



Technical Appendix 8.3 Peatland Condition Assessment

Dalfad Wind Farm

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Basis of Report

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Table of Contents

Basis of Report	ii
1.0 Introduction	1
1.1 Scopes and Objectives.....	1
1.2 Proposed Development.....	2
2.0 Basis for Peatland Condition Assessment.....	4
2.1 Policy Background.....	4
2.2 Definition of Peat	4
2.3 Definition of Peatland Condition	6
3.0 Desk Assessment of Peatland Condition	8
3.1 Site Characteristics	8
3.1.1 Topography	8
3.1.2 Hydrology	8
3.1.3 Hydrogeology	8
3.1.4 Sensitive Receptors	8
3.1.5 Groundwater Dependent Terrestrial Ecosystems (GWDTE)	9
3.1.6 Peatland Classification	9
3.2 Land Management Context	9
3.2.1 Mining and Quarrying	9
3.2.2 Agriculture and Forestry	10
3.2.3 Other Management	10
3.3 Peatland Condition Indicators.....	11
3.3.1 Peat Depth	11
3.3.2 Peat Characteristics	11
3.3.3 Near Natural Features	12
3.3.4 Restored Features.....	12
3.3.5 Artificial Drainage	12
3.3.6 Peatland Erosion	13
3.3.7 Peatland Tracks	13
4.0 Peatland Condition Assessment.....	14
4.1 Field Observations	14
4.2 Infrastructure Assessment.....	17
5.0 Conclusion.....	18



Plates in Text

Plate 2-1 Typical Peat Profile	5
Plate 2-2 Framework for Assessing Peatland Condition	6
Plate 3-1 Areas of made ground comprising mixed superficial and mining spoil	10

Photographs in Text

Photograph 4-1 High grazing pressure noted across the Site, specifically in the southeast.	14
Photograph 4-2 Sphagnum species identified within wetter areas of the modified peatland on Site	15
Photograph 4-3 Mixed age forestry found on Site	15

Figures

Figure TA8.3.1 Erosional Features and Landuse

Figure TA8.3.2 Peatland Condition



1.0 Introduction

SLR Consulting Ltd (SLR) were commissioned by Brockwell Energy Limited ('the Applicant') to undertake a Peatland Condition Assessment (PCA) at the proposed Dalfad Wind Farm ('the Proposed Development'), located approximately 4 km north-east of Cumnock, and 28 km east of Ayr, within East Ayrshire Council (EAC) administrative area, as shown on **Figure 1.1** of the Environmental Impact Assessment (EIA) Report.

The assessment has been prepared by a team of geotechnical engineers, geologists, peatland specialists and hydrogeologists / hydrologists with extensive experience undertaking surveys and assessments in peatland environments, specialising in the assessment of renewable power generation and grid projects across the UK and Ireland.

The team was led by Dr. Chris Marshall, Principal at SLR. Chris holds a BSc (Hons) Environmental Geology, an MSc in Geochemistry and a PhD in Earth Sciences, with 10 years of experience in peatland condition and restoration monitoring and assessment including peer reviewed scientific papers, policy documents, governmental reports and membership of scientific and technical advisory groups.

This report has been developed alongside and should be read in conjunction with **Chapter 8: Geology, Hydrology, Hydrogeology and Peat** and the following Technical Appendices of the EIA Report:

- Technical Appendix 8.1: Peat Landslide Hazard and Risk Assessment (PLHRA)

1.1 Scopes and Objectives

This report covers the extent of peatland and where present the baseline peatland condition present within the Site to identify areas of active peatland and ensure that peat disturbance of these areas is minimised where technically feasible during detailed design and construction of the Proposed Development. Given the site is predominantly located on areas of made ground associated with historic quarrying and mining activities and lack peat deposits and peatland habitat, large areas of the site are considered to be scoped out from the PCA. The PCA has been undertaken in accordance with best practice guidance^{1,2,3,4,5,6,7}.

This PCA aims to:

- 1 Quantify the current condition status of peatland habitats on-site.
- 2 Determine the impact of the Proposed Development on peatland habitats on-site.

¹ Burden, A., Radbourne, A., Williamson, J., Evans C., 2020 A rapid method for basic peatland condition and national-scale satellite analysis

² Bradley, A.V., Mitchell, E., Dryden, I., Fallaize C., Islam, M.T., Large, D.J., Andersen, R., Marshall C., (In press) Analysis of an InSAR "bog breathing" based classification of peatland condition relative to field observations in Cairnsmore NNR, NatureScot Research Report 1269

³ Crichton Carbon Centre (2015) Annex 1 Field Protocol and Guidance, Developing Peatland Carbon Metrics and Financial Modelling to Inform the Pilot Phase UK Peatland Code' Report to Defra for Project NR0165.

⁴ JNCC. 1994. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 8 Bogs. JNCC, Peterborough.

