |
|---------------|--|---|--|
| Badgers | Habitat loss low magnitude, long term and of minor significance Construction impacts low magnitude, short term and of minor significance. Operational impacts low magnitude, permanent and of minor significance | Preconstruction surveys; 30m buffer around setts, license if 100m from borrow pits; Cover excavations (see otter); Enhancement planting; All staff to be briefed on badger setts; Forestry operators to be briefed on sett locations. | Extremely unlikely to have a significant negative impact. Some possible positive impact through improved foraging opportunities. |
| Red Squirrel | Habitat loss negligible . Construction impacts low magnitude, short term and of minor significance. Operating impacts negligible. | Pre construction surveys for dreys; Woodland management. | Negligible impacts |
| Pine Marten | Habitat loss negligible . Construction impacts low magnitude, short term and of minor significance . Operating impacts negligible . | Pre construction surveys for dreys; Woodland management. | Negligible impacts |
| Common lizard | Loss of habitat low magnitude, long term and of low significance. | Ground clearance out with breeding season, site checks for reptiles, hibernaculums cleared late summer, new ones constructed. | Extremely unlikely to have a significant negative impact. Negligible |

| | Construction effects medium magnitude, short term and of moderate significance. Operational impacts negligible. | | magnitude and not significant. | | | |
|-----------------------|--|---|---|--|--|--|
| Migratory Fish | Construction effects of high magnitude, long term and of major significance | Implementation of strict pollution prevention measures; Ensuring there is no impedance to fish from new culverts or bridges. | Low magnitude of minor significance and temporary impacts. | | | |
| Amphibians | Effects of construction low magnitude of minor significance. The effects of the operational wind farm are considered negligible . | Ground clearance out with breeding season, ponds created for amphibians | Impact considered negligible with some positive effects. | | | |
| Butterflies and moths | The loss of habitat negligible and the effects of construction and operation are also considered to be negligible . | Habitat enhancement | Impact considered negligible with some positive effects. | | | |
| Cumulative Impacts | | | | | | |
| Habitats and species | Generally of low magnitude and low significance | Following mitigation outlined above | Mainly insignificant negative impacts, at worst low magnitude of minor significance and some positive impacts | | | |
| Decommissioning In | npacts | | | | | |
| Habitats and species | Slight negative cumulative impacts could occur at the local level | Site will be assessed at the time of decommissioning and relevant mitigation put in place | Insignificant negative impacts | | | |









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