APPENDIX 6-1

TURBINE BASE BOTANICAL STUDY

Appendix 6-1 – Botanical Assessment Report

Proposed Clonberne Wind Farm, Co. Galway

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Planning and Environmental Consultants

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1. INTRODUCTION

MKO were commissioned to undertake detailed botanical surveys to provide an evaluation and assessments of the habitats occurring on site at the proposed Clonberne Wind Farm, Co. Galway. The detailed assessments focused on the habitats occurring under or immediately adjacent to the footprint of the Proposed Project. Botanical surveys were undertaken on the 28th June 2019, 15th July 2019, 19th August 2019, 5th 1st September 2023, 23rd November 2023, 18th January 2024 and 21st June 2024 with additional information on habitat mapping undertaken on numerous other dates in 2019, 2020, 2021, 2022, 2023 and 2024.

1.1 Survey Methods

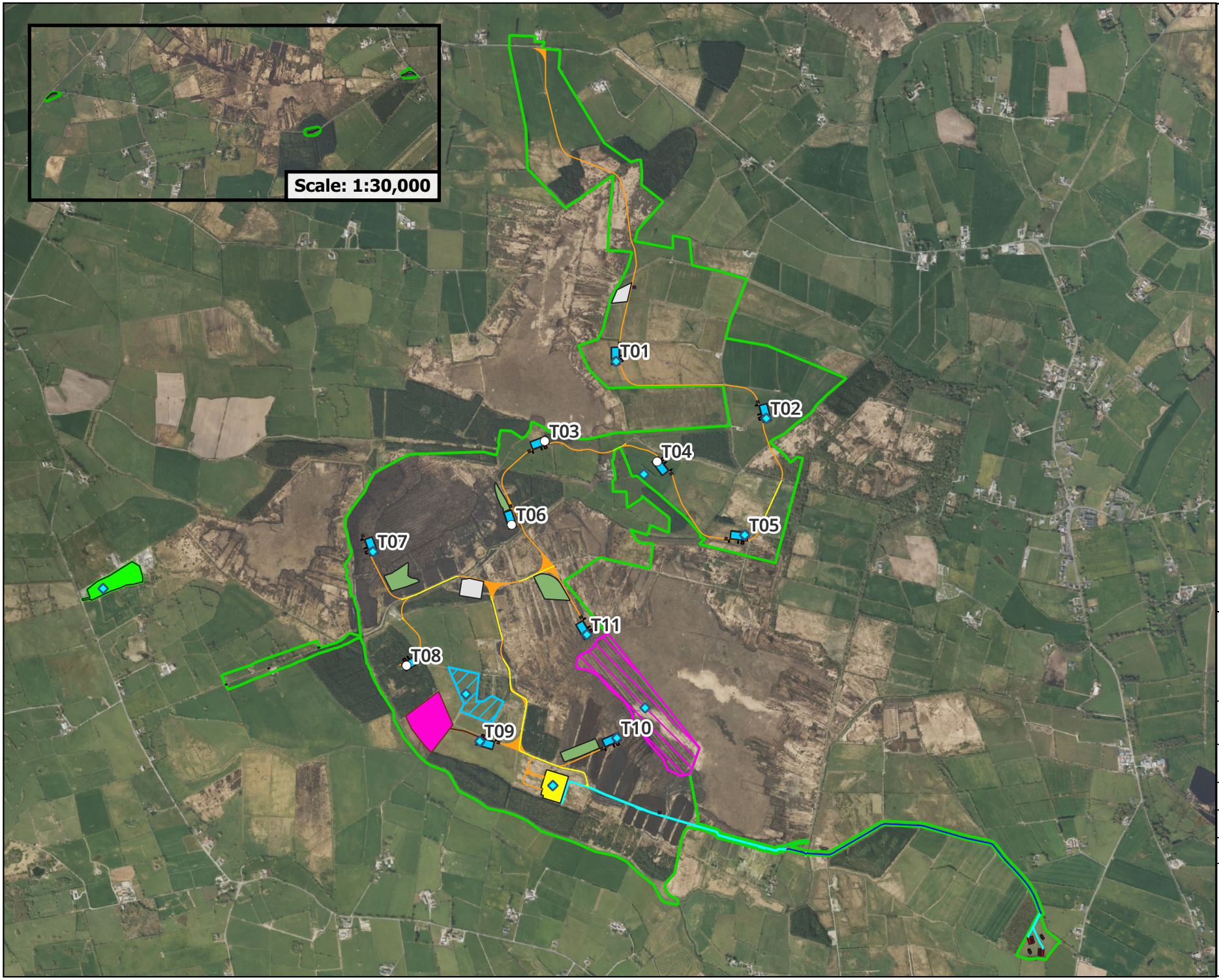
A total of 17 detailed relevés were undertaken within the construction footprint or representative habitats within the EIAR Site Boundary. The location of each is provided on Figure 1-1.

