Proposed 132kV Grid Connection to Daer Wind Farm

Routeing and Consultation Document

SP ENERGY NETWORKS

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March 2024

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Contents

Preface

This Routeing and Consultation Document has been prepared on behalf of SP Energy Networks (SPEN). It relates to the identification and appraisal of route options for a new grid connection to connect from the proposed Daer Wind Farm Substation to the existing substation at Moffat ("the Daer 132kV Connection Project").

This document presents the methodology and findings of the routeing study, which has been undertaken, to inform the consultation process for the Daer 132kV Connection Project.

The Routeing and Consultation Document is available to download from:
https://www.spenergynetworks.co.uk/pages/community_consultation.aspx

Representations to this consultation stage should be received no later than **Sunday 24th March 2024.** Submissions can be made to the following:

By email to: daerwfconnection@spenenergynetworks.co.uk

By post to: Daer Environmental Planner,
Alan Graham,
SPEN Environmental Planning,
55 Fullarton Drive,
Glasgow
G32 8FA

You can also call the SPEN Community Liaison Team during the consultation period on **07516 461129**

Summary

Scottish Power Energy Networks (SPEN), through its transmission licence holder Scottish Power Transmission plc (SPT) proposes to construct a new 132kV grid connection in Dumfries and Galloway, and South Lanarkshire. As the transmission licence holder, SPEN is obliged to provide this connection, which is needed to allow the proposed Daer Wind Farm development to input to the electricity network.

The proposed overhead line (OHL) will be a 132kV single circuit connection supported on double "H" wood poles connecting the proposed Daer Wind Farm Substation to the existing substation at Moffat. The overhead line design has been determined following a detailed review of the engineering and technical requirements for the connection.

The wood poles will be approximately 13-15m in height to ensure adherence with minimum safety clearances. The average span between the wooden poles will be approximately 90-110m depending on the terrain. An Infrastructure Location Allowance (ILA) is proposed of 50m to either side of the proposed OHL and temporary access routes, to allow micro siting and adjustments to be made at the construction stage.

Technical constraints require the overhead line to be terminated prior to crossing the West Coast Railway Line and Motorway (M74). From this point an underground cable will be installed to allow the grid connection to enter Moffat Substation.

This Routeing and Consultation Document provides details of the initial stages of work undertaken to identify a Preferred Route for the grid connection. This has involved the review of key environmental features of the Study Area, identification of alternative routes and analysis of route options. From the outset, SPEN has focused on reducing the environmental impact of the proposed development, whilst remaining technically and economically viable.

At this Routeing and Consultation Stage, the Preferred Route from the proposed Daer Wind Farm Substation is aligned eastwards though the commercial forest plantations of Rivox and Longbedholm to descend towards Middlegill. The overhead line would terminate to the west of the existing 400kV overhead line and railway line. From this point an underground cable would follow the alignment of the B7076 and A701 to provide a grid connection to Moffat Substation. The total length of this new 132kV grid connection is approximately 10 km.

Consultation at this route selection stage follows the approach adopted by SPEN to line routeing and is part of the ongoing engineering design, technical development, and environmental review of the proposed development. The eventual route selected by SPEN for the grid connection will take into account views expressed during this Routeing and Consultation Stage.

Following feedback from the Scoping Report submitted to Scottish Ministers, a Proposed Route will then be carried forward to detailed Environmental Impact Assessment (EIA), the results of which will be reported in an EIA Report (EIAR). This document will support the Section 37 application under the Electricity Act 1989 to the Scottish Government for consent to construct and operate the grid connection.

Any comments made during this Routeing and Consultation Stage are <u>not</u> representations to The Scottish Government Energy Consents Unit. Following submission of the Section 37 Application by SPEN, interested parties will have the opportunity to make representations to the Scottish Government on these proposals.

Project Need

1.1 Scottish Power Energy Networks (SPEN), through its transmission licence holder Scottish Power Transmission plc (SPT) proposes to construct a new 132kV grid connection supported on double wood poles in Dumfries and Galloway, and South Lanarkshire Councils. The proposed development is needed to allow the proposed Daer wind farm development comprising of 17 turbines[1], to connect to the electricity transmission network at the existing substation at Moffat (hereafter referred to as "the Daer 132kV Connection Project"). The location of the Daer 132kV Connection Project is shown in **Figure 1.1**.

1.2 SPEN operates and maintains the transmission and distribution networks in central and southern Scotland on behalf of the licence holders, SP Transmission plc (SPT) and SP Distribution plc (SPD). As a transmission licence holder, SPT is obligated "to develop and maintain an efficient, co-ordinated and economical system of electricity transmission"[2]. It is also subject to licence conditions requiring it to enter into an agreement with the system operator to carry out works and obtain consents necessary to facilitate connections for generators.

1.3 To comply with the licence obligations, SPT must provide the proposed Daer Wind Farm with a connection to the transmission system.

Legislative Framework

1.4 The legal provisions applying to the development of overhead lines (OHL) in Scotland are principally the Electricity Act 1989 and the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. All transmission licence holders are required under Section 9 of the Electricity Act to take account of the following factors in formulating proposals for the installation of overhead lines: -

a) "to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and,

b) to do what he reasonably can to mitigate any effect the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings, or objects."

1.5 SPEN interprets the words "reasonably can" to mean that it should make every effort to mitigate the environmental effects, whilst bearing in mind the technical constraints imposed by overhead transmission line technology, and its duties under Section 9 of the Electricity Act. In summary, SPEN is required to identify electrical connections that meet the technical requirement of the electricity system, which are economically viable, and on balance, cause the least disturbance to both the environment and the people who live, work and enjoy recreation within it.

[1] Proposed turbines 180m height base to tip, 150m rotor diameter

[2] S9 of the Electricity Act 1989 (as amended by the Utilities Act 2000)

Purpose of the Public Consultation Document

1.6 The purpose of this document is to provide a review of the route selection process to identify the Preferred Route alignment and invite comment. The document presents the methodology adopted for routeing the new OHL, culminating with the description of the "Preferred Route" for the grid connection.

1.7 This document also sets out the process for the consultations, which will be undertaken. This process is designed to gather feedback from stakeholders, including the public, to inform the subsequent stages of the Daer 132kV Connection Project.

1.8 Following consultation on this Preferred Route, feedback will be reviewed and considered to inform the route development process to identify the "Proposed Route".

1.9 Consultation regarding the Preferred Route was undertaken in 2022, and feedback was received regarding the proposed Rivox Wind Energy Hub development which has now been submitted to Scottish Ministers (via the Energy Consents Unit (ECU)) for consent in 2023. The proposed development by Belltown Power comprises of 29 turbines with a maximum blade tip height of 200m-230m and an energy storage facility.

1.10 The preliminary environmental appraisal of Strategic Overhead (OHL) Route Options as identified and reviewed in the Proposed 132kV Grid Connection to Daer Wind Farm Routeing and Consultation Document (August 2022) have therefore been revisited. In summary, the preliminary environmental appraisal findings remain the same and the Preferred Route Option meets the routeing objective of achieving on balance the least likely adverse environmental effects. Following technical review by SPEN the current Preferred Route has been slightly amended to accommodate the proposed Rivox Wind energy Hub turbine locations.

The Development and Consenting Process

1.11 The Project comprises three key phases:

- Phase One: Routeing and Consultation
- Phase Two: Environmental Impact Assessment
- Phase Three: Application for Consent

Phase One: Routeing and Consultation

1.12 This document relates to Phase One, which comprises a review of environmental, technical and economic considerations and the application of established step by step routeing principles to identify and appraise potential route options to establish a "preferred" route for the OHL.

1.13 SPEN is committed to ongoing consultation with interested parties, including statutory and non-statutory consultees and local communities. Whilst there is no statutory requirement to consult during the early routeing stages, SPEN nonetheless considers it good practice to introduce consultation at this stage.

1.14 Responses to the consultation process will be evaluated and the "Proposed Route" confirmed for progressing to the next stage.

Phase Two: Environmental Impact Assessment

1.15 This comprises an Environmental Impact Assessment (EIA) of the "Proposed Route". An EIA is required under The Electricity Works (EIA) (Scotland) Regulations 2017, given the nature and scale of the Daer 132kV Connection Project. The EIA process will seek to avoid, reduce and where possible, offset likely significant impacts on the environment through an iterative routeing design process for the proposed OHL.

1.16 This will initially involve the scoping of the EIA through a request to Scottish Ministers and will culminate in the production of an Environmental Impact Assessment Report (EIA Report), which will report on the effects of the construction and operation of the Daer 132kV Connection Project in its entirety.

1.17 The Scoping Report will be submitted to Scottish Ministers to seek an opinion under Provision 8 of the Electricity Works (EIA)(Scotland) Regulations 2017. This will review the proposed scope of information to be provided in the EIA Report to ensure that all relevant issues and concerns of external stakeholders are taken into account.

Phase Three: Application for Consent

1.18 Following completion of the EIA Report, SPEN will apply to Scottish Ministers for consent under Section 37 of the Electricity Act 1989 ("the Electricity Act"), as amended, to install, and keep installed, the proposed OHL identified above. In conjunction with the Section 37 application, SPEN will apply for deemed planning permission for the OHL and any ancillary development under Section 57(2) of the Town and Country Planning (Scotland) Act 1997, as amended. The EIA Report will accompany the application to the Energy Consents Unit (ECU).

Stakeholder Engagement

1.19 Stakeholder engagement, including public involvement, is an important component of the Scottish planning and consenting system. Legislation and government guidance aim to ensure that the public, local communities, statutory and other consultees and interested parties have an opportunity to have their views taken into account throughout the planning process.

1.20 Striking the right balance can be challenging, and in seeking to achieve this SPEN recognises the importance of consulting effectively on proposals and of being transparent about the decisions reached. SPEN is keen to engage with key stakeholders including local communities and others who may have an interest in the Daer 132kV Connection Project. This engagement process begins at the early stages of development of a project and continues through to construction stage once consent has been granted.

1.21 SPEN's approach to stakeholder engagement for major electrical infrastructure projects is outlined in the document "Major Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment"[3]. SPEN aims to ensure effective, inclusive and meaningful engagement with the public, local communities, statutory and other consultees and interested parties through the following key engagement steps:

[3] Scottish Power Energy Networks (2020) Approach to Routeing and Environmental Impact Assessment -Chapter 5 https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf

- Information gathering to inform the routeing stage;
- Consultation on specific requirements;
- Obtaining feedback on the Preferred Route; and
- The Environmental Impact Assessment (EIA) stage.

1.22 In addition, and as noted above, SPEN as a holder of a transmission licence, has a duty under Section 38 and Schedule 9 of the Electricity Act 1989, when formulating proposals for new electricity lines and other transmission development, to have regard to the effect of development work on communities, in addition to the desirability of the preservation of amenity, the natural environment, cultural heritage, and landscape and visual quality.

Structure of the Routeing and Consultation Document

1.23 This Document comprises of the following Chapters:

Chapter 1: Introduction
Chapter 2: Project Description
Chapter 3: Approach to Overhead Transmission Line Routeing
Chapter 4: Study Area Environment
Chapter 5: Route Options and Preferred Route Alignment
Chapter 6: Appraisal of Route Options
Chapter 7: Way Forward

1.24 This Routeing and Consultation Document is also supported by a number of Figures as listed in the contents page. At the back of the document are the References and a Glossary.

Project Team

1.25 This Report has been prepared for SPEN by Environmental Designworks, an environmental planning and landscape design practice, with specialist input from: SPEN on the proposed overhead line engineering design and technical issues; CFA Archaeology Ltd; BSG Ecology; Golder Associates; and DGA Forestry.

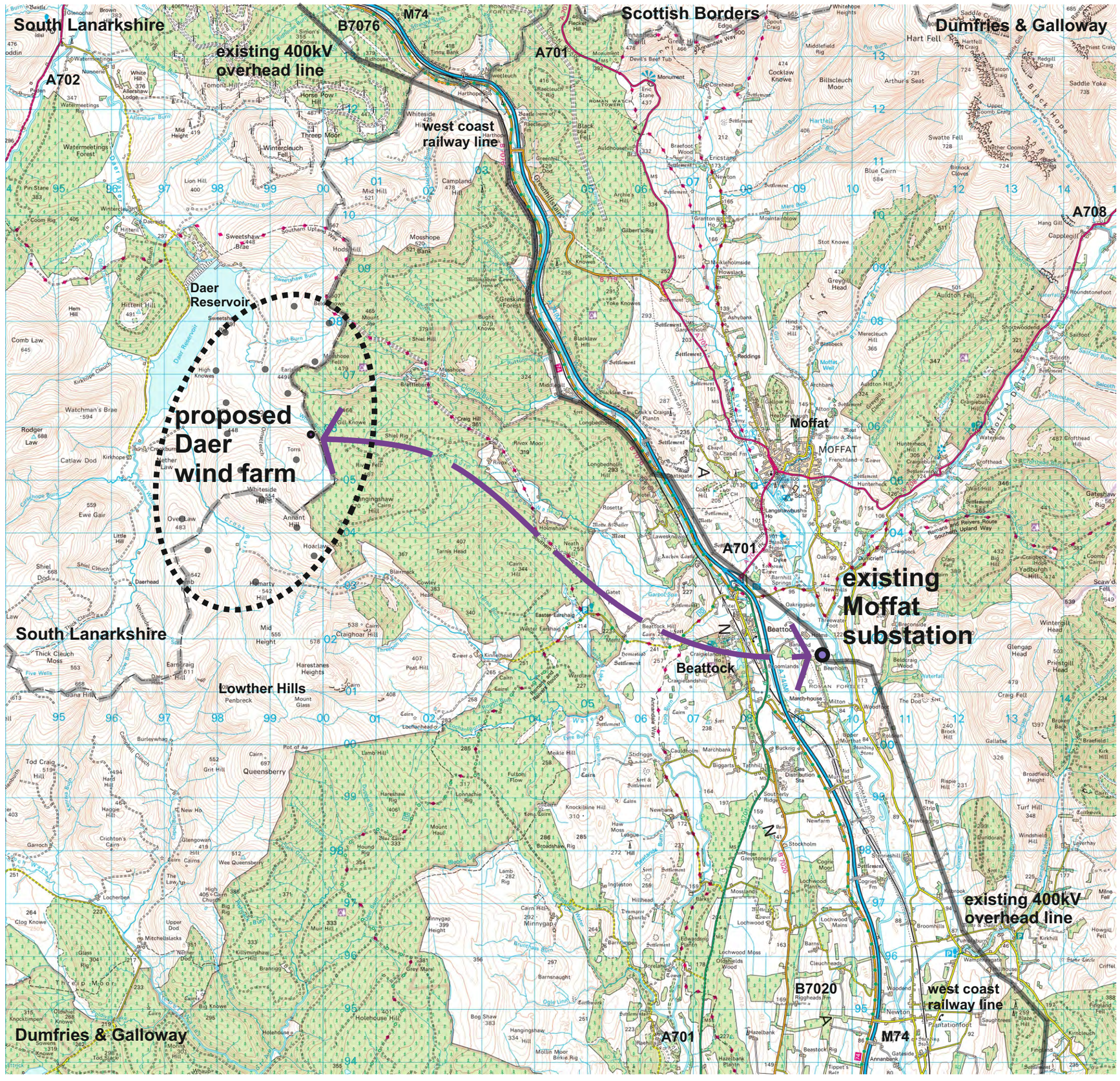
1.26 This Routeing and Consultation Document is available to view on the Internet and download free of charge at:
http://www.spenergynetworks.co.uk/pages/daer_wind_farm_132kv_connection_project.aspx

1.27 If you would like any further information or discuss any aspect of the proposed development, please contact the SPEN Project Manager either:

By email to: daerwfconnection@spenenergynetworks.co.uk

By post to: Daer Environmental Planner,
Alan Graham
SPEN Environmental Planning,
55 Fullarton Drive,
Glasgow G32 8FA

You can also call the SPEN Community Liaison Team during the consultation period on **07516 461129**



0 1 2 3 4km

figure 1.1

Title:
Location Plan

Project:
Proposed 132kV Connection to Daer Wind Farm

Scale: 1:75,000 @A3 / Bar Scale

Date: Feb 2024

SP EnergyNetworks

Environmental Designworks
Landscape Architecture + Planning

Proposed Connection

2.1 A new 132kV single circuit line is required between the proposed Daer Wind Farm development and the existing substation at Moffat to connect to the electricity grid. The proposed Daer 132kV Connection Project will be supported on double "H" design wood poles (hereafter referred to as "double wood pole"), which will carry a single 3 phase circuit.