⁵ SNH Peatland Condition Assessment <https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf> [accessed July 2026]

⁶ NatureScot (June 2023). *Advising on Peatland Habitats and Carbon-rich Soils in Development Management*. Revised March 2026. Available at: <https://www.nature.scot/doc/advising-peatland-habitats-and-carbon-rich-soils-development-management>

⁷ NatureScot Research Report 1404 – Active peatland and peatland condition



- 3 Inform development design and evidence the application of the requirements of the mitigation hierarchy in the Scottish Government's National Planning Framework 4 (NPF4)⁸ and the steps that development proposals must follow to reduce their environmental impact, namely:
 - **Avoid:** Remove the impact at the outset
 - **Minimise:** Reduce the impact
 - **Restore:** Repair damaged habitats
 - **Offset:** Compensate for any remaining impact, preferably on-site

The PCA included the following data collection activities:

- Mapping key peatland condition metrics derived from open access satellite imagery including the distribution and cover of bare peat, non-peat habitats and mineral soil; distribution of drainage (both natural and artificial); erosion features (such as footpaths, hags, gullies, drained pools, and peat landslip scars); and land-use patterns (including burn scars, tracks, and livestock pens). Additionally, the identification of main drainage pathways off-site.
- Combining peatland condition metrics with contextual data regarding the management of the Proposed Development, including ecological and peat depth data gathered at the area of the Proposed Alignment, and external resources (including deer management group data etc.).
- A field-based peatland condition assessment to validate and provide further information on peatland condition across the site within a 100 m grid.

The data collected is then used to produce a conceptual model derived from the PCA which will guide and demonstrate:

- How peatland condition is distributed across the Proposed Development, address the likelihood of extensive 'active' or near natural peatland being present across the Proposed Development and identify areas of particularly good condition peatland or refugia that should be avoided by design.
- How, through site investigation and iterative design, the Proposed Development has been structured and designed to avoid, so far as reasonably practicable, areas of active peatland;
- Identify areas of peatland with the greatest potential for enhancement and the opportunities and risks associated with peatland restoration at and within the area of the Proposed Development.

1.2 Proposed Development

The Proposed Development will comprise up to 14 wind turbines and associated infrastructure including Battery Energy Storage (BESS). In addition to the turbines and BESS, the Proposed Development will include the following ancillary infrastructure:

- turbine foundations;

⁸ Scottish Government (2023) National Planning Framework 4. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2022/11/national-planning-framework-4-revised-draft/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4-revised-draft.pdf>



- crane hardstands;
- a site entrance;
- internal and private access road network;
- watercourse crossings;
- transformers and underground cables; and
- an on-site substation / switchgear building.

Temporary infrastructure required for construction will include:

- two construction compounds;
- crane assist pads;
- blade laydown supports;
- boom supports;
- laydown areas;
- a concrete batching plant; and
- potential excavations/borrow pit workings.

Full details of the Proposed Development are provided in **Chapter 2: Project Description** and on **Figure 1.2**.



2.0 Basis for Peatland Condition Assessment

2.1 Policy Background

NPF4 Policy 5d, requires that '*where development on peatland, carbon-rich soils or priority peatland is proposed, a detailed site specific assessment will be required*'. This should include peat depth surveys (initial, detailed and additional information), Peat Landslide Hazard Risk Assessment (PLHRA), and detailed habitat surveys (National Vegetation Classification (NVC)), including an assessment of condition. As such under NPF4, any development on peatlands must undergo a detailed site-specific assessment.

For the Proposed Development the following detailed site-specific assessment has been undertaken:

- **Peat Depth Surveys:** To determine the extent and depth of peat.
- **Peat Landslide Hazard Risk Assessment (PLHRA):** To assess the risk of peatland instability.
- **Habitat Surveys:** Including National Vegetation Classification (NVC) surveys to assess the types of habitats present.
- **Peatland Condition Assessment:** to determine the condition of peatland habitat present on site and guide adherence to the mitigation hierarchy outlined in NPF4 including avoidance of peatland in near natural condition.

PCA in Scotland is generally categorised into four conditions for assessment although Peatland Code subdivides these further to link with emission factors:

- 1 **Near-Natural:** Dominated by peat-forming species with minimal human impact.
- 2 **Modified:** Shows signs of human impact such as grazing and burning.
- 3 **Drained:** Affected by artificial drainage, leading to altered vegetation.
- 4 **Actively Eroding:** Characterised by extensive bare peat surfaces and significant erosion.

Priority Peatland Habitats are also assessed by NatureScot and include blanket bogs, montane bogs, and other peat-forming communities. These habitats are considered crucial for biodiversity and carbon sequestration. The guidance emphasises avoiding impacts on these high-quality habitats and is assessed using JNCC Site of Special Scientific Interest (SSSI) criteria.

Ideally (a PCA) in a development context should provide enough information on key condition indicators to:

- Provide a baseline of pre-development condition and likely priority peatland status.
- Guide the location of infrastructure and evidence adherence to the mitigation hierarchy.
- Provide information on opportunities for and types of compensatory restoration and habitat enhancement on site.

2.2 Definition of Peat

Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the degree of decomposition.



Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material, and the peat 'grows' in-situ.