Habitats were assessed and described using both Fossitt (Fossitt, 2000) and the Irish Vegetation Classification (IVC) (Perrin *et al.*, 2018) system. Where habitats had a potential to correspond to Annex 1 habitat type further detailed assessment of Annex I habitats was also undertaken in line with the condition assessment methods outlined in Martin *et al.* (2018), while reference was also made to the EU interpretation manual (EC, 2013).

Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010), while mosses and liverworts nomenclature follow '*Mosses and Liverworts of Britain and Ireland - a field guide'* (British Bryological Society, 2010).

1.2 Statement of Authority

Field surveys were undertaken by Sarah Mullen (B.Sc., M.Sc., Ph.D., ACIEEM), Pat Roberts (B.Sc., MCIEEM), Rachel Walsh (B.Sc.), Luke Dodebier (B.Sc.), Katy Beckett (B.A., M.Sc.), Kate O'Donnell (B.Sc., ACIEEM), Ciara Lynn Sheehan (B.Sc.) and Mairead Kavanagh (B.Sc.) of MKO. Pat, Sarah and Kate have over 18, 7 and 5 years professional experience respectively in ecological management and assessment. Rachel, Luke, Katy, Ciara Lynn and Mairead are qualified ecologists with experience and assessment in ecological surveys and monitoring. This report has been prepared by Katy Beckett and reviewed by Kate O'Donnell.



Map Legend

- EIAR Site Boundary
- Botanical Relevé Locations
- Proposed Turbine Layout
- Proposed Crane Platform Hardstanding
- Proposed Turbine Foundations
- Proposed Substation
- Proposed Construction Compounds
- Proposed Borrow Pit
- Proposed Spoil Storage Area
- Proposed Peat Repository Areas
- Proposed New Roads
- Proposed Upgrades to Existing Roads
- Proposed Operational Access Road
- Proposed Spoil Repository Access Road
- Proposed Passing Bays
- Proposed TDR Accommodation Areas
- Proposed Cable in the Public Road
- Proposed Cable Route and Cable Access Track
- Proposed Grid Connection Compounds
- Proposed Grid Connection Masts
- Proposed 38kV Line to Cable Interface End Masts
- Proposed Woodland Replanting Area
- Proposed Peatland Enhancement Area

Drawing Title

Botanical Relevé Locations

Project Title

Proposed Clonberne Wind Farm, Co. Galway

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2. RESULTS

On 18th January 2024 a ground-truthing exercise was undertaken and all 11 turbines and associated infrastructure were resurveyed. All habitats were readily identifiable at the time of survey. The surveys on this date determined that no habitats had changed and that the relevés taken during the optimal survey season in previous years were still representative of the habitats currently present at each of these locations.

2.1 Turbine 1

Turbine 1 (T1) is located at the western end of a field classified as **Wet grassland (GS4)** (Plate 2-1). The turbine footprint is located in an area of tightly grazed agricultural wet grassland. This sward was dominated by meadow buttercup *(Rancunculus acris*), ribwort plantain (*Plantago lanceolata*), soft rush (*Juncus effusus),* white clover (*Trifolium repens*) and bird's foot trefoil (*Lotus corniculatus*). Other species present included purple moor grass (*Molinia caerulea*), marsh thistle (*Cirsium palustre*), Yorkshire fog (*Holcus lanatus*) and red fescue (*Festuca rubra.*). The results of the relevé undertaken at this location are presented below in Table 2-1.

The remainder of the field to the east of T1 consists of an area of wet grassland and a larger area of species-rich wet grassland further east of this, as outlined in Section 2.2. These areas are separated from the location of T1 by a small **Drainage ditch (FW4)** located to the east of T1.

Table 2-1 Relevé results at the location of proposed Turbine 1

Turbine 1	ITM Grid Reference: X 554970, Y 757580	Date: 28/06/2019, 19/08/2019, 18/01/2024
Species	Common Name	Percentage cover (%)
Vascular Plants		
Rancunculus acris	Meadow buttercup	20
Plantago lanceolata	Ribwort plantain	20
Soft rush	Juncus effusus	20
Trifolium repens	White clover	10
Lotus corniculatus	Bird's foot trefoil	10
Cirsium palustre	Marsh thistle	5
Holcus lanatus	Yorkshire fog	5
Festuca rubra	Red fescue	5
Molinia caerulea	Purple moor grass	5
Trifolium pratense	Red clover	5
Potentilla erecta	Tormentil	2
Juncus conglomeratus	Compact rush	2

Equisetum sp.	Horsetail	1
Anthoxanthum odoratum	Sweet vernal grass	1
Carex nigra	Common sedge	0.5
Taraxacum officinale	Dandelion	0.5
Luzula campestris	Field woodrush	0.5
Remex acetosa	Common sorrel	0.5
Prunella vulgaris	Selfheal	0.5
% Tree Cover		0%
%Bare Ground		1%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%
% Graminoids		34%
Mean vegetation height		10cm
Fossitt (2000) Habitat Classification		**Wet Grassland (GS4)**
Affinity to Annex I habitat		**No**