2.2 Technical and environmental constraints associated with crossing the West Coast Railway line, M74, and around Moffat Substation require an underground cable to be installed to allow the grid connection.

2.3 A diagram and photographs of an existing double wood pole overhead line and typical underground cable trench is provided in **Figure 2.1.**

Existing Overhead Line

2.4 An existing 400kV overhead line crosses the Study Area in a north-west – south-east direction connecting Elvanfoot Substation to Moffat Substation. The overhead line is on lattice steel towers ranging in height from 40m to 60m. A minimum separation distance of 40m to the existing 400kV overhead line has been adopted for the proposed Daer 132kV Connection Project.

Overhead Line (OHL) Infrastructure

2.5 With an overhead electricity line, conductors (or wires) are suspended at a specified height above ground and supported by wooden poles or lattice steel towers, spaced at intervals. Conductors can be made of aluminium or steel strands. Most overhead lines at 132kV and above carry two 3 phase circuits, with one circuit strung on each side of a tower. An earth wire may be required to provide lightning protection.

Tower Type, Height and Span Length

2.6 The proposed overhead line will be supported on double wood poles due to the altitude and weather conditions, such as ice and wind loading, associated with the Study Area.

2.7 The height of the wood poles reflects the statutory clearances required for the conductor, which is determined by the voltage of the overhead line (the higher the voltage, the greater the safety clearance that will be required) and the span length required between poles. Wood poles will have nominal lengths ranging from 8.5m to 24m. These will be installed at a minimum excavation depth of 2m. Taking this excavation depth into account, together with topography and span lengths, it is anticipated that the wood poles for the Daer 132kV Connection Project will have a height between 13m and 15m above ground.

2.8 The section of overhead line between poles is known as the "span". With the distance between them known as the "span length". The maximum span length between double wood poles is 150m, although provision can be made for an increased distance of 200m. In typical use at low altitude, 120m is the usual span length. At higher altitude, where more extreme weather is prevalent, the span length is reduced to between 90m and 110m to take account of greater ice and wind loading factors. It is anticipated that the span length for the Daer 132kV

Connection Project, which will cross elevated ground between above 350m AOD will be 90-110m depending on terrain. Double wood poles allow deviations of up to 75 degrees.

2.9 Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity. New wood poles are dark brown in colour and weather, over time to a light grey.

2.10 The wood pole top cross-arms are galvanised steel and support the aluminium conductors on stacks of grey insulator discs. Both the steelwork and aluminium weather and darken over time.

2.11 There are three types of wood poles:

Intermediate – where the pole is part of a straight section of line and no change in direction is required. Straight sections of wood poles include section poles where segmentation is required to contain any failure in the OHL.

Angle – where the OHL requires a change of direction. All angle structures will require to be back stayed.

Terminal- where the OHL ends before entry to the Substation.

2.12 There may occasionally be a need to use lattice steel towers on wood pole OHLs. Towers are fabricated from high tensile steel, which is assembled using galvanised high tensile steel bolts with nuts and locking devices. Examples where towers may be used include crossing a watercourse with steep valley sides where the construction process for wood poles is difficult. In this situation it may be necessary to construct a steel tower either side of the watercourse to achieve the span length required to cross the valley. Other examples requiring the use of steel towers would occur if slope gradients are too steep to be able to construct and 'stay' the wood poles into the ground.

2.13 The means of connection of the OHL to the underground cable section will be achieved through using either a wooden four pole terminal structure or a single terminal steel tower. This will be confirmed as the design progresses.

Underground Cables

2.14 Where a section of underground cable is required, for example where the OHL terminates and connects into the substation, the conductors are encased in insulated material and buried in a trench of suitable depth and width, and then backfilled. Whilst the number of cables, and the depth and width of the trench depends on the circuit rating and voltage, the overall width of the trench can be further increased by other factors. The final width is dependent on, for example: the installation method; environmental issues; ground conditions; and access requirements during construction. Where connected to an overhead line, an underground cable may also involve the creation of a fenced compound for the siting of above ground terminal supports and sealing end compounds.

Maintenance

2.15 The majority of components of overhead lines are maintenance free. Weather conditions in which a line operates and the effects of the environment on exposed elements do give rise to

corrosion, wear, deterioration and fatigue after many years in service. Regular inspection identifies any unacceptable deterioration at an early stage, so action can be taken to maintain a high level of security and safety on all components in accordance with the Electricity Supply Regulations. Access arrangements for maintenance and fault repairs will be arranged with the relevant landowners and undertaken within the agreed wayleave.

2.16 There is also an ongoing requirement to ensure that any trees within the wayleave corridor are managed to maintain required safety clearances whilst the connection is in service. Walkover surveys or flyovers will identify where there is a requirement to clear wayleaves of new growth. The typical wayleave corridor for a 132kV OHL through woodland is 35m to either side of the route.

Operational Life

2.17 Depending on the severity of pollution and local weather conditions, experience indicates that the components of a new overhead line of this type would require refurbishment after approximately 40 years. At that time it is likely conductors, insulators and fittings would be replaced. Should the wind farm operation come to an end, the Daer 132kV Connection would also be decommissioned.

Decommissioning

2.18 When a line is decommissioned, the poles are removed, and all components reused where possible. Foundations are extracted to a minimum depth of one metre below ground level and the ground fully reinstated to the satisfaction of the landowner.

Construction Process

2.19 The construction of overhead lines and underground cables requires additional temporary infrastructure such as access to the wood pole locations and construction compounds to store materials. All have limited maintenance requirements and are subject to well-established procedures for dismantling/ decommissioning.

2.20 The construction of the proposed grid connection will be procured by SPEN. This contract will appoint specialised contractors for specific elements of work, such as civil engineering works and overhead line construction. Each specialist contractor through the Construction Environmental Management Plan (CEMP), will be required to comply with the mitigation measures set out in the EIAR and any conditions or other restrictions placed upon the Section 37 consent.

Construction Environmental Management Plan

2.21 The Construction Environmental Management Plan (CEMP) in conjunction with SPEN's Construction, Health, Safety and Welfare requirements will control all potential environmental effects of the construction works. The CEMP controls and guides working practices during construction such as: implementation timescales; detailed design measures to safeguard sensitive habitats and species; further surveys as required before commencing works etc. The document will also incorporate NatureScot (NS), Scottish Environmental Protection Agency (SEPA), Historic Environment Scotland (HES), Forestry and Land Scotland (FLS) and other relevant guidelines by adopting current best practice in protecting the environment during the works.

2.22 Construction Method Statements will be used to describe the nature of proposed works and the protection measures being applied for specific activities in accordance with the CEMP. This will aim to ensure all activities are carried out to minimise the environmental effects.

Programme

2.23 Construction of a wood pole takes place in one single operation, i.e., the hole is dug and the pole erected within the same day depending on ground conditions and location. Angle poles can take longer due to the need for "stay wires" to stabilise the pole in the ground.

2.24 The construction programme for the Daer 132kV Connection Project will be confirmed at detailed design stage and prior to project start following the granting of statutory consents and after all necessary land purchase/ wayleave arrangements have been concluded. At this stage it is considered that construction of the proposed connection would be approximately 12-18 months.

Pre-Construction Activities

2.25 SPEN and appointed Contractors will seek to liaise further with those directly affected by the proposed development prior to commencing with works on site to ensure all effects during construction are minimised.

2.26 Prior to commencing the construction of the OHL, a precision ground survey will be carried out to determine the ground profile along the centre of the proposed line route and for 25m on either side where the ground profile slopes across the line route. This is to ensure that the locations selected for the final siting of wood poles and the relationship with each other comply with the technical limits laid down for maximum span lengths, maximum sum of adjacent spans and safety clearances to live conductors. Further consideration is also given to the detailed environmental effects as outlined in the CEMP and landowner requirements.

2.27 Where the route of the line passes over or is in close proximity to trees that could infringe safe clearance to 'live' conductors, the tree must be felled or pruned prior to construction. Any trees felled as part of the proposed development wayleave will be undertaken in adherence to the mitigation measures as listed in the CEMP.

Construction Method for an OHL

2.28 Construction of overhead lines typically follows a standard sequence of events as outlined below:

(i) Tree Felling where required

Felling will be undertaken with tracked mechanical harvesters designed to cause least ground and soil structure damage. Manual chainsaw operators will support the harvester to fell any trees that are too large or heavily branched. Once felled, timber is stacked on the ground to await extraction to the roadside.

At this early project stage, it is proposed that any mature commercial forestry (20-50 years) felled to accommodate the works shall be used for timber products. Young non-commercially viable trees (0-20 years) will be chipped, and the mulch spread to an agreed depth for the specific location.

All commercial felling operations including access tracks and protection of watercourses will be undertaken in accordance with FLS guidelines. Timber will be harvested conventionally with the resulting lop and top left and used as brash mats to provided floatation for the extraction of the timber products as per standard forestry practices to minimise ground damage. At this project stage, it is envisaged that areas felled beyond the required OHL wayleave to accommodate for example potential windthrow will be returned to the landowner and replanted in accordance with the adopted Long Term Forestry Plan unless an alternative proposal is identified during the environmental assessment process.

Other individual trees depending on the species, location and future use, shall either be felled as close to the ground as possible and treated with a suitable herbicide, or stump ground.

(ii) Construction of Temporary Construction Compounds

Temporary construction compounds will be required for the provision of site offices, welfare facilities and the storage of construction materials. The temporary compounds will be located close to the existing road network, and where services and utilities can be easily accessed. The appointed contractor in agreement with SPEN will identify these sites prior to construction. Each temporary compound will be fully restored when the grid connection has been commissioned. It is anticipated for the proposed Daer 132kV Connection Project that only one temporary construction compound will be required.

(iii) Preparation of Temporary Accesses

Wood pole OHL construction generally involves the use of a tracked excavator and low ground pressure vehicles such as tractors, argocats or quad bikes to deliver, assemble and erect each of the wood pole structures. There may be some instances where an access track may need to be formed using imported stone or temporary matting.

Where new temporary access tracks are required, the type will be determined based on the ground conditions, landuse and environmental sensitivity of the location. The three main types of access are:

- Low pressure vehicle use.
- Floating tracks.
- Wood/steel matting.

Where floating stone access tracks are used over peat, best practice guidance[4] will be followed and the risk of compaction will be minimised by:

- Using suitably graded geotextiles and geofabrics to spread loading.
- Micro siting tracks to avoid any particularly wet areas of peat.
- Using appropriate drainage techniques to maintain the natural peat hydrology.

The least disturbance to current land use and land management practices will be sought, and the use of existing tracks will be maximised with upgrading works undertaken where necessary. It may be necessary to construct temporary spurs from existing roads/tracks into each pole position. The temporary access roads will be identified by SPEN for inclusion in the EIAR and application for consent. These will later be confirmed with the appointed contractor.

[4] SNH/FC (2010) Floating Roads on Peat

The CEMP will set out the detailed criteria for identifying the types of tracks required and the appropriate installation and removal techniques for each type.

Temporary bridges may also need to be installed to provide access over watercourses for construction. For narrow burns, a mat of timbers will be used supported by steel beams. Larger watercourses will require the installation of a steel plate deck which will have safety barriers at either side supported by main support beams and steel cross members.

All watercourse crossings will be designed to comply with the Controlled Activities (Scotland) Regulations. These will adhere to the general binding rules and may, in some instance require a Licence.

Where temporary crossing of watercourses are required, it is envisaged at this stage of the project that there will be two types:

- Narrow burns- a mat of timbers supported by steel beams.
- Larger watercourses- steel plate decking bridge supported on main beams and cross members.

(iv) Temporary Working Areas including Excavation and Construction of Foundations

The likely required temporary working areas around wood pole positions is 30m x 20m. A 5m tract under the route is also required for conductor stringing. These areas will be reinstated and restored to former conditions upon completion of the construction works.

In some cases, the shape or size of the working area will be determined by nearby environmental, or land use constraints identified during the environmental assessment process prior to construction.

Wood pole foundations involve an excavation to allow the pole brace block or steel foundation brace to be positioned in place. A typical pole excavation will be 3m x 3m and 2m deep. Excavated material is sorted and used for backfilling once the pole is erected.

(v) Assembly and Erection of Poles

For wood poles, the cross-braced steelwork, insulator fittings and wood poles will be assembled local to the pole site and lifted into position by the tracked excavator, which excavated the foundations. The foundation holes will then be backfilled with the excavated material and the pole stay wire supports attached in preparation for conductor stringing.

(vi) Stringing of Conductors and Commissioning of the Line

Stringing of the poles will only commence after a sufficient number of structures have been completely erected. Temporary pulling points will be established at angle poles. These may coincide with temporary pole working areas and will generally be 30m x 20m in area.

At each pulling area, a winch will be set up at one end of the stringing area. A “tensioner” will be set up at the other end of the section. Pilot wires will be placed in blocks fitted to the top of the insulator strings and connected to both the winch and the tensioner. Using the winch, the conductor will then be drawn through the section, with the tensioner providing a constant tension. This allows the conductor to be pulled above the ground minimising damage to the conductor and the ground below.

(vii) Reinstatement

Upon completion of construction activities, the temporary working areas and construction compounds will be fully reinstated and restored to their previous condition.

Services

2.29 The proposed transmission line may cross underground pipelines and services. In these locations all requirements of the appropriate authority will be adhered to, both at the detailed design stage, when locating individual poles and ensuring minimum safety clearances are achieved, and at the construction stage by complying with relevant Codes of Practice and adopting Safe Working Procedures and Operations.

2.30 Prior to stringing the conductors, any roads, which are to be crossed by the proposed overhead line, have to be protected by building a scaffold tunnel “sky cradle” through which vehicles can safely pass.

Completion

2.31 Wood pole construction is completed with the reinstatement of ground around the poles, access routes and construction compound, all in accordance with the CEMP and as agreed with the landowner. Any surplus material will be treated in accordance with the CEMP and Site Waste Management Plan (SWMP).

2.32 The CEMP will outline the required ground and vegetation clearance measures to be implemented at the outset of the construction work. This may require for example: the existing vegetation and materials holding the seedbank (i.e. 300mm of the top of softer materials) to be stripped and carefully set aside for reuse; or whole turves set aside and stored vegetation side up for surface restoration. In all cases, topsoil and subsoil will be carefully excavated and stored separately in accordance with BS4428 and BS8601.

Construction Method for Underground Cables

2.33 Open cut trenching is the most frequently used construction method for cable installation. However, in crossing under watercourses or roads for example, a trenchless technique such as directional drilling may be used.

2.34 Works at each section commonly consist of the construction of a haul road, the excavation of the cable trench by mechanical excavators, cable laying, the backfilling of the trench with sand and backfill material, and surface reinstatement. A typical cable installation rate is up to 160m per week, depending on the terrain. A temporary construction compound is also required and again this is generally located close to the midpoint of the cable route.

2.35 Annual maintenance checks on foot are commonly required during operation. Except for low growing vegetation the cable route will also be kept clear. In the unlikely event that there is a fault along the cable, the area round the fault will be excavated and the fault repaired, or a new section of cable inserted as a replacement. If lines are decommissioned, cables can either be left in situ, or carefully excavated and removed.

Waste

2.36 As part of the CEMP a Site Waste Management Plan (SWP) will be prepared for the proposed development, which will detail the requirements for management of any waste in accordance with statutory and licencing requirements, accepted good practice and to ensure that wherever possible materials are reused, recycled, or recovered in preference to disposal. Any waste emanating from the construction works will be collected in predetermined areas on site and transferred to a licenced site by a registered waste carrier in accordance with the SWP.