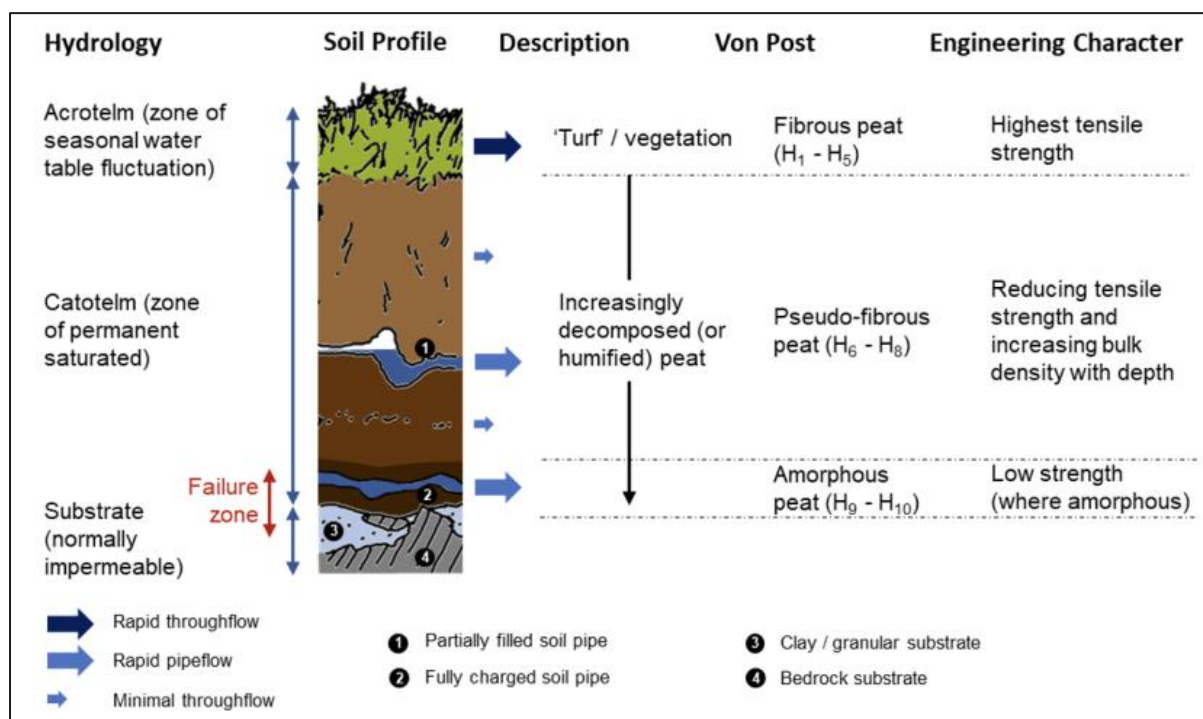
Though different thresholds are used to define peat, SEPA and NPF4 uses the following Joint Nature Conservation Committee (JNCC) report 445 'Towards an Assessment of the State of UK Peatlands'⁹ definition for classification of peat deposits:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5 m deep;
- Peat: a soil with a surface organic layer greater than 0.5 m deep which has an organic matter content of more than 60 %; and
- Deep Peat: a peat soil with a surface organic layer greater than 1.0 m deep.

There are two principal types of peat in a near natural peatland (see Plate 2-1):

- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1 m to 0.6 m deep.
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling.

Plate 2-1 Typical Peat Profile¹⁰



⁹ Joint Nature Conservation Committee (JNCC), 2011. *Towards an assessment of the state of UK peatlands*. JNCC Report No. 445. JNCC, Peterborough.

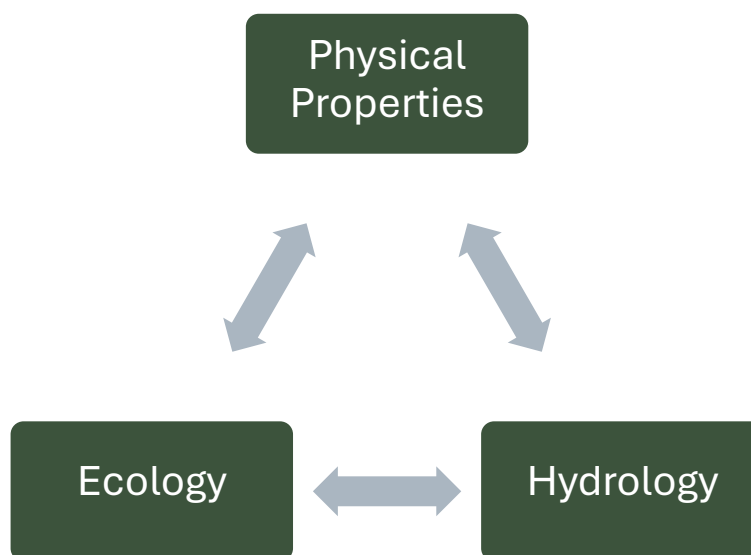
¹⁰ Mills, A.J. and Rushton, D. (2023). *A Risk Based Approach to Peatland Restoration and Peat Instability*. NatureScot Research Report 1259. Available at: <https://www.nature.scot/doc/naturescot-research-report-1259-risk-based-approach-peatland-restoration-and-peat-instability>



2.3 Definition of Peatland Condition

Peatland condition reflects a combination of the hydrological, physical (mechanical) and ecological characteristics of a peatland (Plate 2-2). In a functioning, actively accumulating peatland each exists within a state of dynamic equilibrium acting through a series of negative feedbacks to buffer against external forcing (e.g climate) ensuring the continued growth and development of the peatland. An ecohydrological basis is commonly used to determine peatland condition although often there is a focus on peatland vegetation due to the expertise of ecological assessors and the difficulty in direct measurement of peatland hydrology and peat condition during a single field campaign.