Plate 2-1 T1 is located in an area of heavily grazed wet grassland

2.2 Wet Grassland between Turbine 1 and Turbine 2

The proposed access track between T1 and Turbine 2 (T2) traverses an area of grassland containing pockets of cutover bog and then runs along the southern boundary of the field. This is an area of species rich **Wet grassland (GS4)** (Plate 2-2). The grassland was dominated by brown sedge (*Carex disticha*), soft rush, sweet vernal grass (*Anthoxanthum odoratum*) and marsh cinquefoil (*Potentilla palustris*) with smaller amounts of purple moor grass (*Molinia caerulea*), creeping bent grass (*Agrostis stolonifera*), jointed rush (*Juncus articulatus*) and meadow thistle (*Cirsium dissectum*). The grassland forms a mosaic with areas of **Cutover bog (PB4)** characterised by heath type vegetation supporting sweet vernal grass (*Anthoxanthum odoratum*), carnation sedge (*Carex panicea*), bell heather (*Erica cinerea*) and star sedge (*Carex echinata*) with occasional bog myrtle (*Myrica gale*).

The species recorded within the wet grassland are included in Table 2-2 and 2-3 below. Relevé 1 was taken in the centre of the field and Relevé 2 was taken at the southern boundary of the field through which the proposed road traverses. The grassland was found to conform to the Annex I habitat ***Molinia* meadows on calcareous, peaty or clayey-laden soils (*Molinion caeruleae*) [6410].**

Table 2-2 Relevé 1 results at the location of the species rich grassland east of Turbine 1

Between T1 and T2 Relevé 1	Grid reference: ITM X 555238, Y:757555	Date: 28/06/2019
Species	Common Name	Percentage cover (%)
Vascular Plants		
Carex disticha	Brown sedge	40
Juncus effusus	Soft rush	20
Anthoxanthum odoratum	Sweet vernal grass	10
Potentilla palustris	Marsh cinquefoil	10
Trifolium repens	White clover	8
Agrostis stolonifera	Creeping bent	7
Juncus articulatus	Jointed rush	5
Cirsium dissectum	Meadow thistle	5
Molinia caerulea	Purple moor grass	<5
Potentilla erecta	Tormentil	5
Succisa pratensis	Devil's bit scabious	0.5
Chamerion angustifolium	Rosebay willowherb	0.5
Holcus lanatus	Yorkshire fog	0.5
Carex echinata	Star sedge	0.5
Equisetum sp.	Horsetail	0.5
Mentha aquatica	Water mint	0.5
Galium palustre	Marsh bedstraw	0.5
Non-vascular Plants		
Calliergonella cuspidata	Pointed spear-moss	5
% Tree Cover		0%
%Bare Ground		0%
% Exposed rock		0%

% Bryophyte/lichen cover	5%
% Heath	0%
% Graminoids	88%
Mean vegetation height	20cm
Fossitt (2000) Habitat Classification	**Wet Grassland (GS4)**
Affinity to Annex I habitat	**Yes - 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)**

Table 2-3 Relevé 2 results at the location of the species rich grassland east of Turbine 1

Between Turbine 1 and Turbine 2 **Relevé 2**	**Grid reference: ITM X: 555362 Y:757484**	**Date: 01/09/2023**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Juncus effusus	Soft rush	40
Molinia caerulea	Purple moorgrass	15
Filipendula ulmaria	Meadowsweet	6
Poa sp.	Meadow grass	5
Festuca sp.	Fescue grass	5
Succisa pratensis	Devil's-bit scabious	4
Potentilla erecta	Tormentil	4
Equisetum sp.	Horsetail	3
Ranunculus repens	Creeping buttercup	3
Cirsium dissectum	Meadow thistle	3
Juncus articulatus	Jointed rush	2
Cynosurus cristatus	Crested dogstail	2
Rumex acetosa	Common sorrel	2
Holcus lanatus	Yorkshire fog	2
Crepis paludosa	Marsh hawk's beard	2

Mentha aquatica	Water mint	2
Anthoxanthum odoratum	Sweet vernal grass	2
Cardamine flexuosa	Wavy bittercress	1
Agrostis stolonifera	Creeping bent grass	1
Stellaria graminea	Lesser stitchwort	0.5
Lolium perenne	Perennial rye grass	0.25
Achillea millefolium	Yarrow	0.25
Calluna vulgaris	Ling heather	0.25
Myosotis scorpioides	Water forget-me-not	0.25
Carex echinata	Star sedge	0.25
Trifolium repens	White clover	0.25
Non-vascular Plants		
Calliergonella cuspidata	Pointed spear-moss	15
% Tree Cover		0%
%Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		25%
% Heath		0.25%
% Graminoids		74.5%
Mean vegetation height		20cm
Fossitt (2000) Habitat Classification		**Wet Grassland (GS4)**
Affinity to Annex I habitat		**Yes - 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)**

Plate 2-2 Wet grassland to the east of T1 corresponding to the Annex I habitat Molinia meadow

2.3 Turbine 2

T2 is located in a field of semi-improved wet **Agricultural grassland (GA1)** adjacent to a local road (Plate 2-3). Dominant species include perennial rye grass (*Lolium perenne*) and white clover (*Trifolium repens*). Less frequently occurring species include creeping buttercup (*Ranunculus repens*) and soft rush (*Juncus effusus*). The results of the turbine base botanical assessment at the location of T2 is presented in Table 2-4 below.