2.37 At this project stage likely waste streams are considered to be as follows:

- Toilet facilities.
- Municipal type wastes.
- Subsoil/ stone from wood pole excavations.

Micro- Siting & Infrastructure Location Allowance

2.38 The proposed Daer 132kV Connection Project development footprint will continue to be developed and detailed through technical, engineering, and environmental review as an integral part of the design and environmental assessment process. Even after consent the final vertical and horizontal profile of conductors, pole positions and access track routes may require to be refined to reflect the following:

- Pre-construction confirmation of dynamic environmental conditions e.g. the location of protected species.
- Detailed technical survey information, particularly for unconfirmed ground conditions.
- Provide further scope for the effective mitigation of any likely environmental impacts.
- Minor alterations requested by landowners.

2.39 To ensure that the final positions of the OHL poles, associated temporary and permanent infrastructure are not varied to such a degree as to cause an increase in environmental impacts, an Infrastructure Location Allowance (ILA) is proposed. This will permit the siting of a pole to be adjusted within 50m tolerance either side of the proposed OHL and temporary access routes. It is proposed that the ILA forms part of the Section 37 application and as a condition attached to consent.

2.40 Implementation of the ILA will be controlled through the proposed CEMP. Should a request to vary a pole or access track position within the ILA be raised, the relevant environmental baseline surveys undertaken to inform the CEMP will be reviewed in the first instance as these surveys extend beyond the proposed 50m ILA tolerance. Should this review identify any potential issues, further environmental advice will then be sought from the appropriate specialists. A procedure for notifying relevant statutory consultees of proposed ILA movements will also be agreed with these bodies prior to construction commencing.

Component parts of 132kV 'Trident' design wood pole: Intermediate (H pole)

Component parts of 132kV 'Trident' design wood pole: Angle (H pole)

Component parts of 132kV 'Trident' design wood pole: Terminal (H pole)

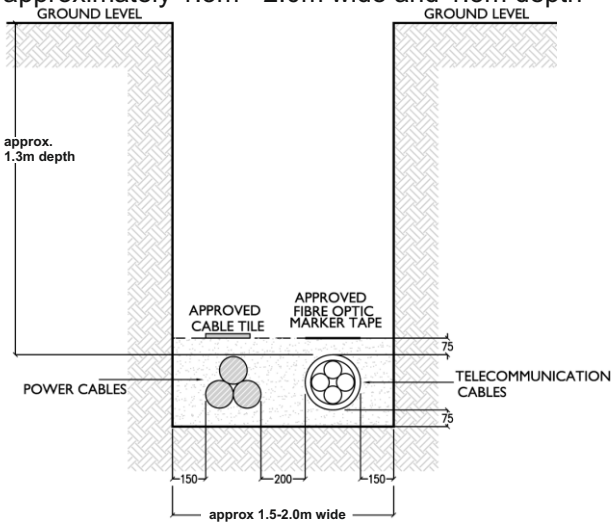
Intermediate 'H' Pole

Angle 'H' Pole

Terminal 'H' Pole

Typical Single Circuit 132kV Underground Cable Trench Detail

approximately 1.5m - 2.0m wide and 1.3m depth



Rev 14-3-24_Photographs corrected to indicate the proposed double wood pole design for the Daer 132kV Grid Connection. Diagram updated.

figure 2.1

Title:

132kV Wood Pole Overhead Line Design & Underground Cable

Project:

Proposed 132kV Connection to Daer Wind Farm

Scale: na

Date: Jan 2024

SP EnergyNetworks

Environmental Designworks

Landscape Architecture + Planning

SPEN's Overall Approach

3.1 SPEN has a legal duty to develop and maintain a technically feasible and economically viable transmission and distribution system. The routeing of a grid connection is a complex process, requiring a balance to be struck between statutory obligations, engineering requirements, economic viability, the environment, and people.

3.2 The Government, Ofgem and the electricity industry, including SPEN, have reviewed their positions on grid connections and remain of the view that the need to balance economic, technical, and environmental factors, as a result of statutory duties and licence obligations, continues to support an overhead line approach in most cases. SPEN's view is therefore that, wherever practical, an overhead line approach is taken when planning and designing new grid connections. However, SPEN accepts that there are specific circumstances in which an undergrounding approach should be considered.

3.3 SPEN has published an updated summary document outlining the approach taken to the complex process of routeing transmission infrastructure (Routeing and Environmental Impact Assessment, SPEN 2020). This document is available at: https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf

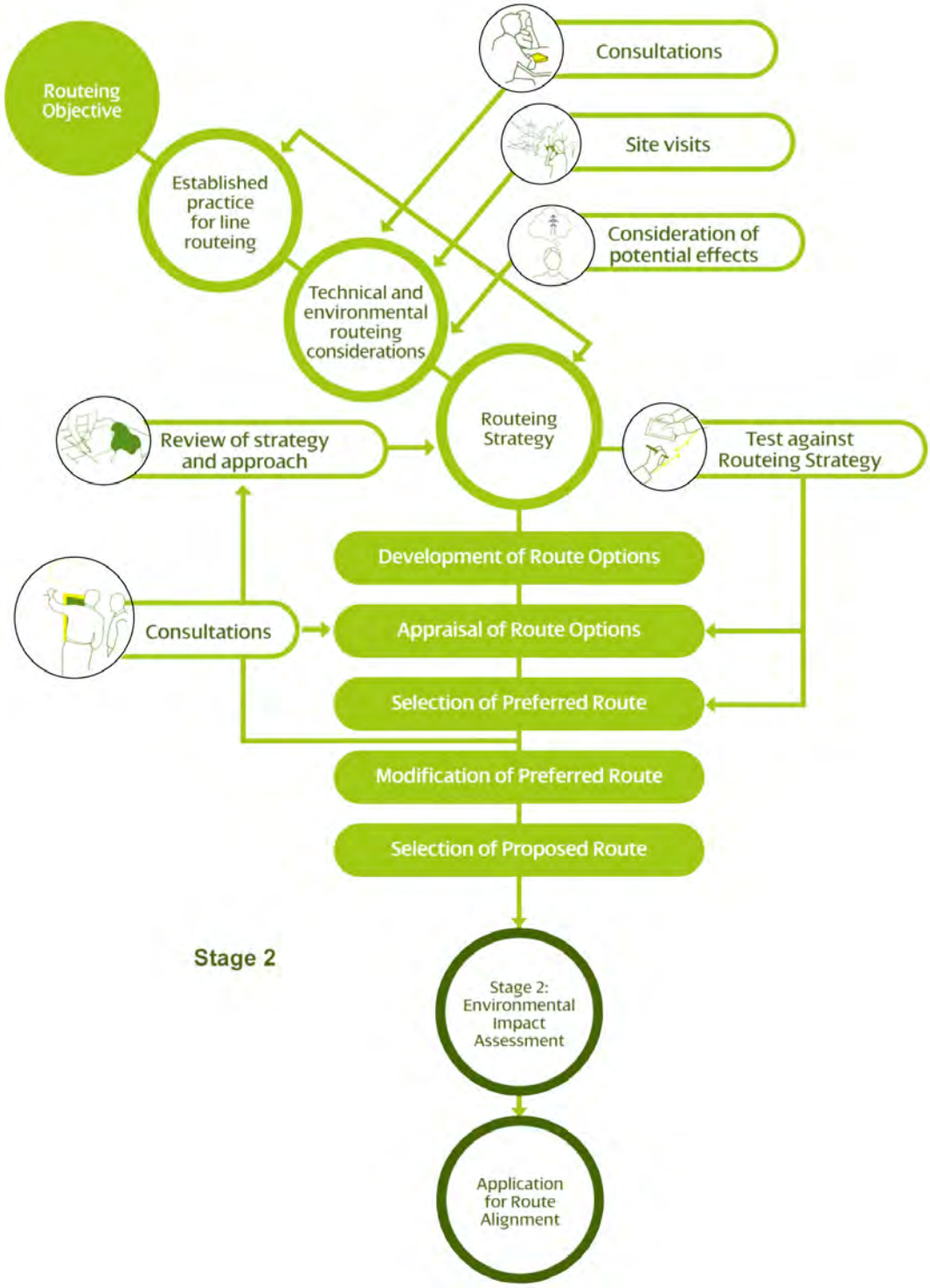
3.4 This builds on the previous Approach to Routeing document published in 2015 consolidating guidance as outlined in the Holford Rules, Forestry Guidelines, Horlock Rules and best practice (Marshall and Baxter, 2002). One key addition is the consideration of Biodiversity Net Gain (BNG) and how SPEN will seek to integrate this into the routeing, EIA, and project delivery stages to ensure that all projects contribute to targets for biodiversity enhancement.

3.5 In summary, every project follows a well-established and sequential step by step process to identify a technically feasible and economically viable route, which on balance causes the least disturbance to people and the environment.

3.6 The routeing process is summarised in the diagram as extracted from the Routeing and EIA Process (SPEN 2020) as indicated in **Table 1** below.

Table 1: Routeing and Environmental Impact Assessment Process

Stage 1



Routeing Objective for the Daer 132kV Connection Project

3.7 In accordance with SPEN's approach to routeing, the routeing objective for the Daer 132kV Connection Project is:

"To identify a technically feasible and economically viable route for a continuous 132kV grid connection from the proposed Daer Wind Farm development, to the existing substation at Moffat. This route should, on balance, cause the least disturbance to the environment and the people who live, work and enjoy recreation within it".

Approach to Routeing

3.8 SPEN's overall approach is based on the premise that the principal way of mitigating environmental effect is by the selection of the most appropriate route. This approach reflects the fact that one of the main effects of an overhead line (OHL) is visual, as a result of its scale relative to objects in the vicinity such as buildings and trees. As there is no technical way of reducing this other than choice of support (tower and poles), and only limited ways of achieving screening through planting, the most effective way of causing the least visual disturbance is therefore by careful routeing. However, the importance of other likely environmental considerations, including matters such as biodiversity, are also recognised to have a significant role in this process. On that basis, it is acknowledged that a well routed OHL takes account of other environmental and technical considerations, even if the length is increased as a consequence.

3.9 Integral to the routeing approach is the fact that the route selection process must be objective and comprehensive to the ultimate decision-making authority and those stakeholders whose interests are affected by the proposed development. In seeking to achieve "least disturbance", key stakeholders including local communities and others who may have an interest in the project are actively consulted. This consultation process begins at an early project stage to ensure that the project design balances the views of stakeholders and communities, with the statutory obligations of a transmission licence holder.

3.10 The approach is an iterative, systematic evaluation of route alternatives based on established practice and guidelines, with professional judgement used to establish explicitly the balance between technical, economic viability and environmental factors. Consultation and technical review is an integral part of the routeing strategy process. This enables assumptions to be confirmed and ensures confidence in the findings, prior to the commencement of subsequent steps.

Established Practice and Guidelines

<u>The Holford Rules</u>

3.11 It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing overhead lines, "The Holford Rules", should continue to be employed as the basis for routeing high voltage overhead lines. Key principles of the Holford Rules as outlined below include avoiding prominent ridges and skylines, following broad wooded valleys, avoiding settlements and residential properties, and maximising opportunities for "back clothing" infrastructure.

Rule 1: Avoid altogether, if possible, the major areas of highest amenity value[5], by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

Rule 2: Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures which are used when lines change direction.

Rule 3: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers.

Rule 4: Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

Rule 5: Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees.

Rule 6: In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or 'wirescape'.

Rule 7: Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.

3.12 The Holford Rules were reviewed around 1992 by the National Grid Company (NGC) PLC (now National Grid Transmission PLC (NGT)), as owner and operator of the electricity transmission network in England and Wales, with notes of clarification added to update the Rules. A subsequent review of the Holford Rules (and NGC clarification notes) was undertaken by Scottish Hydro Electric Transmission Limited (SHETL) in 2003 to reflect circumstances in Scotland. The Holford Rules and NGC and SHETL clarification notes have been placed in **Appendix 1.**

Forestry and Land Scotland Guidance

3.13 Guidelines have also been produced by Forestry and Land Scotland (FLS) for the routeing of overhead lines through forest areas[6]. In summary, these guidelines state that overhead lines should be routed to follow open space and to run alongside, not through, woodland. Where there is no alternative route; an overhead line through a forested area should:

- avoid areas of landscape sensitivity;
- avoid the line of sight of important views;

[5] SHETL clarification note states areas of highest amenity value "require to be established on a project - by - project basis considering Schedule 9 of the Electricity Act, 1989". The term is now often interpreted as "environmental" value to reflect wider intrinsic value.

[6] Forestry Commission (1994) Forest Landscape Design Guidelines.

- be kept in valleys and depressions;
- not divide a hill into two similar parts where it crosses over a summit;
- cross skyline or ridges where they drop to a low point;
- follow alignments diagonal to the contour as far as possible;
- be inflected upwards in hollows and downwards on ridges.

3.14 With respect to the design of the overhead line corridor, within the forest, the overhead line should seem to pass through a series of irregular spaces. The forest should appear to meet across the open space in some places so that the corridor does not split the forest completely. Where appropriate, and in line with relevant electrical and forest management safety guidance, careful consideration should also be given to the management of woodland edges for biodiversity and wildlife e.g. wildlife bridges[7].

3.15 The UK Forestry Standard (UKFS) was published in 2017 and provides the national reference standard for managing forests in the UK to meet current needs without hindering future generations requirements. The UKFS sets guidelines for sustainable forest management and recognises Scotlands forests have a range of environmental, economic and social objectives.

3.16 The Scottish Government is committed to maintaining and increasing Scotland's woodland cover and has developed supporting policy guidance[8] to strictly control removal and where felled, the requirement for compensatory replanting. In summary woodland removal should be kept to the minimum and only where it would achieve significant and clearly defined public benefits. This approach is consistent with the sustainable forest management approach as outlined in the UKFS.

Overview of Routeing Process

Study Area

3.17 A Study Area is first defined, which is large enough to accommodate all likely route options, taking account of the technical requirements (i.e. connection points) and factors such as topography. Baseline data collation and mapping of the routeing considerations outlined below then enables routeing constraints and opportunities to be identified.

Environmental Considerations

3.18 As noted statutory duties imposed on SPEN by Schedule 9 of the Electricity Act 1989 state that Licence Holders:

"(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archeological interest; and

[7] Forestry Commission (2014) Design Techniques for Forest Management Planning: Practice Guidance

[8] Forest Land Scotland (2019) Control of Woodland Removal Policy

(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

3.19 As noted SPEN's approach to route selection is based on the premise that the major effect of an overhead transmission line is visual and that the degree of visual intrusion can be reduced by careful routeing. This can be achieved by routeing the line to fit the topography, by using topography and trees to provide screening and/or background, and by routeing the line at a distance from settlements and roads.

3.20 However, the importance of other environmental issues also play a significant role in this process. Such environmental considerations include potential effects on (in no hierarchical order): visual amenity; landscape character; ecology and ornithology; forestry and woodland; hydrology; hydrogeology; geology (e.g carbon rich soils and deep peat); water resources; cultural heritage; landuse (e.g commercial forestry, mining operations, national pipeline routes); recreation and tourism. In addition to permanent effects, the construction and operational effects also need to be considered.

3.21 Potential visual and physical effects relate primarily to the structure carrying the transmission lines. The structure and conductors may be visible from properties, roads, tourist attractions and other important locations, and may alter the character of the landscape. Physical effects relate primarily to the proposed structure such as the ground area occupied, underground disturbance of features to construct the required foundations and possible requirement for temporary access tracks during construction. Transmission line conductors require specific safety clearances and may, for example, necessitate the removal of trees. The location and siting of the structure and conductors may also have an effect on bird movement.

3.22 Some effects can be avoided or limited through careful routeing. Other effects are best mitigated through local deviations of the route, the refining and micro siting of pole locations and/ or specific construction practices. These are reviewed as part of the EIA process.

Technical and Economic Considerations

3.23 Technical considerations which can influence routeing include:

- Minimising the length of the OHL;
- Existing and proposed electricity transmission network;
- Access requirements for construction and future maintenance;
- Avoidance of sharp angles of deviation.
- Avoidance of steep terrain and slopes >15° which can impact on the technical feasibility of actual construction of the wood pole line.
- Avoidance of areas higher than 500m AOD. In Scotland, altitude above 200m is considered an extreme environment in technical design terms due to the high wind and ice loadings.
- Avoidance of unfavourable ground conditions from a geotechnical point of view for example, areas of deep peat and contaminated ground.