Plate 2-2 Framework for Assessing Peatland Condition



Various peatland condition assessment protocols exist for blanket peatland in Scotland and elsewhere within the UK focusing on evaluating the health and functionality of peatlands, which are crucial for carbon storage, water regulation, and biodiversity. Common key indicators of peatland condition include the presence of extensive Sphagnum moss, the extent of bare peat, and evidence of grazing or burning. A universally accepted measure of peatland condition does not exist and is therefore somewhat subjective. Consequently, all peatland condition assessments rely to a certain extent on the interpretation of key metrics by the surveyor. There are also common misconceptions regarding peatland condition for example;

- Vegetation often lags peatland condition, for example refugia exist on all but the most degraded peatland and therefore low cover of peat-forming species can be expected even on drained and actively eroding peatlands. Likewise in rewetted peatlands, vegetation often lags hydrology with dry indicator species persisting even after rewetting. The presence of low cover peat forming species is not an indicator of active peatland.
- Key positive indicators such as peatland microtopography can be present in full but each component hydrologically isolated from other parts due to deep incision particularly on upland peats indicating that full functionality is not present.
- Small (quadrat) scale observations are generally unrepresentative of peatland condition at larger scale, therefore whilst useful for identifying species present,



peatland hydrology and mechanics often operates on multiple scales not captured by this approach. Also, due to canopy effects these measures are often incompatible with remote sensing data, limiting their ability to be upscaled using new technologies for monitoring peatland condition e.g. InSAR.

In order to counter this and provide a means of upscaling NVC data across the Proposed Alignment, the PCA uses a combination of a desk study with the field based approach, and metrics based on the rapid peatland condition assessments supplemented by specific information required for the JNCC SSSI selection criteria on a 100 m grid. The results can be seen within the following sections of this report namely a desk study of peatland condition indicators on site and a field validation of peatland condition indicators not visible from satellite imagery followed by in depth analysis of Peatland Condition within the footprint of infrastructure within the Proposed Development.



3.0 Desk Assessment of Peatland Condition

3.1 Site Characteristics

3.1.1 Topography

The Site can be characterised by a gentle sloping topography that generally slopes southwest. The elevation varies from 285 m Above Ordnance Survey (AOD) in the north to 192 m AOD in the south. The Site contains several independent hills including, Peat Hill (244 m AOD) in the north and Hawk Hill (264 m AOD) in the centre of the Site.

3.1.2 Hydrology

A review of the Scotland's Environment map¹¹ shows that the Site is drained primarily by the Glenmuir Water, located to the south of the Site, which flows east to west and subsequently joins the Lugar Water to the southwest. Surface water within the Site is drained by a network of tributaries, including the Glenmuir Burn and Duncanziemere Burn, which generally follow the topographic gradient and drain towards the southwest into the Glenmuir Water. The Gass Water drains the northern extent of the Site, flowing east to west before joining the Lugar Water. Several unnamed tributaries within the north of the Site contribute to the Gass Water.

In addition, there are several drainage channels across the Site, associated with historic mining activity. These drainage channels flow to the aforementioned tributaries and streams.

3.1.3 Hydrogeology

BGS online data¹² indicates that the Site is predominantly underlain by Carboniferous sedimentary rocks as part of the Clackmannan Group and the Strathclyde Group. These deposits are characterised as a moderately productive aquifer where flow is virtually all through fractures and other discontinuities within a multi layered aquifer. The Scottish Coal Measures Group is also classified as a moderately productive cyclic multi layered aquifer.

An unnamed igneous intrusion located in the western extent of the Site is classed as a low productivity aquifer whereby flow is virtually all through fractures and other discontinuities. Small amounts of groundwater would be expected in near surface weathered zones.

The SEPA Water Classification Hub¹³ identifies the Site to be underlain by the Cumnock waterbody (ID:150646) with an overall classification of "poor".

3.1.4 Sensitive Receptors

Review of NatureScot's SiteLink¹⁴ indicates that the following designated sites are noted within the study area, as shown on **Figure 6.1**:

- Muirkirk Uplands Special Site of Scientific Interest (SSSI) which is located along the eastern boundary of the Site and 500m north of the Site and has been designated for blanket bog upland habitats, breeding and non-breeding bird assemblages;

¹¹ Scotland's Environment Website. *Scotland's Environment Map*. Available at: <https://www.environment.gov.scot/maps/scotlands-environment-map/> (Accessed July 2026)

¹² British Geological Survey (BGS) (2026). *GeoIndex Onshore*. Available at: <https://mapapps.bgs.ac.uk/geoindex/home.html> (Accessed July 2026)

¹³ SEPA (2026) *Water Classification Hub*. Available at: <https://informatics.sepa.org.uk/WaterClassificationHub/> (Accessed July 2026)

¹⁴ NatureScot (2026) *SiteLink*. Available at <https://sitelink.nature.scot/map>



- Muirkirk and North Lowther Uplands Special Protection Area (SPA), located along the eastern boundary of the Site and 500m north of the Site and has been designated for breeding and non-breeding bird assemblage; and
- Airds Moss Special Area of Conservation (SAC) which is located approximately 500m north of the Site and has been designated for blanket bog habitats.