Table 2-4 Relevé results at the proposed location of T2

Turbine 2	Grid reference: ITM X: 555670 Y: 757317	Date: 15/07/2019, 18/01/2024
Species	Common Name	Percentage cover (%)
Vascular Plants		
Lolium perenne	Perennial Rye Grass	60
Trifolium repens	White clover	25
Ranunculus repens	Creeping buttercup	15
Juncus effusus	Soft rush	10
Bellis perennis	Daisy	4
Holcus lanatus	Yorkshire fog	3

Senecio jacobaea	Ragwort	0.5
Rumex obtusifolius	Broad-leaved dock	0.5
% Tree Cover		0%
%Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		0 %
% Heath		0%
% Graminoids		73%
Mean vegetation height		~8cm
Peat depth		N/A
Fossitt (2000) Habitat Classification		**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat		**No**

Plate 2-3 T2 is located in an area of wet semi-improved agricultural grassland (GA1)

2.4 Woodland along access track south of Turbine 2

An area of dry **Bog woodland (WN7)** is located to the south of T2 (Plate 2-4). The access track between T2 and Turbine 5 (T5) to the south traverses this area of woodland. The woodland was dry and the ground firm underfoot. No *Sphagnum* species were present. The non-native invasive species *Rhododendron ponticum* and cherry laurel (*Prunus laurocerasus*) were present throughout the woodland. The results of a relevé undertaken at this location are presented below in Table 2-5.

Table 2-5 Relevé results at the location of the proposed access road south of Turbine 2

Access track south of T2	Grid reference: ITM X 555766, Y 757098	Date: 28/06/2019, 18/01/2024
Species	Common Name	Cover abundance
Vascular Plants		
Betula pubescens	Downy birch	90
Rubus fruticosus agg.	Bramble	80
Rhododendron ponticum	Rhododendron	10
Molinia caerulea	Purple moor grass	10
Non-vascular Plants		
Hypnum jutlandicum	Heath plait-moss	20
Thuidium tamariscinum	Common tamarisk moss	10
% Tree cover		90%
% Bare ground/leaf litter		20% leaf litter
% Exposed rock		0%
% Bryophyte/lichen cover		30%
% Heath		0%
% Graminoids		10%
Mean vegetation height		<10cm
Fossitt (2000) Habitat Classification		**Bog Woodland (WN7)**
Affinity to Annex I habitat		**No**

Plate 2-4 Non-Annex I Bog woodland along the access track south of T2

2.5 Turbine 3

Turbine 3 (T3) is located in habitat classified as **Conifer Plantation (WD4)** dominated by Sitka spruce (*Picea sitchensis*) (Plate 2-5). No other natural habitats were present at the location of T3 and therefore no relevé was taken at this location. Alder (*Alnus glutinosa*) was present along the edge of the plantation.

Plate 2-5 T3 is located in an area of Sitka spruce Conifer plantation (WD4)

2.6 Turbine 4

Turbine 4 (T4) is located in a field classified as **Improved agricultural grassland (GA1)** dominated by perennial rye grass (*Loilium perenne*) (Plate 2-6). The results of the turbine base botanical assessment at the location of T4 is presented in Table 2-6 below.

Table 2-6 Relevé results at the location of the proposed Turbine 4

Turbine 4	Grid reference: ITM X: 555071, Y: 757069	Date: 15/07/2019, 18/01/2024
Species	Common Name	Percentage cover (%)
Vascular Plants		
Lolium perenne	Perennial rye grass	70
Rumex obtusifolius	Broad-leaved dock	15
Ranunculus repens	Creeping buttercup	5
Holcus lanatus	Yorkshire fog	5
Taraxacum officinale	Dandelion	4
Cardamine flexuosa	Wavy bittercress	3
Rumex acetosa	Common sorrel	2

Trifolium repens	White clover	1
% Tree Cover		0%
%Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%
% Graminoids		75%
Mean vegetation height		<10cm
Peat depth		N/A
Fossitt (2000) Habitat Classification		**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat		**No**

Plate 2-6 T4 is located in Improved agricultural grassland (GA1)

2.7 Turbine 5

T5 is located in an agricultural field classified as **Wet grassland (GS4)** (Plate 2-7). Soft rush (*Juncus effusus*) and Yorkshire fog (*Holcus lanatus*) comprised the dominant species with perennial rye grass (*Lolium perenne*) being less frequent. The results of the turbine base botanical study at the location of T5 are presented in Table 2-7 below.