- Maintain required clearances and consideration of future maintenance requirements. For example, waterbodies and watercourses used for fishing; wind turbine rotor blades (falling distance and wake effect clearances); and national pipelines (safety clearances).

3.24 In compliance with Section 9 of the Electricity Act 1989, the Routeing Objective requires the proposed solution to be "economically viable". This is interpreted by SPT as meaning that as far as is reasonably possible, and other things being equal, the line should be as direct as possible and the route should avoid areas where technical difficulty or compensatory requirements would render the scheme unviable on economic grounds.

Routeing Process Summary

3.25 The routeing methodology is made up of sequential steps, which inform the next step. Throughout the process is informed by the preceding steps of the Routeing Objective and Routeing Strategy with reference to: established practice for line routeing; technical and environmental considerations.

3.26 In summary the steps in the routeing process consist of:

1. Identification of the Study Area and Routeing Constraints

The review of technical and environmental constraints and opportunities for the Study Area, with reference to the route objective and established practice, allows potential effects to be identified and the development of a routeing strategy. This provides clarity on how the proposed connection will be achieved for the specific project location.

This approach establishes considerations that are used to identify broad corridors (routeing issues) and those which are used to modify routes (deviation issues). Routeing issues are generally strategic and extensive in area, whilst deviation issues tend to be of local importance and smaller in scale.

2. Identification of Route Options

Based on the routeing strategy, a number of route options are then developed and the effect on the routeing considerations recorded.

3. Appraisal of Route Options

At the evaluation stage a route option may be rejected, modified or studied in more detail. The objective of this process being the identification of a Preferred Route, which has the least likely adverse environmental effects, whilst being technically feasible and economically viable.

4. Selection of a Preferred Route

After the comparative evaluation of route options, an emerging preferred option (on environmental grounds) is subjected to a further technical checking prior to confirming the Preferred Route. This Routeing and Consultation Document aims to provide an objective and transparent understanding of the routeing strategy process to date to identify the Preferred route.

5. Consultation

The Preferred Route is the option considered to be the most technically feasible and economically viable, whilst causing the least disturbance to the environment and to people.

Following consultation on this Preferred Route, any comments raised will be considered to inform the identification of a “Proposed Route”. The stages following the review of feedback from the consultation stage are set out in **Chapter 7.0: Way Forward.**

The Project Routeing Strategy

4.1 The routeing strategy, which has informed the identification and appraisal of the Daer 132kV Connection Project route options is:

"Route options will take account of the landscape character and make careful use of the topography whilst avoiding areas of highest amenity value and sensitivity as far as possible. The elevation, topography, major landuse of the Study Area of commercial forestry with scattered isolated residential properties and heritage sites, and the proposed Rivox Wind Energy Hub development has required careful consideration".

Study Area

4.2 The first step in the routeing process involved identification of the Study Area, to establish and define an area of search for route options and the gathering of environmental baseline data. In identifying the Study Area, it was important to ensure this was large enough to accommodate all likely route options reflecting the Routeing Objective and Routeing Strategy.

4.3 In this area the topography largely defines corridors within which it would be feasible to route an overhead line between the proposed Daer Wind Farm Substation and the existing substation at Moffat. A preliminary check was also carried out to identify the presence of International, European, or Nationally Designated areas within or immediately adjacent to, the Study Area, to ensure that potential effects on these areas could be considered from the outset.

4.4 Taking account of the above, a wider area encompassing the potential route options was identified extending approximately 5km to either side to form the boundary of the Study Area. The base mapping extent of the Study Area is shown in **Figure 4.1**.

Environmental Baseline

4.5 Information regarding the environmental features and sensitivities of the proposed Study Area at this initial stage of the Project is presented below and in the accompanying **Figures 4.1- 4.8** (placed at the end of this **Chapter**).

4.6 The information for these Figures and provided in this Chapter was collected from published documents and site visits. In detail, the following has been undertaken: -

- Desk study of aerial photographs and historic maps.
- Desk review of current environmental and planning data, designations, Local Development Plans and Policies.
- Site appraisal of environmental resources and potential receptors within the Study Area.[9]
- Reference to the Landscape Character Types[10] as collated by Nature Scot.
- Information available from: Local Development Plans covering the Study Area, Historic Environment Scotland website, British Geological Survey website, Scotland's Soils website, Scotland's Environment website, the Coal Authority website, the Scottish Government website, the DEFRA MAGIC website, Nature Scot Website and SEPA website.

[9] From publicly accessible locations only.

[10] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions.

4.7 Information has also been obtained from the Environmental Impact Assessment Reports prepared for the proposed Daer Wind Farm (Natural Power, 2021) and Rivox Wind Energy Hub (LUC, 2023).

Planning Policy Context

National Planning Policy

4.8 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 introduced a target of net zero greenhouse gas emissions by 2045. Scotland's Climate Change Plan 2018- 2032 Third Report sets out the road map for achieving reduced emission targets and has set the goal of 75% of Scotland's energy need to be met by renewable energy by 2030. To deliver an energy system that meets this challenge the Scottish Government has recently published a Draft Energy Strategy and Just Transition Plan (2023). This notes support for the "timely delivery of required electricity network infrastructure"[11].

4.9 The National Planning Framework 4 (NPF4) adopted in 2023 places climate and nature at the centre the planning system with clear support for all forms of renewable, low carbon and zero emission technologies, including transmission and distribution infrastructure. NPF4 sets out the policies and proposals for the development and use of land and provides a long term spatial strategy to 2045.

4.10 Significant developments of national importance will deliver the spatial strategy. Eighteen national developments support the NPF4 strategy and include with reference to the delivery of sustainable places, "strategic renewable electricity generation and transmission infrastructure"[12]. National development (No 3) supports "electricity generation and associated grid infrastructure throughout Scotland, providing employment and opportunities for community benefit, helping to reduce emissions and improve security of supply"[13]. New high voltage grid connections of 132kV or more, and associated infrastructure such as substations are noted within the context of NPF4 to be national development.

4.11 With reference to Energy, Policy 11 aims to encourage, promote, and facilitate all forms of renewable energy both onshore and offshore. All renewable development proposals will be supported, and it is noted this includes "enabling works, such as grid transmission and distribution infrastructure"[14]. Environmental impacts of such developments are to be addressed in the project design and mitigation. It is noted that in the consideration of impacts "significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets"[15]. With specific reference to grid infrastructure proposals, it is noted that "consideration should be given to underground connections where possible"[16].

[11] Scottish Government (2023) Draft Energy Strategy and Just Transition Plan. P126

[12] Scottish Government (2023) National Planning Framework 4. p 7

[13] Scottish Government (2023) National Planning Framework 4. p 7

[14] Scottish Government (2023) National Planning Framework 4. p 53

[15] Scottish Government (2023) National Planning Framework 4. p 54

[16] Scottish Government (2023) National Planning Framework 4. p 54

4.12 With reference to the environment and biodiversity, NPF4 notes that "development proposals for national, major or EIA development will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention"[17].This planning aim for biodiversity is embodied in Policy 3.

4.13 Protection of carbon rich soils, peatland restoration and the requirement to minimise disturbance to soils by development is covered by Policy 5. This notes that development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported in a few specific circumstances including "Essential infrastructure and there is a specific locational need and no other suitable site".[18]

4.14 Policy 6 aims to protect and expand forestry, woodland, and trees. In particular, it is noted that development proposals will not be supported where there is "any loss of ancient woodlands" or "adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value".[19] Proposed development which requires woodland to be removed will only be supported where this "will achieve significant and clearly defined additional public benefits" and "compensatory planting will most likely be expected to be delivered".[20]

4.15 The protection and enhancement of historic environment assets and places is afforded by Policy 7. This aim encompasses non designated historic sites and their setting, and wherever possible should be protected in situ. It is noted that where there is potential for non designated buried archaeological remains to exist, developers should "provide an evaluation of the archaeological resource at an early stage so that planning authorities can assess impacts".[21]

Local and Strategic Planning Policy

4.16 The following Local Development Plans (LDPs) cover the Study Area: -

- Dumfries and Galloway LDP 2019
- South Lanarkshire LDP2 2021[22]
- Glasgow and Clyde Valley Strategic Development Plan 2017

4.17 The Dumfries and Galloway LDP2 was adopted in October 2019 and provides the planning framework and guides the future use and development of land in towns, villages, and the rural area. The overarching principle of this Plan "is that all development proposals should support sustainable development, including the reduction of carbon and other greenhouse gas emissions"[23].

4.18 The South Lanarkshire LDP2 (2021) overall strategic vision is encompassed in Volume 1 by Policy 1 Spatial Strategy which states "The spatial strategy of LDP2 will encourage sustainable

[17] Scottish Government (2023) National Planning Framework 4. p 9

[18] Scottish Government (2023) National Planning Framework 4. p 42

[19] Scottish Government (2023) National Planning Framework 4. p 44

[20] Scottish Government (2023) National Planning Framework 4. p 44

[21] Scottish Government (2023) National Planning Framework 4. p 46

[22] South Lanarkshire Council (2021) SLLDP2

[23] Dumfries and Galloway Council (2019) LDP 2 Para 1.11 p10.

economic growth and regeneration, move towards a low carbon economy, protect the natural and historic environment and mitigate against the impacts of climate change".[24]

4.19 South Lanarkshire is one of eight local authorities that form the Clydeplan Strategic Development Planning Authority (SDPA). The second Strategic Development Plan (SDP) was approved in July 2017 and aims to support economic competitiveness and social cohesion whilst acknowledging the need to adopt a sustainable environmental approach. Clydeplan SDP 2017 supports the transition to a low carbon economy (Policy 10).

4.20 The Planning (Scotland) Act 2019 removed the statutory requirement to prepare a SDP and replaced it with a duty to prepare a Regional Spatial Strategy (RSS). The most current Clydeplan SDP remains in force until both NPF4 and the RSS are adopted.

Key Landscape Features of the Study Area

Landform

4.21 An elevated range of undulating rounded hills defines a series of narrow valleys, collectively named the Lowther Hills. This range forms part of the Southern Uplands, with interlocking hill tops at around 450-500m AOD. A notable high point in the Study Area is the distinctive conical hill of Queensberry at 697m AOD to the west of Beattock.

4.22 This range of hills divides the watersheds of the River Clyde and Evan Water. To the west the Daer Water flows northwards to join the River Clyde, and to the east the Evan Water flows south to join the River Annan.

Landcover

4.23 The landcover of the Study Area uplands is distinctly divided with extensive rough grassland and moorland to the west and coniferous plantation to the east. This commercial woodland managed by Forestry Land Scotland (FLS) is known as Rivox and to the south joins the Forest of Ae.

4.24 The rolling elevated foothills containing the valleys comprise of rough grazing and fields of improved and semi improved pasture, bounded predominantly by stonewalls. There are scattered blocks and shelterbelts of coniferous plantation and areas of mixed woodland primarily associated with the isolated farmhouses such as Cauldholm, Newbank, Craigielandshill and Lawesknowe. Larger areas of woodland along the western slopes of the Evan Water and Annandale valley form part of the estates of Craigielands, Auchencastle and Marchbankwood. Other notable areas of mature broadleaved woodland are located on hill sides such as at Stidrigg Wood to the south west of Cauldholm and along the Garpol Glen to the south of Auchencastle.

4.25 The landcover of the Annandale valley floor is mainly improved and semi improved pasture, bounded by hedgerows, stone walls, and post and wire fences. Along the valley are scattered areas of deciduous or mixed woodland often associated with areas of higher ground and larger properties, and along the watercourses. Bankend Wood to the north west of Moffat Substation is a Long Established Woodland of Plantation Origin.

[24] SLLDP Vol 1 (2021) p 11

Landuse

4.26 The landuse of the Study Area is largely determined by the topography and elevation. The higher ground is primarily open rough grazing and large scale commercial forestry plantations. To the north and south are the wind farms of Clyde South, Harestanes and Minnygap. There are a few isolated farmhouses in this area such as Kinnelhead, Blairmack and Rivox.

4.27 The lower foothills are primarily used for sheep grazing. There are more scattered isolated farmhouses and residential properties located along the sheltered valleys. On the eastern edge of the foothills is a hotel at Auchencastle and to the south a caravan park at Craigielands.

4.28 The Annandale valley floor is primarily agricultural land with sheep and cattle grazing. The settlements of Beattock and Moffat, and scattered residential properties and farmsteads are located in this lower sheltered area. Moffat historically developed as a spa resort in Victorian times and is still a very important tourist destination. The M74, B7076 and West Coast Railway Line all pass along the valley floor in a north - south direction.

Landscape Designations **(Figure 4.1)**

4.29 No international or national landscape designations are located within the Study Area.

4.30 The following regional landscape designations are in the Study Area as indicated in **Figure 4.1**.

- Leadhills and Lowther Hills Special Landscape Area (SLA)- South Lanarkshire
- Thornhill Uplands Regional Scenic Area (RSA)- Dumfries and Galloway
- Moffat Hills Regional Scenic Area (RSA)- Dumfries and Galloway

4.31 The noted landscape qualities or key characteristics of these areas are summarised as follows:

Leadhills and Lowther SLA

- An extensive area of high, smooth, rolling hills and varied upland glens with a sense of emptiness engendered by a lack of extensive forestry or windfarm development;
- Cultural features include the mining heritage surrounding Leadhills and remains of settlements on the sides of glens;
- Extensive areas of rough grassland and heather moorland vegetation;
- The Southern Upland Way and other walking routes accessible via the M74/A74(M) and main roads passing through the west; visitor attractions at Leadhills and fishing on the Daer reservoir.

Thornhill Uplands RSA

- Area centred around the Middle and Upper Dales of the River Nith and the series of upland glens formed by its tributaries;
- Varied and contrasting upland and valley scenery ranging from exposed remote summits of the Lowther Hills to the wooded gorge of the Nith above Drumlanrig to the pastoral character of the wide enclosed upper valleys;
- Accessible main valleys, relatively high population and managed landscape. Popular area for informal recreation; and
- Forestry and wind farm pressures.

Moffat Hills RSA

- Large, smooth dome/ conical shaped hills, predominantly grass covered;
- Open and exposed character except within incised valleys;

- Distinctive dark brown/ purple colour of heather on some of the higher areas
- Pockets of woodland in incised valleys;
- Stone dykes occasionally define the lower limit;
- The legacy of lead and other mining activity

4.32 The Inventory of Gardens and Designed Landscapes managed by Historic Environment Scotland (HES) includes private gardens, parks, country estates and botanical gardens. Inclusion within the inventory means that it receives recognition and a degree of protection through the planning system.

4.33 One inventory garden and designed landscape at Raehills is located in the Study Area. This Category A Listed Building together with surrounding parkland and woodland are described as a beautiful landscape composition with rich historical associations with the Earls of Hopetoun and Annandale.

4.34 Scotland's Garden and Landscape Heritage (SGLH) supported by Councils and NatureScot has also produced a list of Non-Inventory Sites of Regional and Local significance. Four of such gardens have been identified within the Study Area at: Auchencastle; Craigielands; Dumcrieff; and Lochwood.

4.35 To the east of Moffat Substation is the Southern Uplands Environmentally Sensitive Area. This extensive area has been designated for the purpose of conserving, protecting and enhancing environmental features of the area by the maintenance or adoption of agricultural methods.

Landscape Character Assessment **(Figure 4.2)**

4.36 NatureScot (NS) (formerly Scottish Natural Heritage (SNH)) undertook a series of Regional Landscape Character Assessments (LCAs) following established guidance[25] covering the whole of Scotland in the 1990s. Building on the original Landscape Character Assessment studies, this information has now been updated by NatureScot at the level of Landscape Character Type (LCT) to create a single dataset[26] for the review of development proposals, plans and strategies. LCTs are "areas of consistent and recognisable landscape character"[27].