Potential impacts as a consequence of the Proposed Development on the designated sites are considered in **Chapter 6: Ecology**.

3.1.5 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

Review of the NVC habitat mapping concluded that GWDTE's are sustained by incident rainfall and local surface water runoff, therefore the buffers proposed in SEPAs GWDTE guidance need not apply. Further details on GWDTE are provided within **Chapter 6: Ecology** and **Chapter 8: Geology, Hydrology, Hydrogeology and Peat**.

3.1.6 Peatland Classification

The Carbon and Peatland Map 2016¹⁵ indicates that the Site is predominantly located on mineral soil and class 5 peatland. Class 5 peatlands are not identified as priority peatlands habitats; however, soils may be carbon-rich and deep peat may be present. An area of class 1 peatland is indicated in the southwest of the Site. Class 1 peatland is considered nationally important priority peatland with carbon rich soils and areas of deep peat which are likely to be considered of high conservation value. There is no proposed infrastructure located within the area of Class 1 peatland.

The Carbon and Peatland Map provides an indication of the likely presence of peatland and should not be used in development management decision making with on-site specific detailed peat surveying and assessment required to determine the presence of peat which is detailed in later sections.

3.2 Land Management Context

3.2.1 Mining and Quarrying

The Mining Remediation Authority (MRA) map¹⁶ indicates that much of the north and west of the Site is located within a development high-risk area due to historic underground and opencast coal mining. These areas include sections of the former Duncanziemere, Dalfad and Gasswater collieries. Recent mining disturbance remains visible across parts of the Site, though much of the Site has been backfilled, there are areas requiring restoration.

JWHRoss prepared a Coal Mining Risk Assessment (CMRA)¹⁷ at the Site in August 2023, the results of which have informed the Proposed Development layout. The CMRA is presented as Technical Appendix 8.6.

BGS records don't record historical aggregate pits within the Site; however, there is evidence on freely available historical OS maps of limestone quarries and limekilns alongside the

¹⁵ NatureScot (2016) *Carbon and Peatland Map*. Available at: <https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/>

¹⁶ Mining Remediation Authority (Coal Authority) 2026. *Interactive Map Viewer*. Available at: <https://datamine-cauk.hub.arcgis.com/>

¹⁷ JWHRoss (August 2023), Mining Stability Report Including Past Mining Risk Assessment. Proposed Windfarm Development, Glenmuir, East Ayrshire.



Glenmuir Burn and “whinstone” quarries within the intrusive igneous rocks to the west of the Site.

Infrastructure on the Site is primarily associated with the legacy operations of the former Dalfad Opencast Mine. Large areas of the Site comprise made ground, reflecting extensive historic mining, surface road construction and the reworking of overburden. Made ground is present across much of the Proposed Development infrastructure and is particularly pronounced at the edges of the former excavation areas, where redeposited materials have been placed during restoration phases. In several locations, made ground has been remediated, and there is potential that peat or peat-forming materials were used in parts of the reinstatement process.

The made ground across the Site appears to be variable in composition and depth, with the potential for voids, heterogenous fill layers and uneven consolidation. Most areas have undergone some degree of reworking with only limited parts of the original landform remaining. The historical coal mining has removed and/or disturbed much of the peatland that may have been present on Site historically. Remediation of the historic mining has resulted in a number of cells and areas of made ground comprising a mix of former organic rich soils, mineral soils, mining spoil which overlie or replace much of the original soil on the site. In some areas these have led to perched water tables which have been colonised by wetland species, but which do not contain organic rich soils.



Plate 3-1 Areas of made ground comprising mixed superficial and mining spoil

The extent of historic mine workings and made ground derived from historical mapping can be seen in **Figure TA8.3.1**.

3.2.2 Agriculture and Forestry

Large portions of the Site are characterised by rough grazing, with sheep present across almost all fields that are not associated with forestry or former coal mining activities. Commercial forestry is present within the Site, primarily in the central eastern extents. These forested areas are at varying stages of maturity, with some areas exhibiting evidence of historic felling with young growth now present. No forestry operations were observed to be ongoing during site surveys. In addition, small areas of natural and semi-natural woodland are present in the northern and south-western extents of the Site.

3.2.3 Other Management

Wildfire and Managed Burning

There was no evidence of recent burning identified.



Deer Management

3E Services Ltd on behalf of EAC details a deer management plan in the east Ayrshire council district. The Site is primarily associated with roe and red deer. Although no formal population count has been undertaken, field evidence indicates moderate grazing and browsing pressure, particularly along woodland edges, re-generating scrub, and rough grazing habitats. Deer management within the area follows a precautionary, impact-led approach which aligns with the Deer Code and wider East Ayrshire objectives for woodland expansion and habitat restoration.