Table 2-7 Relevé results at the location of the proposed Turbine 5

Turbine 5	Grid reference: ITM X: 555576, Y: 756769	Date: 28/06/2019, 18/01/2024
Species	Common Name	Percentage cover (%)
Vascular Plants		
Juncus effusus	Soft rush	40
Holcus lanatus	Yorkshire fog	30
Lolium perenne	Perennial rye grass	10
Poa trivialis	Rough meadow grass	5
Cerastium fontanum	Common mouse-ear	3
Ranunculus acris	Meadow buttercup	3
Trifolium repens	White clover	2
Rumex acetosa	Common sorrel	2
Cirsium arvense	Marsh thistle	1
Trifolium pratense	Red clover	1
Epilobium sp.	Willowherb	1
Equisetum sp.	Horsetail sp.	1
% Tree Cover		0%
%Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%
% Graminoids		85%
Mean vegetation height		10cm

Fossitt (2000) Habitat Classification	Wet grassland (GS4)
Affinity to Annex I habitat	No

Plate 2-7 T5 is located in Wet grassland (GS4)

2.8 Turbine 6

Turbine 6 (T6) is located on recently **Cutover bog (PB4)** consisting entirely of bare peat, therefore no relevé was taken in this area. The bog was completely cutover and stacked with cut peat, with very little vegetation and no other habitats present (Plate 2-8).

Plate 2-8 T6 is located in an area of cutover bog consisting of bare peat

2.9 Turbine 7

Turbine 7 (T7) is located in an area of recently **Cutover bog (PB4**) consisting almost entirely of bare peat (Plate 2-9). The only plant species present at the location of the proposed turbine was bog asphodel (*Narthecium ossifragum*). Occasional species colonising the bare peat in the surrounding area included toad rush (*Juncus bufonius*), very sparse purple moor grass (*Molinia caerulea*), bog asphodel, hare's tail cotton grass (*Eriophorum vaginatum*) and common yellow sedge (*Carex viridula* ssp. *oedocarpa*). The results of the turbine base botanical assessment at the location of T7 is presented in Table 2-8 below.

Table 2-8 Relevé results at the location of the proposed Turbine 7

Turbine 7	**Grid reference: ITM X: 553834, Y: 756689**	**Date: 15/07/2019, 18/01/2024**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Narthecium ossifragum	Bog asphodel	1
% Tree Cover		0%
%Bare Ground		99%
% Exposed rock		0%

% Bryophyte/lichen cover	0%
% Heath	0%
% Graminoids	0%
Mean vegetation height	0cm
Peat depth	>1m
Fossitt (2000) Habitat Classification	**Cutover Bog (PB4)**
Affinity to Annex I habitat	**No**

Plate 2-9 T7 is located in Cutover bog (PB4) dominated by bare peat

2.10 Turbine 8

Turbine 8 (T8) is located is an area of immature **Conifer plantation (WD4)** dominated by Sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta*). Ground flora comprised purple moor grass and ling heather. As no other natural habitats were present at this location, no relevé was undertaken at the location of T8.

2.11 Woodland along access track north of Turbine 9

An area of **Wet willow-alder-ash woodland (WN6)** is located to the north of T9 (Plate 2-10). The proposed access track traverses this area of woodland through an existing track comprising **Buildings and artificial surfaces (BL3)**. The woodland is dry and the ground firm underfoot, with heavy poaching from cattle. The woodland is dominated by alder (*Alnus glutinosa*) with sparse hawthorn (*Crataegus monogyna*), beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*) and basket willow (*Salix fragilis*). Areas of the woodland had an open canopy, allowing a number of grasses and forbs to populate the understorey. The results of a 20mx20m relevé at this location are shown below in Table 2-9.

This area was subjected to a condition assessment to assess the potential for this area to conform to the Annex I habitat 'Alluvial forests with *Alnus glutinosa* and F*raxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]'. The results of the condition assessment concluded that, despite the high quality of the wet woodland habitat within the construction footprint, it did not meet the criteria necessary to be considered an Annex 1 habitat. As a result, it is classified as wet willow-alder-ash woodland (WN6) grown on cut-over bog, dominated by alder and subjected to waterlogged conditions.

Table 2-9 Relevé results within the woodland along the proposed access road north of Turbine 9

Turbine 9	Grid reference: ITM X: 554334, Y: 755807	Date: 15/07/2019, 18/01/2024
Species	Common Name	Percentage cover (%)
Vascular Plants		
Ranunculus repens	Creeping buttercup	30
Rubus fruticosus agg.	Brambles	30
Alnus glutinosa	Alder	30
Poa trivialis	Rough meadow grass	25
Juncus effusus	Soft rush	20
Holcus lanatus	Yorkshire fog	10
Fraxinus excelsior	Ash	10
Anthoxanthum odoratum	Sweet vernal grass	10
Equisetum palustre	Marsh horsetail	5
Filipendula ulmaria	Meadowsweet	5
Dryopteris dilatata	Broad buckler fern	5
Crataegus monogyna	Hawthorn	5
Fagus sylvatica	Beech	5
Salix fragilis	Basket willow	5