4.37 The different LCTs in the Study Area are listed below and illustrated in **Figure 4.2**.

- Foothills
- Foothills with Forest
- Middle Dale
- Southern Uplands
- Upland Fringe
- Upland Glen

4.38 The proposed Daer Wind Farm is located within the Southern Uplands LCT in South Lanarkshire (217) and Dumfries and Galloway (177). This LCT in South Lanarkshire is characterised as follows:-

[25] Landuse Consultants (1991) Landscape Assessment Principles and Practice & Countryside Commission (1993) Landscape Assessment Guidance (CCP423).

[26] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions.

[27] https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland

- "Extensive, large- scale upland landscape with strong but smooth relief;
- Glacial carved and smoothed landforms, including U shaped valleys, hanging valleys and corries;
- Extensive mosaics of heath, with a transition to rough grazing on lower tops or slopes;
- Prominent isolated coniferous plantations and old stands of Scots Pine;
- Largely undeveloped except for occasional upland farms, sheillings, and occasional masts of Clyde Wind Farm;
- Important travel and transmission lines pass through the area are the A74, west coast mainline railway and Scotland- England interconnector pylon line;
- Significant archaeological sites;
- Prominent hill ranges in views from many areas;
- Wide ranging panoramic views from the hill summits"[28]

4.39 The dramatic sculpted landform of this LCT and scale is noted to be awe inspiring and valued by walkers and with a "strong wild character".[29] These qualities are reflected in the designation and protection of the area as a Regional Scenic Area and Special Landscape Area.

4.40 To the east is the Foothills with Forest LCT (172) descending to the Foothills LCT(175). The existing Moffat Substation is located within the Middle Dale LCT (163) which encompasses the settlement of Moffat. The key characteristics of each of these Landscape Character Types as extracted from the NatureScot dataset 2019 has been placed below.

Foothills with Forest LCT (172)

- Dark green blanket of forest covering undulating foothills.
- Changing landscape with areas with large and medium scale forestry operations and wind farm development.
- Forested areas dominated by Sitka Spruce, interspersed with mixed conifers and broadleaf planting, undergoing felling and replanting in large coupes.
- Tall mature conifers at roadside.
- Areas of more complex, locally distinctive and smaller scale landscapes, with semi- improved pasture with walled enclosures on open ground, occasional lochs and estate policies, distinctive ridges and landmark summits.
- Areas of relict landscape with remains of pre improvement settlement and agriculture clustered in burn valleys.
- Wind farms, locally defining the character in some areas of central Dumfries and Galloway.

Foothills LCT (175)

- Generally undulating land between 170-250 metres, with rounded peaks. Higher in the west, up to nearly 550 metres with craggier peaks.
- Foothills dissected by incised valleys.
- Semi improved pasture enclosed in medium scale fields by stone walls. Grazed by sheep and cattle. Some rough pastures and heath on higher ground.
- Trees in sheltered pockets with some copses on top of hills.
- Many scattered farmsteads and small settlements.
- Network of minor roads.

[28] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions, LCT 217.

[29] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions, LCT 177.

- Numerous archaeological sites particularly Bronze Age funery and ritual sites and Iron Age settlements and forts.

Middle Dale LCT (163)

- Broad valley with complex undulating topography and locally narrow sections.
- River meanders eroding bluffs in the valley moraines.
- Landcover predominantly improved pastures, lush green, sheep and cattle grazed.
- Medium scale field enclosures, a mixture of hedgerows and dry stone dykes.
- Extensive pattern of shelterbelts and farm woodlands with semi natural woodlands on bluff slopes.
- Dale contained by uplands with forests and rough grazing on horizons.
- Semi natural hanging woodlands on bluff slopes.
- Country houses and designed landscapes
- Settlements of high townscape quality.
- Communication routes.
- "Red earth" qualities relating to underlying red sandstones.

4.41 With reference to perception of the Foothills and Forest LCT, it is noted that "although the dense conifer forest of these areas gives a strongly unified landscape character, the scale and context of these areas is quite variable".[30] Reference to the direct and indirect impact of wind farm development to the Foothills LCT within the Annandale area is acknowledged and that "undeveloped ground in this area provides important separation between individual wind farms and emerging clusters of development"[31]. The perception of the Middledale LCT is summarised as having "a settled and comfortable character generated by their lush pastures, diversity of textures and quality of buildings"[32].

Key Visual Qualities of the Study Area

Visual Spaces

4.42 In summary the main visual spaces of the Study Area are:

- the valley corridors of the Evan Water and Annandale where views are confined;
- within the rolling foothills flanking the valleys where views are contained to the immediate surroundings due to the undulating topography and scattered woodland;
- the extensive coniferous plantation area where the views are determined by height of adjacent trees, firebreaks and areas of open ground within the plantation.
- the open uplands where views area extensive and panoramic from hill tops.

4.43 In addition to stationary vantage points, transient views are also afforded of the Study Area: from roads, the M74, A701, B7076; and network of footpaths which includes the long distance routes of the Southern Upland Way, Annandale Way, Romans and Reivers Route, and numerous cycle routes.

Visual Receptors

4.44 The main visual receptors located in the Study Area are: residential encompassing the settlements of Beattock, Moffat and scattered properties and farmsteads; recreational including

[30] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions, LCT 172.

[31] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions, LCT 175.

[32] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions, LCT 163.

visitors primarily to the towns, Auchencastle Hotel, Craigielands Caravan Park and attractions in the area such as Earshaig Lochans Nature Reserve; users of the public footpaths and cycle paths, fishing on Daer Reservoir and rivers; and travellers using the roads passing through the Study Area.

Protected Areas and Features (Figures 4.3- 4.8)

Nature Conservation **(Figure 4.3)**

4.43 No designated areas of European importance are present within the Study Area. The following designated areas of national importance are located within the Study Area:

- Shiel Dod SSSI, the nearest part of which is located approximately 3.4 km to the west of the proposed Daer Wind Farm Substation;

- Lochwood SSSI, the nearest part of which is located approximately 4.4 km to the south-west of the existing Moffat Substation.

4.44 Shiel Dod SSSI supports an assemblage of upland vegetation communities representative of the Southern Uplands. The upland assemblage includes blanket bog, subalpine dry dwarf-shrub heath, and calcareous types of spring-head, rill and flush. On Shiel Dod itself, the blanket bog is notable for the occurrence of extensive areas of cloudberry Rubus chamaemorus. Above 450 metres the vegetation displays montane affinities.

4.45 Lockwood SSSI is an area of old parkland oakwood with many ancient oaks, the oldest being mainly hollow pollards. On lower ground to the north, the oakwood grades into birch-willow-alder carr. In addition to interesting mosses and liverworts, the site is also of considerable importance for invertebrates.

4.46 There are no designated nature reserves and country parks located within the Study Area. A local nature reserve is located at Earshaig Lochans managed by Forestry Land Scotland in conjunction with Dumfries and Galloway Council.

Bird Interest Summary

Proposed Daer Wind Farm Survey Data

4.47 Extensive bird surveys have been carried out for the proposed Daer Wind Farm EIAR (Natural Power, 2021). Bird surveys covered the proposed wind farm site, which is on open moorland to the north of Whiteside Hill (Ordnance Survey Grid Reference NS 98820469). Surveys were carried out during the period 2018-2020.

4.48 Bird surveys covered the breeding period and the non-breeding period. The ornithological receptors listed below were identified, and these were subject to full impact assessment.

4.49 Vantage point surveys carried out in the breeding season during 2018 and 2019 recorded seventeen key species. Of these the most frequently recorded species were: curlew, oystercatcher, red kite, hen harrier, lapwing and greylag goose. Similar results were obtained in both survey years.

4.50 Vantage point surveys carried out in the non-breeding season during 2018 to 2019 recorded eleven key species. Of these the most frequently recorded species were: pink-footed goose, red kite and peregrine.

4.51 Raptor surveys carried out during 2018 and 2019 did not identify any occupied nests. Species recorded were: barn owl, red kite, peregrine, merlin and goshawk.

4.52 Lekking black grouse were recorded within / near the proposed Daer Wind Farm site.

4.53 The surveys carried out in 2018, 2019 and 2020 did not include the proposed Daer Wind Farm Access Route.

Proposed Rivox Wind Energy Hub Survey Data

4.54 Extensive bird surveys have been carried out for the proposed Rivox Wind Energy Hub (LUC, 2022). Non-breeding season bird surveys commenced in September 2021 and ceased in March 2022. Breeding season surveys commenced in April 2022 and ceased in August 2022.

4.55 The vantage point surveys recorded relatively small numbers of geese, most of which were greylag geese (pink-footed geese were recorded occasionally). These birds were commuting over the Study Area.

4.56 Red kite and goshawk flights were recorded on a number of occasions, and it was concluded that goshawk may have made a breeding attempt but no active nest was located. Peregrine, osprey and golden eagle were all recorded on a small number of occasions. Buzzard, kestrel and sparrowhawk were commonly recorded during Vantage Point watches.

4.57 Black grouse was recorded to the west of the site during black grouse surveys in the 2022 breeding season. The closest black grouse record was approximately 1 km from the nearest proposed Rivox Wind Energy Hub turbine location.

4.58 Nightjar was recorded audibly on two occasions during a mid-June nightjar survey. Both records were from within the proposed wind farm site.

South of Scotland Golden Eagle Project

4.59 The South of Scotland Golden Eagle Project (SSGEP) has been set up with the objective of reinforcing the population of golden eagles in the Scottish Borders and Dumfries & Galloway. A series of translocations has taken place and currently there are now approximately 45 eagles in the Borders (Cat Barlow pers. comm., Project Manager SSGEP). Almost all of the eagles are tagged so satellite data is available for their movements and habits.

4.60 Golden eagles are reported to frequent the Study Area, with birds occasionally roosting amongst the forestry and heading out to the west to hunt in the day, occasionally hunting in some areas of clear-fell plantation. Currently there are no nests reported in the Study Area.

Habitat Interest Summary

4.61 Phase 1 Habitat Survey (JNCC, 2016) and a National Vegetation Classification (NVC- Rodwell 2006) Survey were carried out for the proposed Daer Wind Farm in 2019 (Natural Power, 2021). The surveys covered the proposed Daer Wind Farm site and the proposed Access Route, which extends to the south-east, eventually joining the A701 at Raeknowes Moss, near Greystonerigg.

4.62 The survey work carried out for the proposed Daer Wind Farm recorded a wide range of NVC communities within the Study Area, along with various associated sub-communities and mosaic habitats. The most common and widespread communities in the wind farm site were:

- M23: *Juncus effusus/ acutiflorus-Galium palustre* mire
- U5: *Nardus stricta-Galium saxatile*; U6: *Juncus squarrosus - Festuca ovina*; U2: *Deschampsia flexuosa*; U4: *Festuca ovina-Agrostis capillaris-Galium saxatile* grasslands;
- M17: *Scirpus cespitosus-Eriophorum vaginatum*; M18: *Erica tetralix-Sphagnum papillosum*; M19: *Calluna vulgaris Eriophorum vaginatum* blanket mires; M2: *Sphagnum cupsidatum/recurvum*; M3: *Eriophorum angustifolium* bog pools;
- M15: *Scirpus cespitosus-Erica tetralix* wet heath; M17: *Scirpus cespitosus-Eriophorum vaginatum* blanket mire; M25: *Molinia caerulea-Potentilla erecta* mire;
- M19: *Calluna vulgaris-Eriophorum vaginatum*; M20: *Eriophorum vaginatum* blanket mires.

4.63 The surveys identified a total of 14 NVC communities, which are classed in SEPA guidance (SEPA, 2017) as indicative of potential Ground Water Dependent Terrestrial Ecosystems (GWDTEs), i.e., they may have moderate or high dependency on groundwater in certain hydrological settings.

4.64 The variation in vegetation communities and composition across the proposed Daer Wind Farm site reflects changes in soil and substrate type, soil moisture as well as anthropogenic influences on the vegetation (e.g. muir burning, grazing and drainage). Many areas are underlain by peat of various depths (Natural Power, 2021).

4.65 Coniferous plantation is extensive along the proposed Access Route.

4.66 Phase 1 Habitat Survey and National Vegetation Classification (NVC) survey were carried out for the proposed Rivox Wind Energy Hub in 2022 (LUC, 2022). The surveys covered part of the Study Area.

4.67 The survey data for the Rivox Wind Energy Hub indicate that coniferous plantation dominates the area – other habitats include:

- A1.2.2 Coniferous woodland (plantation)/B5 Marshy grassland
- A1.2.2 Coniferous woodland (plantation)/D5 Dry heath/acid grassland
- A4.2 Coniferous woodland (recently felled)
- C1.1 Bracken (continuous)
- A4.2 Coniferous woodland (recently felled)/B1.2 Acid grassland (semi-improved)
- D6 Wet heath/acid grassland
- B5 Marshy grassland

4.68 There are numerous small watercourses throughout the Study Area.

4.69 Five NVC communities were recorded which, according to guidance, may indicate groundwater dependency:

- M6 Carex echinata–Sphagnum recurvum/auriculatum mire
- M23 Juncus effusus/acutiflorus-Galium palustre rush-pasture
- M25 Molinia caerulea-Potentilla erecta mire

- MG9 Holcus lanatus-Deschampsia cespitosa grassland
- MG10 Holcus lanatus-Juncus effusus rush-pasture

4.70 Of these the M6 *Carex echinata–Sphagnum recurvum/auriculatum* mire community was the only one that was assessed as having high dependency on groundwater.

Faunal Interest Summary

4.71 Surveys carried out for the proposed Daer Wind Farm identified the following faunal species within the Study Area (Natural Power, 2021). Static bat detector surveys recorded activity from a minimum of seven species / species groups (soprano pipistrelle, common pipistrelle, Nathusius' pipistrelle, Myotis sp., noctule, Leisler's bat and brown long-eared bat). Nine potential bat roosting features were found during the bat roost surveys undertaken in September 2019 and August 2020.

4.72 Surveys carried out for the proposed Daer Wind Farm recorded otter spraints in 2019 along the Sweetshaw Burn, Crook Burn and Daer Water (Natural Power, 2021). There were records of recent otter spraint on Crook Burn and Daer Water, but all spraint records on Sweetshaw Burn were considered to be old. During the 2020 surveys along the proposed Access Route, otter signs were found along the Kinnelhead Water, Broadshaw Water, Lochan Burn and Rivox Burn. One otter holt was found along the Daer Water during 2019 surveys, and potential resting sites were found at four locations.

4.73 No signs of water vole were found within the proposed Daer Wind Farm site (Natural Power, 2021).

4.74 Badger was found to be present along the proposed Access Route, but the proposed Daer Wind Farm site was considered to offer limited areas of habitat suitable for supporting resident badgers. Two badger setts were found along the proposed Access Route.

4.75 Surveys carried out for the proposed Daer Wind Farm concluded that the site was unsuitable for red squirrel (Natural Power, 2021). Signs of squirrel feeding were recorded in woodland along the proposed Access Route. It was concluded that the main areas of squirrel activity were between Ingleston and Lochan Burn. It was considered that the observed signs could be of either grey or red squirrel, as both species were known to be present within the surrounding area.

4.76 Surveys carried out for the proposed Daer Wind Farm did not include specific reptile surveys (Natural Power, 2021). During habitat surveys in 2020 three areas of drystone wall were found within 10m of the proposed access route that had potential for use as reptile hibernacula: two near to the Kinnel Water and one on the edge of the forest near to Ingleston.

4.77 Surveys carried out for the proposed Rivox Wind Energy Hub (LUC, 2022) identified sixteen individual trees and eight stands of woodland where a bat suitability assessment concluded that the trees had 'Low' to 'High' bat roost potential.

4.78 Static bat detector surveys recorded activity from the following species / species groups: common pipistrelle Pipistrellus pipistrellus; soprano pipistrelle Pipistrellus pygmaeus; noctule bat Nyctalys noctule; Lesiler's bat Nyctalus leisleri; Daubenton's bat Myotis daubentoniid; Myotis spp.; and brown long-eared bat Plecotus auratus. Within the site, higher levels of bat activity

were generally associated with felled conifer plantation and the edges of mature conifer plantation. Activity levels were also highest during the autumn survey period. Pipistrellus spp. dominated the bat activity recorded during the surveys.