3.3 Peatland Condition Indicators

3.3.1 Peat Depth

Peat depth is an important aspect of peatland condition as it is an indicator of:

- Whether peat is present or absent, e.g. where the probing recorded less than 0.5 m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as 'peaty soils'. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density.
- Long term peatland resilience to external forcing e.g. thicker peats have consistently sequestered carbon over a longer period than more marginal peat areas.
- Long term degradation, areas of extensive drainage are likely to have lost peat from oxidation or erosion, alongside compaction which can reduce peat depths further.

Peatland conditions across the Site were assessed through a combination of peat depth probing, peat coring, hand pit investigations, and visual interpretation, following recognised best-practice guidance for developments on peatland.

An initial low-resolution peat survey was undertaken on a 100 m grid to establish the broad extent and depth of peat and inform preliminary infrastructure design. This was followed by a detailed survey focused on proposed infrastructure locations, with probing undertaken at closer intervals depending on the feature being assessed. Peat depth was measured using a graduated fibreglass probe, with depths recorded to the nearest 0.1 m and locations logged using handheld GPS. In addition to probe measurements, visual assessment was used where probing was not possible or unnecessary, including areas of steep slopes, exposed bedrock, made ground, archaeological constraints, and locations where surface conditions clearly indicated the presence or absence of peat.

The nature of underlying substrates and peat consistency were interpreted from probe refusal characteristics and extraction resistance, with targeted hand pits excavated where uncertainty existed. To further assess peat condition and profile characteristics, peat cores were collected using a Russian auger and described according to the Von Post humification scale. Together, these surveys provided a robust understanding of peat distribution, depth, condition, and underlying ground conditions across the Site.

3.3.2 Peat Characteristics

Peat is defined in Scotland as a soil containing an organic layer greater than 0.5 m in thickness. Accordingly, probe depths of 0.5 m or less were classified as peaty or mineral (non-peat) soils rather than true peat. While peaty and organo-mineral soils can contain relatively high organic matter content, they do not meet recognised peat definitions due to their limited depth and lower carbon storage capacity. Across the Site, a total of 2,620 probe and survey points were completed.



The results indicate that peat is not a dominant feature of the Site, with an average recorded depth of only 0.4 m. While isolated pockets of deeper material were encountered, including a maximum depth of 6.3 m, these are localised rather than extensive. Overall, 78% of probe locations recorded depths of 0.5 m or less, confirming that most of the Site comprises non-peat soils. Of the remaining 22% of locations where depths exceeded 0.5 m, some measurements are likely to reflect soft mineral soils rather than peat, owing to the widespread occurrence of soft substrates across the Site. The survey therefore demonstrates that peat is generally absent across much of the Site, with only limited and localised areas supporting peat deposits, as illustrated on **Figure TA8.2.1**.

Hand pit and peat core investigations were undertaken at selected locations to verify the nature of materials encountered during probing and assess whether deeper probe depths represented true peat deposits. The results indicate that a significant proportion of deeper probe measurements are likely attributable to soft mineral soils rather than peat. Of the nine locations investigated, five (PC01, HP01, HP03, HP04 and HP05) contained no peat and comprised sands overlying silty or sandy clays. At two further locations (PC03 and PC04), peat was present but was relatively shallow (0.3 m and 0.1 m thick respectively) and underlain by mineral clay soils. Only one peat core (PC02) confirmed the presence of peat exceeding the Scottish peat threshold of 0.5 m, with approximately 0.8 m of peat overlying sandy clay. An additional hand pit (HP02) recorded 0.5 m of peat, although field observations suggested this may be reworked material. Overall, the intrusive investigations demonstrate that many locations where probing recorded greater depths are underlain by sands, silts and clays rather than extensive peat deposits. These findings support the wider peat survey results, which show that peat is generally limited and discontinuous across the Site, with most areas comprising made ground, mineral or peaty mineral soils rather than true peatland.

3.3.3 Near Natural Features

No near natural features were observed from aerial imagery or during field surveys. Areas without evidence of drainage or erosion appear to be primarily modified by rough grazing with peatland species generally replaced by grasses. Locations where peat was identified were modified by artificial drainage features.

3.3.4 Restored Features

From aerial imagery, two areas of restoration were identified, located in the northeastern and southwestern extents of the Site likely undertaken between 2016 and 2018 from historic aerial imagery. Restoration is noted to be in the form of gully blocking of narrow drains in both instances, likely associated with the reinstatement of historic mining works and was completed concurrently with the other landscaping works at the time. The southwestern area is distant from the Proposed Development and impacts on this are not expected. The northeastern area is located adjacent to the Proposed Development northeast of T4, the design largely avoids directly impacting the restored features on peat over 0.5 m in depth and as such the likely impacts on the peatland and associated hydrology is considered to be low. The erosional and land use features across the Site are shown on **Figure TA8.3.2**.

3.3.5 Artificial Drainage

Almost the entire Site is modified either through previous mine workings, artificial drainage features and forestry. A desk-based review of peat areas within the Site showed approximately 3.6 km of artificial drainage in the form of drains, these appear to be narrow width (<0.5 m) and typically active. These features are typically concentrated in areas of rough grazing and the small areas of peat.