Urtica dioica	Nettles	5
Glyceria fluitans	Floating sweet grass	3
Galium aparine	Cleavers	3
Rumex acetosa	Common sorrel	2
Geranium robertianum	Herb Robert	2
Rumex obtusifolius	Broad leaved dock	1
Hedera helix	Ivy	1
Cirsium palustre	Marsh thistle	1
Lysimachia nemorum	Yellow pimpernel	0.5
Jacobaea aquatica	Marsh ragwort	0.5
Non-vascular plants		
Calliergonella cuspidata	Pointed spear moss	30
Kindbergia praelonga	Common feather-moss	30
Thuidium tamariscinum	Common tamarisk moss	25
Neckera pumila	Dwarf neckera	20
Brachythecium rutabulum	Rough-stalked feather-moss	15
Isotechium myosuroides,	Slender mouse-tail moss	15
Thamnobryum alopecurum	Fox-tail feather-moss	5
Calypogeia arguta	Notched pouchwort	5
Atrichum undulatum	Common smoothcap moss	5
Mnium hornum	Swan's-neck thyme-moss	5
Aneura pinguis	Greasewort	3
% Tree Cover		0%
%Bare Ground		5%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%

% Graminoids	83%
Mean vegetation height	7cm
Fossitt (2000) Habitat Classification	**Wet willow-alder-ash woodland (WN6)**
Affinity to Annex I habitat	**No**

Plate 2-10 Wet willow-alder-ash woodland (WN6) along the proposed access track to the north of T9

2.12 Turbine 9

T9 is located in a field classified as **Improved agricultural grassland (GA1)** (Plate 2-11). Dominant species included rye grass (*Lolium perenne*) and Yorkshire fog (*Holcus lanatus*). A dry, vegetated **Drainage ditch (FW4)** delineates the field boundary immediately to the north of the proposed turbine location containing species including lesser spearwort (*Ranunculus flammula*), marsh thistle (*Cirsium palustre*) and horsetail sp. (*Equisetum* sp.). The results of the turbine base botanical assessment at the location of T9 is presented in Table 2-10 below.

Table 2-10 Relevé results at the location of the proposed Turbine 9

Turbine 9	**Grid reference: ITM X: 554334, Y: 755807**	**Date: 15/07/2019, 18/01/2024**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		

Lolium perenne	Perennial rye grass	30
Holcus lanatus	Yorkshire fog	30
Trifolium repens	White clover	10
Dactylis glomerata	Cocksfoot grass	10
Juncus articulatus	Jointed rush	7
Cynosurus cristatus	Crested dog's tail	5
Agrostis stolonifera	Creeping bent grass	2
Ranunculus repens	Creeping buttercup	2
Festuca rubra	Red fescue	2
Poa trivialis	Rough meadow grass	2
Ranunculus flammula	Lesser spearwort	1
Rumex crispus	Curled dock	1
% Tree Cover		0%
%Bare Ground		5%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%
% Graminoids		83%
Mean vegetation height		7cm
Fossitt (2000) Habitat Classification		**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat		**No**

Plate 2-11 T9 is located in a field classified as Improved agricultural grassland (GA1)

2.13 Turbine 10

Turbine 10 (T10) is located in an area of recently Cutover bog (PB4) consisting partially of bare peat (Plate 2-12). Vegetation diversity was very low with the only species present including cottongrass (*Eriophorum angustifolium*), ling heather (*Calluna vulgaris*), cross leaved heath (*Erica tetralix*) and compact rush (*Juncus conglomeratus*). The results of the relevé undertaken at the location of T10 are presented in Table 2-11 below.

Table 2-11 Relevé results at the location of the proposed Turbine 10

Turbine 10	Grid reference: ITM X: 554983, Y: 755819	Date: 23/11/2023
Species	Common Name	Percentage cover (%)
Vascular Plants		
Eriophorum angustifolium	Cottongrass	80
Calluna vulgaris	Ling heather	10
Erica tetralix	Cross leaved heath	2
Juncus conglomeratus	Compact rush	2
Non-vascular Plants		
Hypnum jutlandicum	Cypress-leaved plait moss	5

Polytrichum juniperinum	Juniper haircap moss	1
% Tree Cover		0%
%Bare Ground		8%
% Exposed rock		0%
% Bryophyte/lichen cover		6%
% Heath		12%
% Graminoids		82%
Mean vegetation height		8cm
Fossitt (2000) Habitat Classification		**Cutover bog (PB4)**
Affinity to Annex I habitat		**No**

Plate 2-12 T10 is located in an area of Cutover bog (PB4) consisting primarily of bare peat and a high cover of cottongrass

2.14 Turbine 11

Turbine 11 (T11) is located in an area of recently **Cutover bog (PB4)** consisting predominantly of bare peat (> 80%) (Plate 2-13). Vegetation cover was very sparse with the only species present including

toadrush (*Juncus bufonius*), hare's tail cottongrass (*Eriophorum vaginatum*) and ling heather (*Calluna vulgaris*). The results of the relevé undertaken at the location of T11 are presented in Table 2-12 below.