4.79 Surveys carried out in 2022 for the Rivox Wind Energy Hub (LUC, 2022) identified some suitable habitat for otter but noted that the area had been heavily impacted by commercial forestry plantation which reduced the suitability of most habitats. Limited evidence of otter presence was found.

4.80 Surveys also found that there was no evidence of water vole and that limited suitable habitat was present.

4.81 Surveys carried out in 2022 for the Rivox Wind Energy Hub found no field signs of red squirrel (LUC, 2022). The lack of evidence of red squirrel led to the conclusion that the area is not of importance for breeding red squirrel.

4.82 Surveys for the Rivox Wind Energy Hub found that the area supported limited evidence of pine marten (LUC, 2022). The majority of field signs recorded were scats, which were present in low levels across the Study Area. No pine marten dens were found.

4.83 The area was found to provide suitable habitat for reptiles and amphibians. Dry and wet heathland, scrub, and tussocky or rank grassland were all present and provide suitable opportunities for foraging, shelter and basking. Wetland and riparian areas may provide suitable habitats for amphibians for foraging, shelter and breeding. Although targeted surveys were not undertaken for reptiles or amphibians, several sightings were recorded during the ecological surveys for Rivox Wind Energy Hub. It was assumed that amphibians and reptiles were present in low densities throughout the Study Area.

Limitations

4.84 Survey work has yet to be completed and so an initial desk study assessment has been carried out using information that is publicly available. The main source of information has been the ecological and ornithological survey work that has been completed to inform the environmental impact assessment for the proposed Daer Wind Farm (Natural Power, 2021) and for the Rivox Wind Energy Hub (LUC, 2022). The scope of the available data is necessarily limited to the boundaries of the proposed wind farm sites and associated access routes.

Summary

4.85 Key natural heritage interests may include (subject to confirmation by survey):

- Notable habitats including blanket bog, wet and dry heath, marshy grassland, acid flush, base rich flush, unimproved grassland, woodland and watercourses.
- Potential GWDTEs.
- Various watercourses that are likely to be used by salmonid fish, lampreys, otter and potentially water vole (although no water voles have been found during surveys carried out for the proposed Daer Wind Farm and Rivox Wind Energy Hub.
- Breeding, foraging and passage birds in the area.
- Badgers, which may use habitats along the overhead line route corridors.
- Bats, which may use habitats along the overhead line route corridors.

- Red squirrels, which may use habitats along the overhead line route corridors.
- Pine marten, which may use habitats along the overhead line route corridors.

4.86 Following review of the available historical data, including the results of survey work completed for the Daer Wind Farm (Natural Power, 2021) and the Rivox Wind Energy Hub (LUC, 2022), the following survey work is proposed along the Preferred Route in the study area:
- Extended Phase 1 Habitat Survey and identification of wetland habitat[33];
- NVC survey of GWDTEs that may be affected by the proposals;
- Breeding bird surveys (potentially including black grouse, raptor and wader surveys);
- Vantage point flight activity surveys;
- Bat habitat assessment (including roost assessments where required);
- Badger survey of the route corridor;
- Red squirrel survey of suitable habitat within the route corridor;
- Otter and water vole survey of watercourse crossings;
- Assessment of habitat suitability for reptiles;
- Fish habitat assessment of watercourse crossings.

Cultural Heritage **(Figure 4.4)**

4.69 Digital baseline information on known cultural heritage assets recorded within a rectangular Assessment Study Search Area of 462 km^2 (NGRs NX 93 93/NY 15 93 to NS 93 14/NT 15 14) was obtained in November and December 2020 from datasets curated by Historic Environment Scotland (HES), West of Scotland Archaeology Service (WoSAS), on behalf of South Lanarkshire Council (SLC), and from Dumfries and Galloway Council (DGC).

4.70 The HES datasets were reviewed and checked in 2023 and it is noted that there have been no changes to, or additions of, designated heritage assets since the data was obtained in 2020.

4.71 Within this search area, designated cultural heritage assets consist of:
- 63 Scheduled Monuments (SM) of national heritage value and with statutory protection.
- 189 Listed Buildings (LB) with statutory protection (ten Category A (national heritage value); 96 Category B (regional heritage value); 83 Category C (local heritage value)).
- One Conservation Area (CA) of regional heritage value and with statutory protection: Moffat (within which most (106) of the Listed Buildings (3 Category A; 47 Category B; 56 Category C are located).
- One Inventory Garden and Designed Landscape (GDL) of national heritage value: Raehills.
- One Archaeologically Sensitive Area (ASA): Beattock ASA (designated by Dumfries and Galloway Council with a classification of regional heritage value).

4.72 In addition to these assets, local authority Historic Environment Records (HERs), as recorded in 2020, contain details of more than 1300 non-designated assets of archaeological and cultural heritage interest within the Assessment Study Search Area. Of these non-designated assets, around 70 are classified, in the HER entries, as potentially being of national heritage value (Non-Statutory Register (NSR) sites). These numbers are not likely to have changed significantly and

[33] The identification of wetland habitats is the first stage in the process of identifying and evaluating Ground Water Dependent Terrestrial Ecosystems. It is done with reference to SNIFFER (2009) WFD95: A Functional Wetland Typology for Scotland - Project Report. ISBN: 978-1-906934-21-7.

the overall character of the baseline is considered to remain valid for this project stage. Updated data will be acquired for the EIAR stage.

4.73 The assets are diverse in both their date and their character and reflect human occupation and exploitation of the landscape since early prehistory. They include prehistoric burial and ritual sites, and settlements; Roman military forts, temporary camps and roads; medieval and later rural farming settlements; medieval-post-medieval industrial (mining) remains; and historic buildings and designed landscapes.

Geology and Hydrology **(Figures 4.5 & 4.6)**

4.74 This section presents an overview of the geological and hydrological information collated to date for the Study Area.

Soils and Peat

4.75 The soils mapped in the Study Area include peat, peaty gleys, peaty podzols, mineral gleys, alluvial soils and brown soils (Scotland's Soils, 2022). The soils mapped around the M74 corridor and Moffat comprise alluvial soils (originating from recent riverine alluvial deposits) and brown soils of either the Ettrick soil association (derived from greywackes and shales) or the Holywood soil association (derived from sandstones and conglomerates). Peat, peaty podzol and peaty gley soils are dominant in the rest of the Study Area. Non-calcareous mineral gleys (also of the Ettrick soil association) are mapped in localised parts of the northern and southern extents of the Study Area.

4.76 Localised areas of peat are mapped across the Study Area (BGS, 2022). Many of these are located near watercourses that feed into Daer Reservoir. There is a larger area of peat mapped along Garpol Water in the forestry near Hangingshaw Hill. Peat deposits are also mapped towards the south of the Study Area at, and around the vicinity of, Haw Moss. The areas of peat are typically associated with areas of mapped Glacial Till, which indicates the peat may be forming where there is input from surface water and poor drainage.

4.77 As part of studies completed for the proposed Daer Wind Farm (Natural Power, 2021), peat depth mapping was undertaken on the land between Daer Reservoir and the forestry to the east, which is in the northwest of the Study Area. The peat depth probing and interpolation indicates that the peat in that area is mostly less than 1 m thick, but there are areas of deeper peat up to, and greater than, 2.5 m thick. The associated peat slide risk assessment concluded that large-scale translational mass movement of peat is unlikely, but that peat close to watercourses could enter the watercourse and be entrained; thereby having the potential to affect other receptors.

4.77 The Carbon and Peatland Map (Scotland's Soils, 2022) gives a value to indicate the likely presence of carbon-rich soils, deep peat and priority peatland habitat. Mapping is divided into categories of non-soil, unknown soils, mineral soils, and Class 1 to Class 5 peatland. For peatland, Class 1 is assigned to nationally important carbon rich, deep peat or priority habitat peatland and indicate areas that are likely to be of high conservation value. Class 2 indicates that same national importance, but where the soils/peat/habitats have the potential to have high conservation value and restoration potential. Classes 3 to 5 are not priority habitats. Class 3 includes carbon rich soils and may include deep peat. Class 4 is unlikely to include carbon rich soils or peat. Class 5 is assigned to areas where no peatland habitat is recorded. Most of the soils in the Study Area are either not classified as peatland, or are within classes 3 to 5 (**Figure**

4.5). There are areas of Class 1 and Class 2 priority peatland mapped in the western part of the Study Area towards Daer Reservoir.

Geology

4.78 Much of the Study Area is mapped by the British Geological Survey (BGS, 2022) as not having any superficial deposits at the surface (i.e. soils directly overlie bedrock, or exposed bedrock would be encountered at the surface). Superficial deposits are typically mapped along watercourses and in the main river valleys, as well as on land away from hills. Alluvium, glaciofluvial deposits and/or glacial till deposits comprising varying proportions of gravel, sand, silt and clay are mapped along the River Annan, Garpol Water, Kinnel Water and Cloffin Burn. Alluvium and/or glacial till deposits are also mapped along many of the smaller watercourses and away from the topographic highs (BGS, 2022).

4.79 The British Geological Survey (BGS, 2022) maps the majority of the bedrock in the Study Area between Daer Reservoir and the M74 as comprising rocks of the Gala Group (specifically Gala Unit 4 and the Queensberry Formation). These are a series of graded turbidite deposits that include wacke sandstone, siltstone and mudstone in varying proportions. Within the Queensberry Formation, there are also mapped small areas of the Moffat Shale Group that are elongated south-west to north-east. The Moffat Shale Group comprises shale, bentonite and tuff. The southern part of the Study Area towards Kinnelbank and Haw Moss is underlain by the Selcoth Formation, which comprises sandstone interbedded with siltstone or silty mudstone and is part of the Ettrick Group. To the east of the M74, the mapped bedrock includes the Queensberry Formation and the Hartfield Formation (part of the Stewartry Group). The Hartfield Formation comprises red silty sandstone interbedded with pebbly sandstone and lenses of breccio-conglomerate. A series of southwest-northeast trending faults are mapped throughout the Study Area. These are sometimes intersected by faults that trend close to north-south.

Mining

4.80 Information from the Coal Authority database (The Coal Authority, 2022) indicates that the Study Area is not located within a coal mining reporting area or development high risk area. There are no mapped mine entry point or records of abandoned mines. There are also no mine heads, shafts, workings or tips identified on the Ordnance Survey 1:25,000 mapping of the area.

Hydrology

4.81 There are numerous burns mapped in the Study Area that originate towards the tops of the hills. These may not flow all year round and their flow is likely to be dependent on precipitation in the preceding time period (i.e. the burns are likely to be ephemeral). These burns feed into either Evan Water, the River Annan, Garpol Water, Kinnel Water, Cloffin Burn or Daer Reservoir. The location of these can be seen in **Figure 1.1**. Garpol Water and Cloffin Burn flow into Evan Water as it parallels the M74. Evan Water converges with Annan Water near Beattock, South of Moffat. Kinnel Water also flows into Annan Water approximately 20 km south of Moffat, near Lockerbie.

4.82 The Study Area straddles the watershed between the River Annan and River Clyde catchment areas (Scotland's Environment, 2022). The watercourses in the northwest of the Study Area that feed into Daer Reservoir ultimately flow into the River Clyde. The watercourses in the rest of the Study Area (including those that flow into Evan Water and Kinnel Water) ultimately flow into the River Annan.

4.83 The larger water bodies in the Study Area have been classified under the Water Framework Directive (2000/60/EC) as either 'bad', 'poor', 'moderate', 'good' or 'high' for their ecological and water quality status. Where it is feasible to do so, the objective is to achieve good status or better in water bodies by 2027. For 2020 (the most recent published classification year), Daer Reservoir is classified as a heavily modified water body with 'good' ecological potential and water quality (SEPA, 2022c). Daer Water (where it flows out of Daer Reservoir) is classified as having 'moderate' ecological potential due to invasive species, and 'high' water quality. The Cloffin Burn, Kinnel Water, Evan Water and the River Annan have been classified as having 'poor' overall status. All are affected by man-made barriers to fish migration. With respect to water quality, the Cloffin Burn has 'high' status, and the River Annan, Kinnel Water and Evan Water have 'good' status. Garpol Water is classified as having 'good' overall status and 'high' water quality status.

4.84 Surface waters and their catchments that feed into Daer Reservoir are classified as a Drinking Water Protected Area under The Water Framework Directive and The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2007 (Scottish Government, 2022).

4.85 Flood risk mapping published by SEPA (2022a) shows fluvial (river) flood risk is limited to the area immediately adjacent to the larger watercourses. This includes those that feed into Daer Reservoir (e.g. Shiel Burn, Crook Burn and Daer Water) and Cloffin Burn, Garpol Water, Kinnel Water, the River Annan, and many of the larger tributaries to these watercourses. There is 'high' (10% chance of flooding each year), 'medium' likelihood (0.5% chance of flooding each year) or sometimes 'low' (0.1% chance of flooding each year) of river flooding immediately adjacent to the watercourse channels.

4.86 There is an area of low (0.1% chance of flooding each year) to high (10% chance of flooding each year) likelihood of surface water flooding at Daer Reservoir (SEPA, 2022a). There are also localised small areas of medium (0.5% chance of flooding each year) to high likelihood of surface water flooding dotted all over the Study Area. These appear to be associated with the upmost reaches of the watercourses or may be associated with topographic depressions.

Hydrogeology

4.87 Most of the bedrock geology within the Study Area is described as a low productivity aquifer with limited groundwater in near surface weathered zones and secondary fractures (BGS, 2022). The likelihood of there being significant groundwater abstractions for supply from these strata is considered to be low. Such Silurian-Ordovician aquifers have not been investigated as a source of higher yield public supplies due to their low productivity (BGS, 2015). Groundwater flow occurs at relatively shallow depths and typically along short, localised pathways. Private supplies are possible, and the median yield from operational borehole records is 0.3 l/s.

4.88 The rocks of the Stewartry Group are described as a highly productive aquifer with flow predominantly through fractures and other discontinuities (Scotland's Environment, 2022). This geology can represent a regionally important aquifer that is up to 1,500 m thick with the sandstones and breccias yielding up to 40 l/s (BGS, 2022).

4.89 Groundwater in the Study Area is likely to be vulnerable to pollution due the limited superficial and soil cover offering limited contamination attenuation.

4.90 The northwest of the Study Area is located within the Leadhills groundwater body area, which is within the Clyde Sub-Basin District (Scotland's Environment, 2022). The Leadhills groundwater body is classified as having a 'poor' overall groundwater classification status ('good' quantitative status, but 'poor' quality). The pressures identified on this waterbody are largely related to legacy pollution from mining and quarrying (SEPA, 2022d). Where it is feasible to do so, the objective is to achieve good status or better in water bodies by 2027.

4.91 The central and southern parts of the Study Area are within the East Dumfriesshire groundwater body area, which is within the Solway Sub-Basin District (Scotland's Environment, 2022). The East Dumfriesshire groundwater body area is classified as having a 'good' overall groundwater classification status (both quantitative and quality).

4.92 The Annandale Sand and Gravel groundwater body and the Moffat groundwater body (both also part of the Solway Sub-Basin District) underlie the area around Moffat and the valleys of the River Annan and Evan Water (Scotland's Environment, 2022). These groundwater bodies are classified as having a 'good' overall groundwater classification status (both quantitative and quality).

4.93 The Study Area is located in a Drinking Water Protected Area under The Water Framework Directive and The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2007 (Scottish Government, 2022). All groundwater bodies in a Scotland River Basin District are defined as Drinking Water Protected Areas.

4.94 Information presented in the EIAR for the proposed Daer Wind Farm (Natural Power, 2021) indicates that the Daer Reservoir catchment provides drinking water to approximately 250,000 Scottish Water customers and is also used for the generation of hydroelectric power. The report also indicates that there are water use authorisations and private water supplies in the hydrological Study Area. Consultation and assessment will be required in order to determine where these are located and if they could be impacted by the proposed Daer Wind Farm grid connection.