3.3.6 Peatland Erosion

A desk-based review of peat areas within the Site indicates that no features of active peat erosion are present. One area, initially thought to exhibit microerosional characteristics was confirmed during field survey and from aerial imagery to comprise made ground with a thin layer of redeposited peaty soil. The wider Site shows no evidence of haggling, gullyng, microerosion or other erosional forms typically associated with degraded peatland. Instead, the landscape is dominated by restored substrates and extensive made ground surfaces.

3.3.7 Peatland Tracks

The Site contains approximately 8.6 km of All terrain Vehicle (ATV tracks) primarily associated with agricultural usage. The ATV tracks appear to be acting as shallow drains in areas of peat with many clearly boggy areas of particularly wet ground. Track impact is therefore considered artificial drainage within this report, although due to the likely shallow nature of impacts a reduced impact radius of 10 m is applied.



4.0 Peatland Condition Assessment

Key peatland condition metrics have been mapped, through a desk-based assessment of observed peatland erosional and landscape features, supported by ground validation during peat depth surveys undertaken in 2026. Peatland condition classes across the Site are shown on **Figure TA8.3.2**. The Peat condition assessment is specific to where peat depth surveys identified peat within the Site.

Peatland within the Site is predominantly classified as Modified comprising 62.03 ha or 63 % of peat areas. It is likely that these areas have high historic herbivore impacts including trampling, puddling and fertilisation by sheep and deer, which has contributed to the conversion of areas of peatland to wet heath, *Juncus mires* and extensive tussocking.

Drained Artificial peatland condition comprises approximately 32.6 ha or 33 % of peat areas. In open areas this is primarily associated with active hill drains, ATV tracking and herbivore tracking. In afforested areas this is associated with 12.21 ha of standing mixed species coniferous plantation forestry with associated furrows, feeder and collector drains.

Areas in the southwest of the Site are predominantly classed as Highly Modified Pastural condition comprising 3.8 Ha or 3.8 % of peat areas. These areas have undergone significant landscape alteration through fertilisation and plant community alteration through deliberate and passive seeding of grassland species to create areas of rough pasture and semi-improved grassland. These areas are intensively grazed and likely drained through subsurface mole drain networks.

4.1 Field Observations

Field validation surveys were undertaken across the Site to verify the peatland condition and land-use characteristics identified during the desk study and aerial imagery review. The surveys confirmed that the Site is dominated by agricultural land uses, comprising a mixture of rough grazing and improved grassland, together with smaller areas of heathland, commercial forestry and land influenced by historic mining activities. Evidence of intensive grazing pressure was widespread across the Site, including extensive livestock tracks and sheep grazing activity (photograph 4-1), supporting the desk-based interpretation that agricultural management is a key influence on habitat condition in parts of the site.

Photograph 4-1 High grazing pressure noted across the Site, specifically in the southeast



Field observations confirmed that peat deposits are generally limited in extent and largely confined to isolated topographic depressions within the undulating glacial landscape. Peat surfaces were typically dry rather than waterlogged, indicating modified hydrological conditions and limited active peat-forming processes. Peat was also generally dense and compacted, consistent with long-term drying and grazing impacts. These findings support the desk study conclusion that the majority of peatland within the Site is in a modified condition and does not exhibit the characteristics of active or near-natural peatland.

Photograph 4-2 Sphagnum species identified within wetter areas of the modified peatland on Site



Vegetation surveys further validated the desk-based assessment of peatland condition. Peat-forming Sphagnum mosses (Photograph 4-2) were scarce across most of the Site and largely restricted to a small number of wetter areas in the eastern extent, adjacent to more intact peatland habitats beyond the Site boundary. Where present, Sphagnum communities were generally of low diversity and comprised species associated with relatively limited peat accumulation. In contrast, non-peatland grasses were abundant across much of the Site, while characteristic peat-forming species such as cotton grass and deer grass were largely absent. This vegetation composition is indicative of highly modified peatland that has been subject to drying, agricultural improvement and grazing pressure, resulting in a transition towards rough grazing and semi-improved grassland habitats.

Photograph 4-3 Mixed age forestry found on Site



The field surveys also confirmed the distribution of woodland and forestry identified through the desk study. Commercial forestry occupies parts of the central-eastern area of the Site and includes plantations at varying stages of maturity, together with areas of recent restocking following historical felling. Smaller areas of natural and semi-natural woodland were also recorded in the northern and south-western parts of the Site. Overall, the field validation exercise confirmed the desk study findings that peatland habitats are limited, fragmented and generally in a modified condition, with the Site predominantly characterised by agricultural grassland and other non-peatland land uses.



4.2 Infrastructure Assessment

A review of infrastructure layout indicates that the majority of the Proposed Development is not located on peatland and is unlikely to affect peatland habitats or carbon-rich soils. Turbines T1–T3, T6–T9, T11 and T13–T14, together with their associated hardstands are located either on disturbed former mining land, plantation forestry, pasture, or areas confirmed by intrusive investigation to comprise mineral soils rather than peat. Similarly, the BESS, substation, construction compounds, new track sections and track upgrade areas are all situated on shallow mineral or peaty mineral soils, with average probe depths generally below 0.5 m and no peatland indicators identified during habitat surveys. Ground investigations at these locations consistently confirmed the presence of sands, silts and clays rather than peat deposits. As a result, these infrastructure elements are not considered to be located on peatland or carbon-rich soils and were excluded from the peatland condition assessment.