Table 2-12 Relevé results at the location of the proposed Turbine 11

Turbine 11	**Grid reference: ITM X: 554835, Y: 756304**	**Date: 28/06/2019, 18/01/2024**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Juncus bufonius	Toadrush	10
Eriophorum angustifolium	Common cottongrass	5
Calluna vulgaris	Ling heather	3
% Tree Cover		0%
%Bare Ground		80%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		3%
% Graminoids		5%
Mean vegetation height		0cm
Peat depth		>1m
Fossitt (2000) Habitat Classification		**Cutover Bog (PB4)**
Affinity to Annex I habitat		**No**

Plate 2-13 T11 is located on Cutover bog (PB4) consisting primarily of bare peat

2.15 Proposed Wind Farm Access Road

The proposed wind farm access road approaches the wind farm from the north. It traverses fields classified as **Improved agricultural grassland (GA1)**, rush dominated **Wet grassland (GS4)** with meadowsweet (*Filipendula ulmaria*), wild angelica (*Angelica sylvestris*) and Yorkshire fog (*Holcus lanatus*), pockets of dry birch-dominated **Scrub (WS1)** with gorse (*Ulex europaeus*), immature sitka spruce (*Picea sitchensis*) dominated **Conifer plantation (WD4)** and **Cutover bog (PB4).** The cutover bog was dominated by purple moor grass (*Molinia caerulea*) and common cottongrass (*Eriophorum angustifolium*) with bog myrtle (*Myrica gale*), ling heather (*Calluna vulgaris*) and cross-leaved heath (*Erica tetralix*) also present. It was predominantly dry in nature but wetter pockets supported bog asphodel (*Narthecium ossifragum*) and round-leaved sundew (*Drosera rotundifolia*). The results of a relevé taken in this area of cutover bog is presented in Table 2-13 below.

Table 2-13 Relevé results along the proposed access route

Proposed access route	**Grid reference: 53.57297, -8.67948**	**Date 24/08/2021**
Species	**Common Name**	**% Cover**
Vascular Plants		
Molinia caerulea	Purple moor grass	90
Myrica gale	Bog myrtle	25
Calluna vulgaris	Ling heather	5

Erica tetralix	Cross leaved heath	4
Potentilla erecta	Tormentil	1
Non-vascular Plants		
Hypnum jutlandicum	Heath Plait-moss	15
% Tree Cover		0%
% Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		15%
% Heath		5%
% Graminoids		90%
Mean vegetation height		Not measured
Fossitt (2000) Habitat Classification		**Cutover bog (PB4)**
Affinity to Annex I habitat		**No**

2.16 Proposed Substation

The proposed substation is located in the south of the Site. The field in which it is located is predominantly **Improved agricultural grassland (GA1)** dominated by perennial ryegrass (*Lolium perenne*) and Yorkshire fog (*Holcus lanatus*), transitioning into **Wet grassland (GS4)** in the south as the terrain gently slopes into wetter areas (Plate 2-14). Small pockets of **Scrub (WS1)** are also present within this field, to the north and west of the proposed substation location. A wet **Drainage ditch (FW4)** flows in a southerly direction through the proposed substation to join another deep drain that delineates the southern boundary of the field and the edge of the adjacent **Conifer plantation (WD4).**

Table 2-14 Relevé results at the location of the proposed substation

Proposed substation	**Grid reference: ITM X: 554697, Y 755578**	**Date: 23/11/2023**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Lolium perenne	Perennial rye grass	60
Holcus lanatus	Yorkshire fog	30
Cerastium fontanum	Common mouse ear	5
Ulex europaeus	Gorse	2

Trifolium repens	White clover	2
Plantago lanceolata	Ribwort plantain	2
Rumex acetosa	Common sorrel	1
Ranunculus repens	Creeping buttercup	1
Rumex acetosella	Sheep's sorrel	0.5
Ranunculus acris	Meadow buttercup	0.5
Cirsium dissectum	Meadow thistle	0.5
Vicia cracca	Tufted vetch	0.25
Cirsium arvense	Creeping thistle	0.25
Sonchus arvensis	Perennial sowthistle	0.25
% Tree Cover		0%
% Bare Ground		0%
% Exposed rock		0%
% Bryophyte/lichen cover		0%
% Heath		0%
% Graminoids		90%
Mean vegetation height		5cm
Fossitt (2000) Habitat Classification		**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat		**No**

Plate 2-14 The proposed substation is located in a field of improved agricultural grassland with areas of wet grassland and scrub

2.17 Proposed Borrow Pit

The proposed borrow pit is located in a field of **Improved agricultural grassland (GA1)** dominated by perennial rye grass (*Lolium perenne*) and Yorkshire fog (*Holcus lanatus*) (Plate 2-15). It is accessed via a local road to the west of the field and existing **Buildings and artificial surfaces (BL3)** track into the site.

Table 2-15 Relevé results at the location of the proposed borrow pit

Turbine 11	Grid reference: ITM X: 552581, Y: 756523	Date: 23/11/2023
Species	Common Name	Percentage cover (%)
Vascular Plants		
Lolium perenne	Perennial ryegrass	60
Holcus lanatus	Yorkshire fog	35
Trifolium repens	White clover	10
Taraxacum officinale	Dandelion	0.5
Bellis perennis	Common daisy	0.5
Rumex obtusifolius	Broad-leaved dock	0.25

% Tree Cover	0%
%Bare Ground	0%
% Exposed rock	0%
% Bryophyte/lichen cover	0%
% Heath	0%
% Graminoids	95%
Mean vegetation height	3cm
Fossitt (2000) Habitat Classification	**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat	**No**

Plate 2-15 The proposed borrow pit located in a field of improved agricultural grassland, with an earth bank to the south

2.18 Proposed Woodland Replanting Area

The area which is proposed to be replanted comprises fields of **Improved agricultural grassland (GA1)** dominated by perennial rye grass (*Lolium perenne*) and Yorkshire fog (*Holcus lanatus*) (Plate 2-16). Some areas have been poached by livestock and therefore have small amounts of bare ground present. These fields are not highly improved agricultural lands and are very wet in areas with rushes encroaching (Plate 2-16). The fields are delineated by dry vegetated **Drainage ditches (FW4)** and short stretches of **Hedgerows (WL1).**

Table 2-16 Relevé results at the location of the proposed woodland replanting area

Proposed replanting area	**Grid reference: ITM X: 554268, Y: 756021**	**Date: 23/11/2023**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Lolium perenne	Perennial rye grass	50
Holcus lanatus	Yorkshire fog	30
Ranunculus repens	Creeping buttercup	10
Juncus effusus	Soft rush	1
Trifolium repens	White clover	1
Bellis perennis	Common daisy	0.25
Non-vascular Plants		
Pointed spear moss	*Calliergonella cuspidata*	2
% Tree Cover		0%
%Bare Ground		5%
% Exposed rock		0%
% Bryophyte/lichen cover		2%
% Heath		0%
% Graminoids		81%
Mean vegetation height		5cm
Fossitt (2000) Habitat Classification		**Improved agricultural grassland (GA1)**
Affinity to Annex I habitat		**No**

Plate 2-16 The proposed replanting area is predominantly moderately improved agricultural grasslands, with wet areas and some rush encroachment

2.19 Proposed Peat Repository Areas

Four peat repository areas are proposed to the southwest of T10, southeast of T7, northwest of T11 and north of T6. All peat repository areas are located within **Cutover bog (PB4)** of varying quality and degree of revegetation and regeneration. The areas to the southwest of T10, southeast of T7 and north of T6 are dominated by bare peat with little revegetation except for small amounts of rushes (*Juncus* sp.) and common cottongrass (*Eriophorum angustifolium*) (Plate 2-17 and Plate 2-18). The proposed peat repository area to the northwest of T11 is more highly revegetated with species including ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*) and common cottongrass as well as small areas of gorse (*Ulex europaeus*) scrub (Plate 2-19).

Plate 2-17 The peat repository area to the southeast of T7 is dominated by bare peat with little revegetation

Plate 2-18 The peat repository area to the north of T6 is dominated by bare cutover peat

Plate 2-19 The peat repository area to the northwest of Turbine 11 is highly revegetated

2.20 Proposed Peatland Enhancement Area

The peatland that is proposed to be rewetted is an uncut **Raised bog (PB1)** in the southeastern portion of the site. The dominant species varies between the heaths ling heather (*Calluna vulgaris*), cross leaved heath (*Erica tetralix*), and purple moor grass (Plate 2-20), with other species identified in this area including deer grass (*Trichophorum germanicum*), common cottongrass (*Eriophorum angustifolium*), carnation sedge (*Carex panicea*) and bog asphodel (*Narthecium ossifragum*). This area is also designated as Article 17 Degraded raised bog still capable of natural regeneration. It is significantly raised above the surrounding **Cutover bog (PB4)** (Plate 2-21).

Table 2-17 Relevé results at the location of the Proposed Peatland Enhancement area

Proposed peatland enhancement area	**Grid reference: ITM X: 555119, Y: 755964**	**Date: 23/11/2023**
Species	**Common Name**	**Percentage cover (%)**
Vascular Plants		
Calluna vulgaris	Ling heather	50
Trichophorum germanicum	Deer grass	15
Eriophorum angustifolium	Common cottongrass	10
Carex panicea	Carnation sedge	5
Erica tetralix	Cross leaved heath	2

Molinia caerulea	Purple moor grass	1
Narthecium ossifragum	Bog asphodel	0.5
Non-vascular Plants		
Sphagnum capillifolium	Acute leaved bog moss	5
Sphagnum capillifolium ssp. *rubellum*	Red bog moss	5
Sphagnum palustre	Blunt-leaved bog moss	5
Cladonia portentosa	Reindeer lichen	0.5
% Tree Cover		0%
%Bare Ground		5%
% Exposed rock		0%
% Bryophyte/lichen cover		15.5%
% Heath		52%
% Graminoids		31%
Mean vegetation height		15cm
Peat depth		>1m
Fossitt (2000) Habitat Classification		**Raised Bog (PB1)**
Affinity to Annex I habitat		**Yes**

Plate 2-20 The area of raised bog to be restored

Plate 2-21 The area of peatland to be restored is raised significantly above the surrounding cutover bog

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