Only a limited number of infrastructure elements were identified as having potential interactions with peatland habitats or carbon-rich soils and were therefore taken forward for assessment. These comprise the T4 hardstand, T5 turbine location, T10 turbine and hardstand, and T12 turbine and hardstand. These locations are associated with habitat indicators suggestive of peatland influence, including purple moor-grass, rushes and cotton grass, and are generally situated within areas mapped as carbon-rich soils. Intrusive investigations confirmed the presence of peat at the T4 hardstand, where approximately 0.7 m of peat was recorded, and at the T10 and T12 locations, where peat or peaty soils were identified overlying clay substrates. Although the T5 turbine area was not confirmed as containing peat during ground investigation, it was retained within the assessment due to the presence of peatland vegetation indicators and its proximity to areas of deeper organic soils.

Turbine 12 is located on areas in afforested peatland in the drained artificial class. These areas are dominated by monoculture plantation with intensive drainage by furrows, feeder and collector drains. Beneath the canopy the peat surface is comprised of dry dense peat dominated by needle litter and non-peatland mosses. It is considered likely that peat structure is also highly disturbed at this location, due to the ploughing techniques used. Overall, turbines on afforested peat are likely to be actively degrading and therefore peatland impacts are likely to be **Low**.

Turbines that do not avoid peat are located in areas characterised by rough and improved grazing and dry heath cover, dominated by non-peat forming grass moss species. These show high herbivore impacts, resulting in the loss of peatland species and therefore are generally characterised by a combination of Modified/Drained Artificial conditions. Peat in these areas is dry and highly compacted, subject to widespread grazing and have been subject to longstanding draining effects from surface drains and tracks. Due to the large-scale loss of peatland vegetation diversity and replacement by non-peat species, it is likely that peat accumulation is inactive and that these areas have been, and are currently, in active decline. Overall, peatlands subject to grazing where in proximity to turbine locations, were found to be widely drained, therefore, peatland impacts are likely to be Low.

Tracks associated with T5, T11 & T12 cross small areas of shallow peat within felled forestry and open improved pastureland. These areas are influenced by open hill and forestry drainage and within areas of intensive agricultural land use and are therefore classified as Modified/Drained Artificial.

Overall, the review demonstrates that potential impacts to peatland are highly localised. Most proposed infrastructure is located on non-peat substrates or previously disturbed ground, with only a small number of infrastructure elements intersecting areas where peat or carbon-rich soils were confirmed. This supports the wider site assessment, which found that peatland is limited and discontinuous across the Site and that the majority of the development footprint is situated outside areas of significant peat resource.



5.0 Conclusion

The Site is dominated by non-peatland habitat and is instead characterised by extensive areas of historic mining disturbance, restored opencast workings, made ground and agricultural land. Historic coal extraction and subsequent restoration activities have substantially altered the original landscape, resulting in large areas where natural soils have been removed, disturbed or replaced by a heterogeneous mixture of mining spoil, mineral soils and reworked organic material. Peat depth surveys, intrusive investigations and field validation confirmed that true peat deposits are limited and discontinuous across the Site. Of the 2,620 probe locations completed, 78% recorded depths of 0.5 m or less and therefore do not meet the Scottish definition of peat. Intrusive investigations further demonstrated that many apparent deep probe records reflect soft mineral substrates, including sands, silts and clays, rather than peat. The Site is therefore dominated by made ground, mineral soils and peaty mineral soils, with peat largely confined to isolated topographic depressions and small pockets within the wider landscape. Where peat does occur, it is generally modified, drained and subject to long-term agricultural or forestry management influences, with no areas of near-natural peatland identified.

The Proposed Development has largely avoided the limited areas of peat present within the Site. Most infrastructure, including the majority of turbines, hardstands, tracks, compounds, the substation and BESS, is located on disturbed mining land, forestry plantations, pasture or mineral soils and is not considered to interact with peatland habitats or carbon-rich soils. Only a small number of infrastructure elements, namely the T4 hardstand, T5 turbine location, T10 turbine and hardstand, and T12 turbine and hardstand, were identified as having potential interactions with peat or carbon-rich soils. These locations occur within peatland areas that have been substantially modified by drainage, grazing, forestry operations and historic land management. Peat deposits in these locations are generally dry, compacted and degraded, with limited peat-forming vegetation and little evidence of active peat accumulation. As a result, the affected peatland is considered to be of low ecological functionality and already in an actively degrading condition. Given the limited extent of peat affected, the highly modified nature of the peatland resource and the avoidance of the majority of peat deposits across the Site, the overall effect of the Proposed Development on peatland condition is considered to be **Low**.



Figures

Technical Appendix 8.3 Peatland Condition Assessment

Dalfad Wind Farm

SLR Project No.: 413.057968.00001

28 July 2026

Figure TA8.3.1 Erosional Features and Landuse

Figure TA8.3.2 Peatland Condition





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