4.95 Wetlands are of both hydrological and ecological importance. Ecological aspects of wetlands are discussed in the Ecology Section. The features mentioned here focus on the hydrological importance. There are no wetlands of international importance (i.e. Ramsar sites) located in the Study Area (DEFRA, 2022).

4.96 The Scottish Wetland Inventory (Scotland's Environment, 2022) indicates that there are wetlands recorded within the Study Area (**Figure 4.6**). These wetland areas are concentrated to the west of the Study Area, including where the proposed Daer Wind Farm is located. Peatbog is the main wetland habitat mapped. However, the overall wetland area comprises a patchwork of peatbog; wet grassland (marshy grassland and montane grassland); springs, flushes and seepages; wet heath; and non-specific wetland.

4.97 Potential groundwater dependent terrestrial ecosystems (GWDTE) were identified in the northwest part of the Study Area as part of the proposed Daer Wind Farm baseline work (Natural Power, 2020/2021). These potential GWDTE included wet heath, modified bog, marsh grassland, acid grassland, improved grassland, acid/neutral flush, rush pasture, calcareous grassland, flush mire, calcareous flush mire and spring communities. Wet heath and blanket

peat dominate. Of the 30 clusters of potential GWDTE, 11 were identified in the assessment as having moderate/high likely dependence on groundwater. The potential mechanism for groundwater input was identified as seeps from steeper slopes where there was no obvious ponding of surface water or other surface water input. Nine clusters were identified as having moderate likely dependence on groundwater through shallow seepages. However, these were located adjacent to watercourses, and surface water was considered to be the main input.

4.98 The hydrological and ecological work undertaken from the proposed Daer Wind Farm encompasses many of the areas mapped by other sources as being covered in peat or wetlands. Given the findings of the Daer Wind Farm GWDTE assessment (Natural Power, 2021), where there are mapped areas of peat or wetland outside the areas included in that work, there is potential for GWDTE. Their identification as potential GWDTE will depend on the findings of ecological survey work undertaken for the Daer 132kV Connection Project. The actual dependence on groundwater of any potential GWDTE will depend on the hydrological and hydrogeological setting at each location.

4.99 There is an area of low likelihood of groundwater flooding located around Beattock, to the south of Moffat (SEPA, 2022b). This is where groundwater could influence the duration and extent of flooding from other sources, such as surface water (i.e. groundwater is a contributing factor rather than the primary source of flooding). SEPA defines groundwater flooding as being caused by water rising up from underlying rocks or flowing from springs.

Designated Sites

4.100 There are no international or national sites designated for their geological importance located within the Study Area (DEFRA, 2022). There are also no Geological Conservation Review sites (Scotland's Environment, 2022).

4.101 Shiel Dod Site of Special Scientific Interest (SSSI) is located southwest of the proposed Daer Wind Farm (**Figure 4.3**). It is designated for its biological interest (upland habitats and upland assemblages). This includes habitats such as blanket bog and calcareous types of spring-head, rill and flush (Scottish Natural Heritage, 2010). These habitats could have some dependence on groundwater and/or surface water. However, the SSSI is located to the southwest of Daer Reservoir and it is unlikely to be hydrologically linked to the proposed grid connection development.

4.102 Other designated sites in the Study Area are considered to be too far from the proposed Daer 132kV Connection to be feasibly connected geologically or hydrologically.

Summary

4.103 The baseline information indicates that the key geological and hydrological aspects of interest (i.e. likely receptors) located within the Study Area are:

- Areas of priority peatland habitat (cross-over with Nature Conservation);
- Hydrological/hydrogeological regimes supporting areas of peat;
- Hydrological/hydrogeological regimes supporting areas of potential GWDTE;
- The quality and flow of water in the surface watercourses;
- Surface water and groundwater that provide sources of public and private water supply or feed into a protected drinking water area (quality and quantity);
- Infrastructure in areas that are at risk of flooding.

Commercial Forestry (**Figure 4.7**)

4.112 The Study Area contains large scale commercial forestry, state-owned and managed by Forestry and Land Scotland (FLS). The forestry within the Study Area is covered by the Beattock Composite Land Management Plan (LMP) which runs from 2017 - 2027 and includes the forest blocks of Greskine, Rivox, Longbedholm, Earshaig and Blacklaw. The LMP extends to 3672 Ha. **Figure 4.7** also indicates the findings of the Native Woodland Survey of Scotland (NWSS) which provides baseline nature conservation information and is used to inform LMPs.

4.113 The forests contain a range of woodland types and age classes due to original planting programme together with areas of unplantable land and open ground. The crops are comprised largely of commercial conifers with areas of mixed broadleaves and open ground. The woodlands are in the production phase with rotational felling and restocking underway.

4.114 One of the original key objectives of the Forestry Commission (now FLS) was forest expansion, in both state and private forests, to produce a strategic reserve of timber, and consequently, a limited range of species was planted. More recently, greater emphasis has been placed on developing multi-purpose forests, which require a restructuring of age and species in existing woodlands. Restructuring is achieved through the forest planning process.

4.115 A Forest Plan, termed either a Land Management Plan (LMP) or Forest Design Plan (FDP) in the State sector, relates to individual forests or groups of woodlands. It describes the woodlands, places them in context with the surrounding area, and identifies issues that are relevant to the woodland or forest. Forest Plans describe how the long-term strategy would meet the management objectives of the owner, the criteria of the UK Forestry Standard (UKFS)[34] and the UK Woodland Assurance Standard 4th Edition (UKWAS)[35], under which the woodlands would be managed if certificated. The UKFS is the benchmark for sustainable forestry and Scottish Government is committed to its use.

4.116 The Forest Plan involves a scoping exercise whereby the views of Statutory Consultees, neighbours and stakeholders are sought, resulting in an agreed Scoping Report. The results of the scoping exercise are incorporated into the Forest Plan. The Forest Plan covers all aspects, such as conservation, archaeology, landscape and the local community in addition to forestry and silvicultural considerations.

4.117 Restructuring of age class and species are important factors in this process to ensure proposals meet the current standards. A Forest Plan will typically contain felling and restocking proposals covering a 10 year period in detail, with outline proposals for the remainder of the forest.

4.118 Restructuring presents forest managers with many challenges and opportunities, particularly in relation to the management of potential catastrophic windblow. The forest planning process allows forest managers to review and revise proposals in a structured way to take account of such external factors. The inclusion of an overhead line within the forest is an example of one such external factor.

[34] Forestry Commission (2017). The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission, Edinburgh.

[35] UKWAS (2018). The UK Woodland Assurance Standard Fourth Edition, UKWAS, Edinburgh.

4.119 The current guidelines require diversification of species and woodland types as part of the forest planning process, specifically an increase in the proportion of broadleaf woodland, other conifers, and open ground. The incorporation of the proposed Daer 132kV Grid Connection into the forest would result in further restructuring of the crop.

4.120 The principle aim of the Beattock LMP is stated as;

- The principal factor of the plan is continued timber production and maintaining the principal species as Sitka spruce. There are areas identified as "treasured[36]" and these are of higher importance for landscape, habitat and biodiversity where timber productivity will be of much lower importance.

- The design of the Greskine Bank will be of key importance in the "treasured" area as this is the "Gateway to Scotland" and is the first close-up view of Scottish Forestry experienced by motorists on the M74 when travelling north from England.

- The primary objectives for the plan area are: to sustain a productive forest for the production of timber; to design a forest to be resilient to changes in climate and to provide mitigation through carbon lockup; to improve the landscape and develop it in an aesthetically pleasing way.

4.121 The Beattock LMP outlines approximately 967 ha of felling and 555 ha of restocking over the plan period. The composition of the woodlands at the time of preparing the LMP was predominately Sitka spruce – accounting for approximately 69% of the area. The second largest component was designed open ground at 16%. Other conifer species form 11% and native broadleaves 3%. By the end of the plan period (2027) the aim is to reduce the percentage of Sitka spruce to 57% and increase the native broadleaves to 4%. Open ground will still form the second largest component at 28%.

4.122 The areas of open ground identified in the LMP primarily follow existing watercourses and the alignment of the national gas pipeline through Earshaig and Rivox forests. Areas of open ground have been increased in the west of Rivox, tops of hills in Earshaig and elevated areas of Greskine.

4.123 Other important areas for biodiversity encompass woodlands identified for minimum intervention, which are identified in the LMP for future mixed/ broad leaved planting. Two "nature reserves" are identified within Rivox forest to the west. The LMP notes that in these areas "nature conservation and biodiversity are the highest priority and there will be no management intervention"[37]. The LMP notes that black grouse habitat has been implemented along the western edge of Rivox and Earshaig where the topography offers shelter for a more diverse range of species.

4.124 A critical success factor identified for this commercial forest is identified to be "resilient coupe shapes". This reflects an issue of tree stability due to wind damage to forest blocks in exposed elevated areas. The LMP notes that felling operations in Rivox have shown that adjacent woodland blocks are very susceptible to wind damage after this work.

[36] BCMP(2017) p21 "Treasured" areas are noted to encompass the highly visible sensitive lower slopes adjacent the motorway and railway.

[37] BCMP(2017) p24

4.125 The LMP will "introduce the concept of hill top coupes and planting design with future harvesting operations in mind, rather than just replanting the existing shapes."[38] It is noted, "future crops will need to be both wind firm and fit with the landscape, particularly in the areas of high visibility."[39] This is reflected in a more organic forest design encompassing the hill tops and increased gaps between coups to create a more wind firm edge. Future phased felling will therefore have a lower impact as the removal of one coup will not adversely increase the exposure of remaining areas to wind damage.

4.126 The Rivox Wind Energy Hub EIAR notes that compensatory planting will be required to mitigate for the loss of felled woodland areas to accommodate the proposed development (LUC, 2022). The extent, location and composition of such planting will be agreed with FLS taking into account revisions to the felling and restocking plans. Outline felling and restocking plans are provided in the EIAR (Appendix 4.0 Figures 4.4 f,g,h)

Recreation Features/ Routes (**Figure 4.8**)

4.127 In summary the main recreational features, attractions and routes located in the Study Area are as follows: -

- Beattock Forest comprising of Rivox, Earshaig, Longbedholm, Greskine and Blacklaw used for walkers, cyclists, car rallies, 7 stanes MTB tracks, Countryside Horse trail etc.
- Moffat is an important tourist destination and base for exploring the surroundings
- Moffat Golf Course
- Caravan Sites at Moffat, Beattock and Craigielands
- Southern Upland Way
- Romans and Reivers Route
- Annandale Way
- Numerous walks identified as Core Paths
- Earshaig Lochans Nature Reserve
- Earshaig Car Park
- Crooked Road- used informally to park, view Annandale valley and access Beattock Forest.

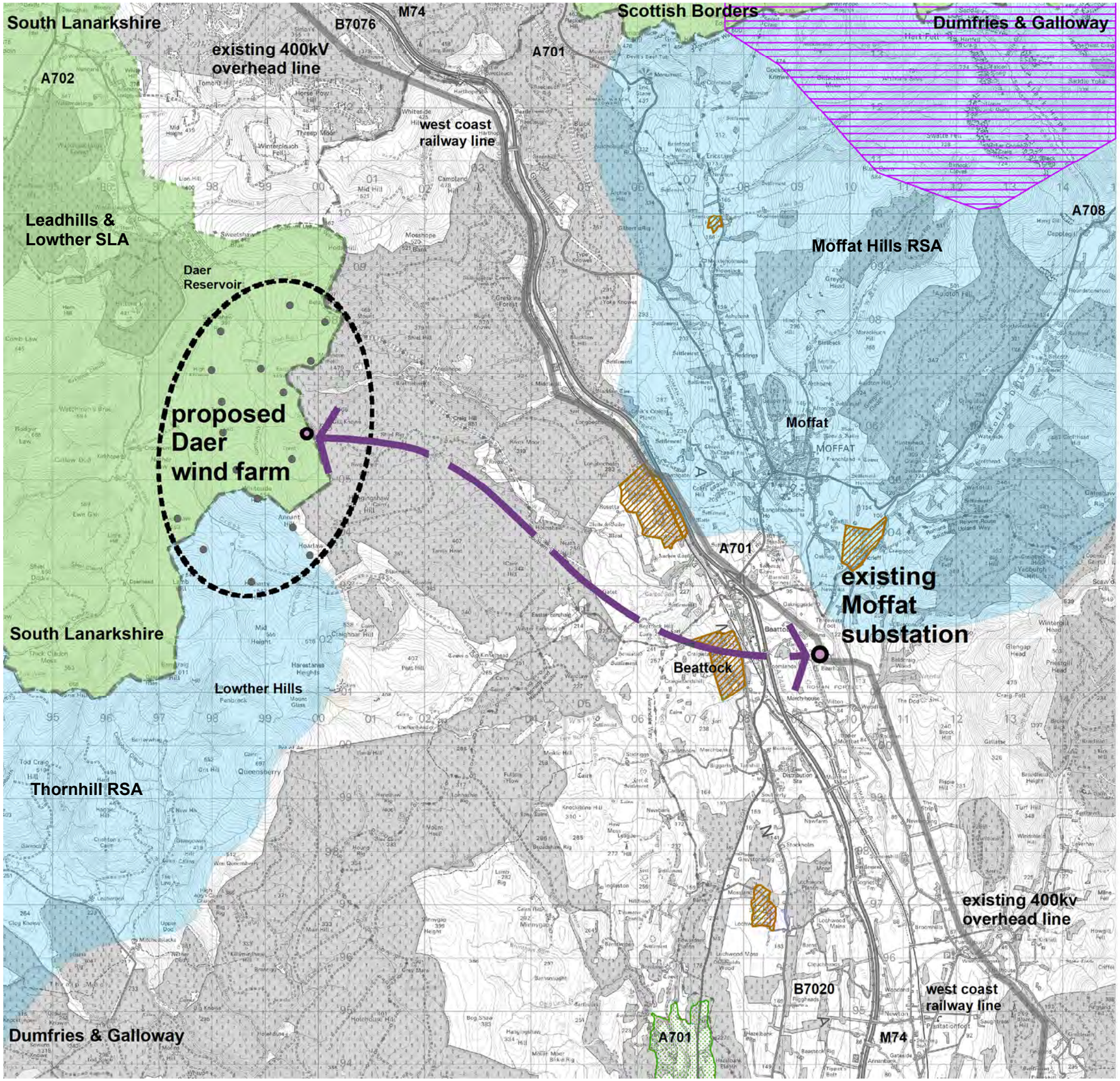
Other

4.128 Other existing features of note within the Study Area include:

- National Gas Pipeline
- Gas Distribution Station
- North West Ethylene Pipelines

[38] BCMP(2017) p7

[39] BCMP(2017) p11



Key:

- Special Landscape Area
- Regional Scenic Area
- Wildland
- Inventory Garden and Designed Landscapes (IGDL)
- Non-Inventory Garden and Designed Landscapes (Indicative Only) (NIDL)

0 1 2 4km

figure 4.1

Title:

Landscape Designations

Project:

Proposed 132kV Connection to Daer Wind Farm

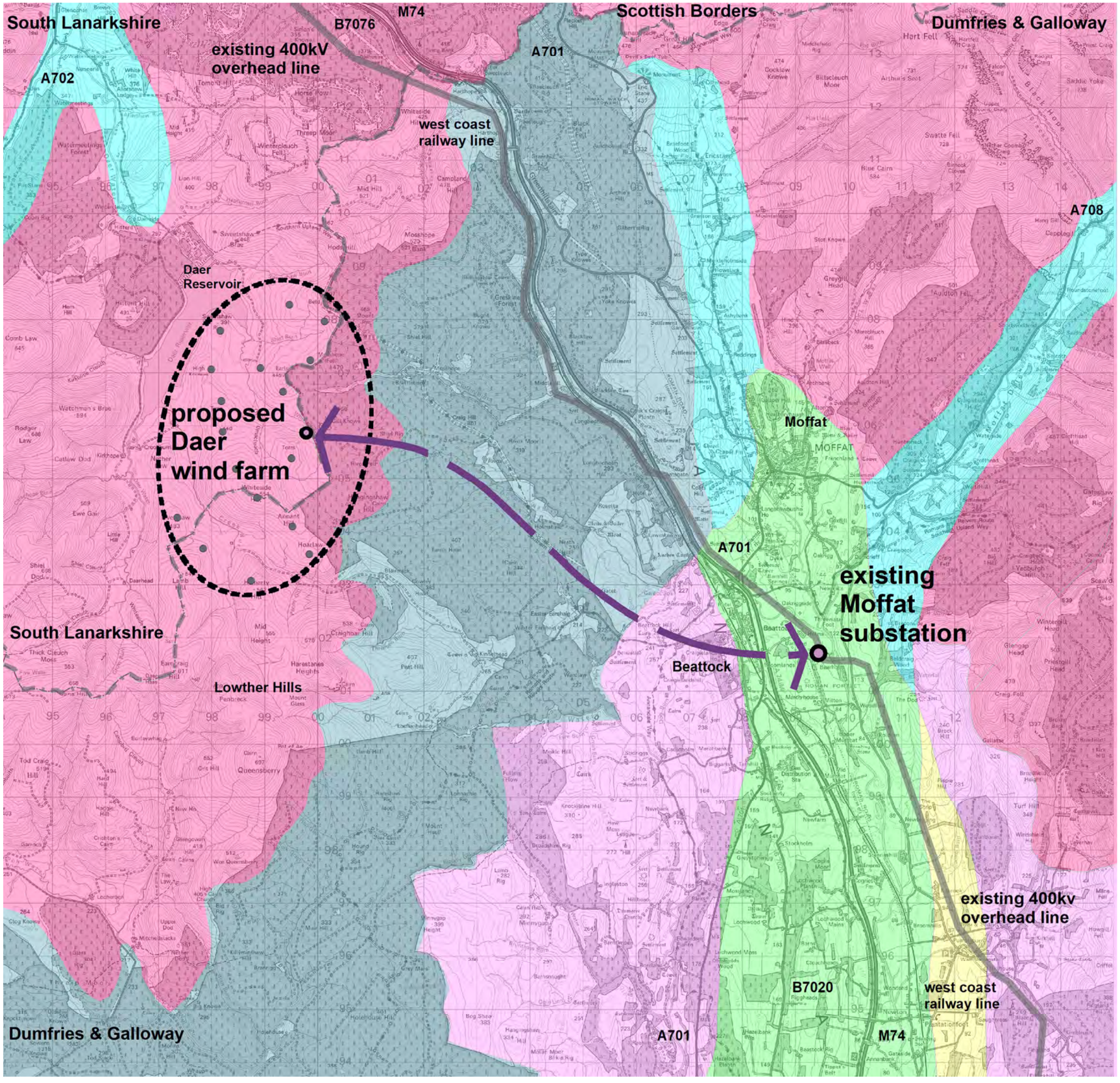
Project No:

Scale: 1:75,000 at A3
Other refer Bar Scale

Date: Feb 2024

SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning



Key:

- Foothills
- Foothills with Forest
- Middle Dale
- Southern Uplands
- Upland Fringe
- Upland Glen

0 1 2 4km

figure 4.2

Title:

Landscape Character Types

Project:

Proposed 132kV Connection to Daer Wind Farm

Project No:

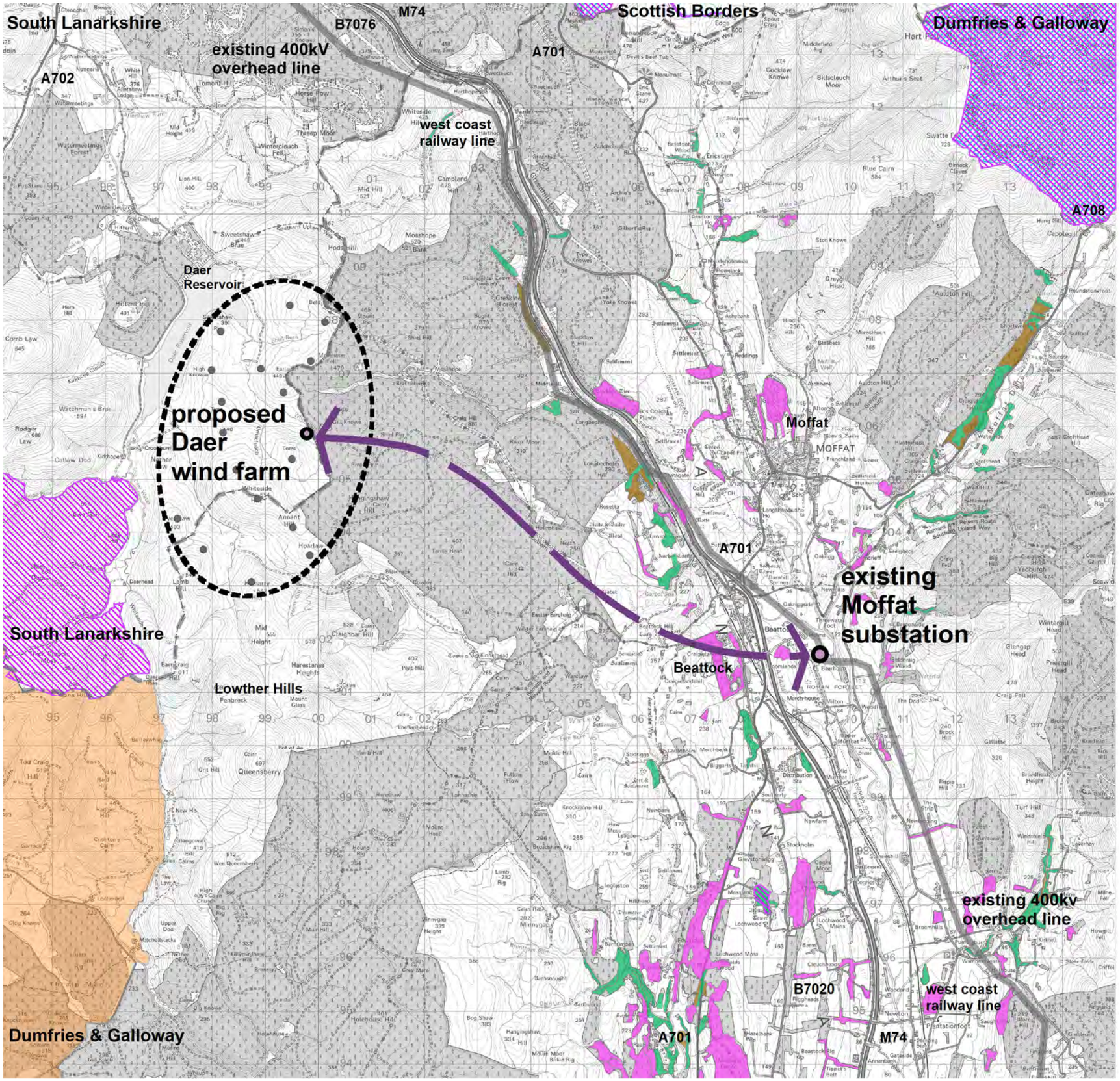
Scale: 1:75,000 at A3

Other refer Bar Scale

Date: Feb 2024

SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning



Key:

- Special Area for Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Biosphere Reserve
- Ancient Woodland (of semi-natural origin)
- Long-Established Woodland (of plantation origin)
- Other Woodland (on Roy map)

0 1 2 4km

figure 4.3

Title:

Natural Heritage

Project:

Proposed 132kV Connection to Daer Wind Farm

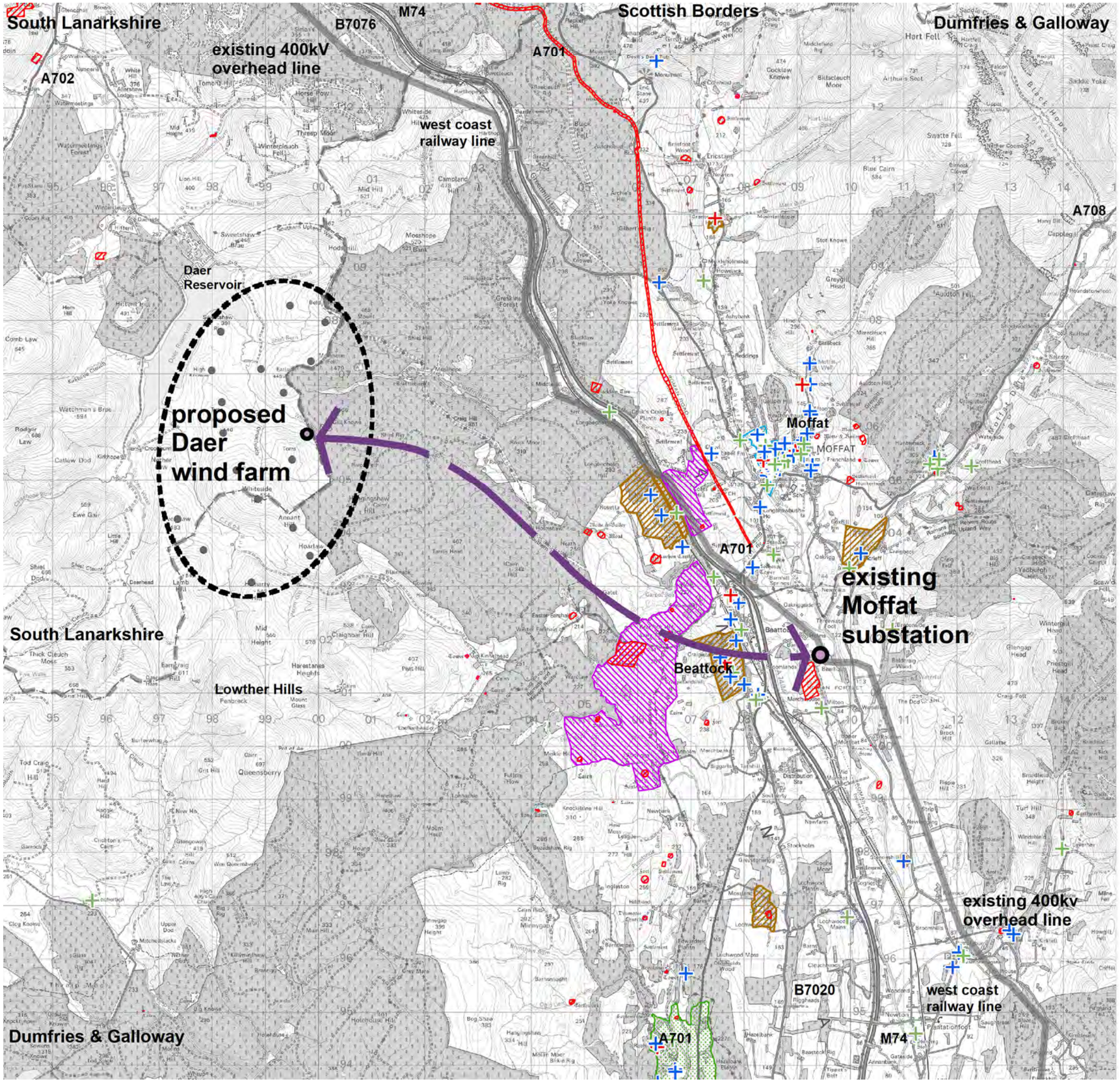
Project No:

Scale: 1:75,000 at A3
Other refer Bar Scale

Date: Feb 2024

SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning



Key:

- Listed Building Category A
- Listed Building Category B
- Listed Building Category C
- Scheduled Monument
- Conservation Area
- Inventory Garden and Designed Landscapes (IGDL)
- Non-Inventory Garden and Designed Landscapes (Indicative Only) (NIDL)
- Archaeologically Sensitive Areas (Indicative)

0 1 2 4km

figure 4.4

Title:

Cultural Heritage

Project:

Proposed 132kV Connection to Daer Wind Farm

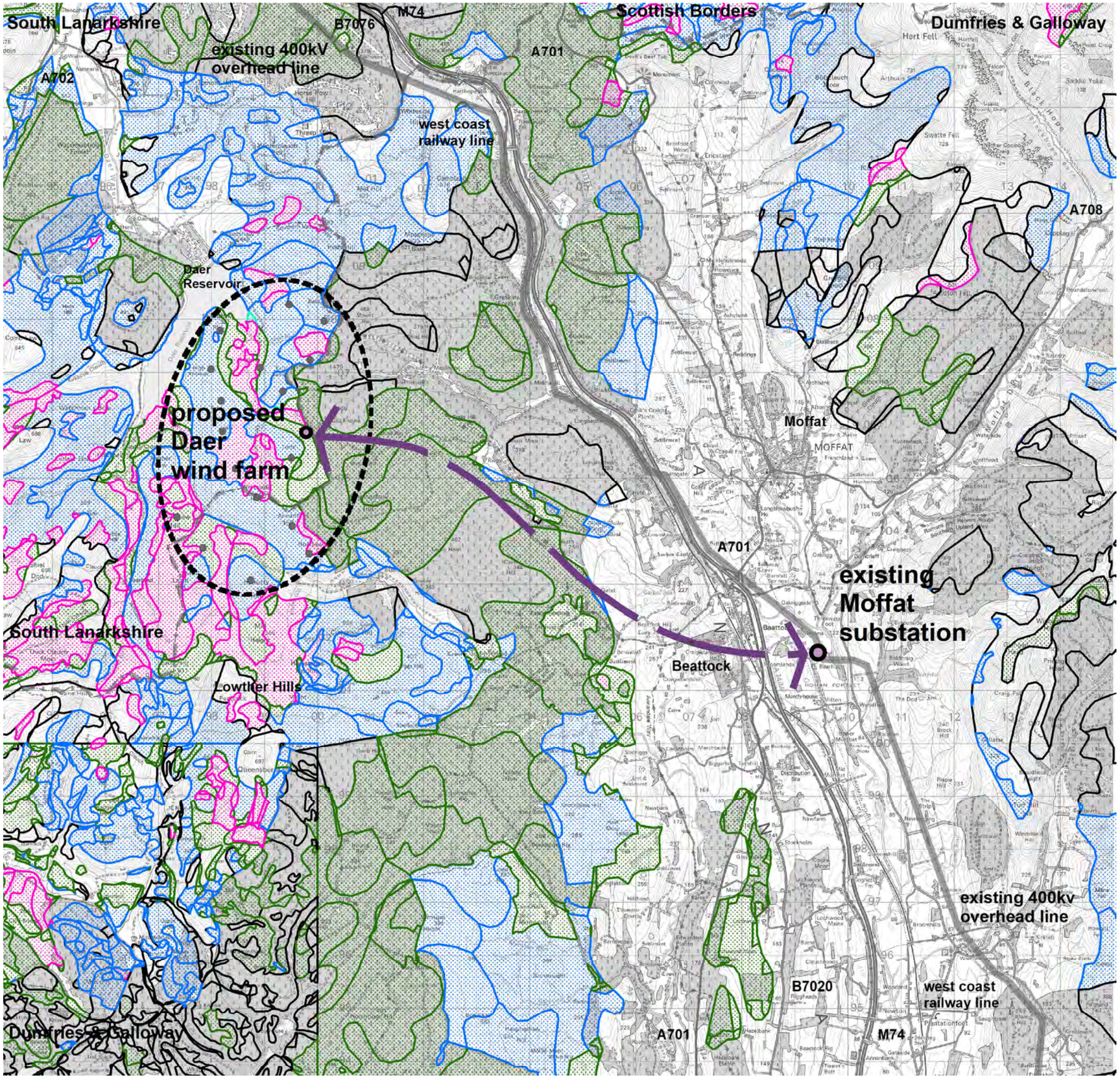
Project No:

Scale: 1:75,000 at A3
Other refer Bar Scale

Date: Feb 2024

SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning



Key:
Carbon and Peatland Data_NatureScot

- Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value
- Class 2 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential
- Class 3 - Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat
- Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils
- Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat

0 1 2 4km

figure 4.5

Title:

Carbon & Peatland Data

Project:

Proposed 132kV Connection to Daer Wind Farm

Project No:

Scale: 1:75,000 at A3

Other refer Bar Scale

Date: Feb 2024

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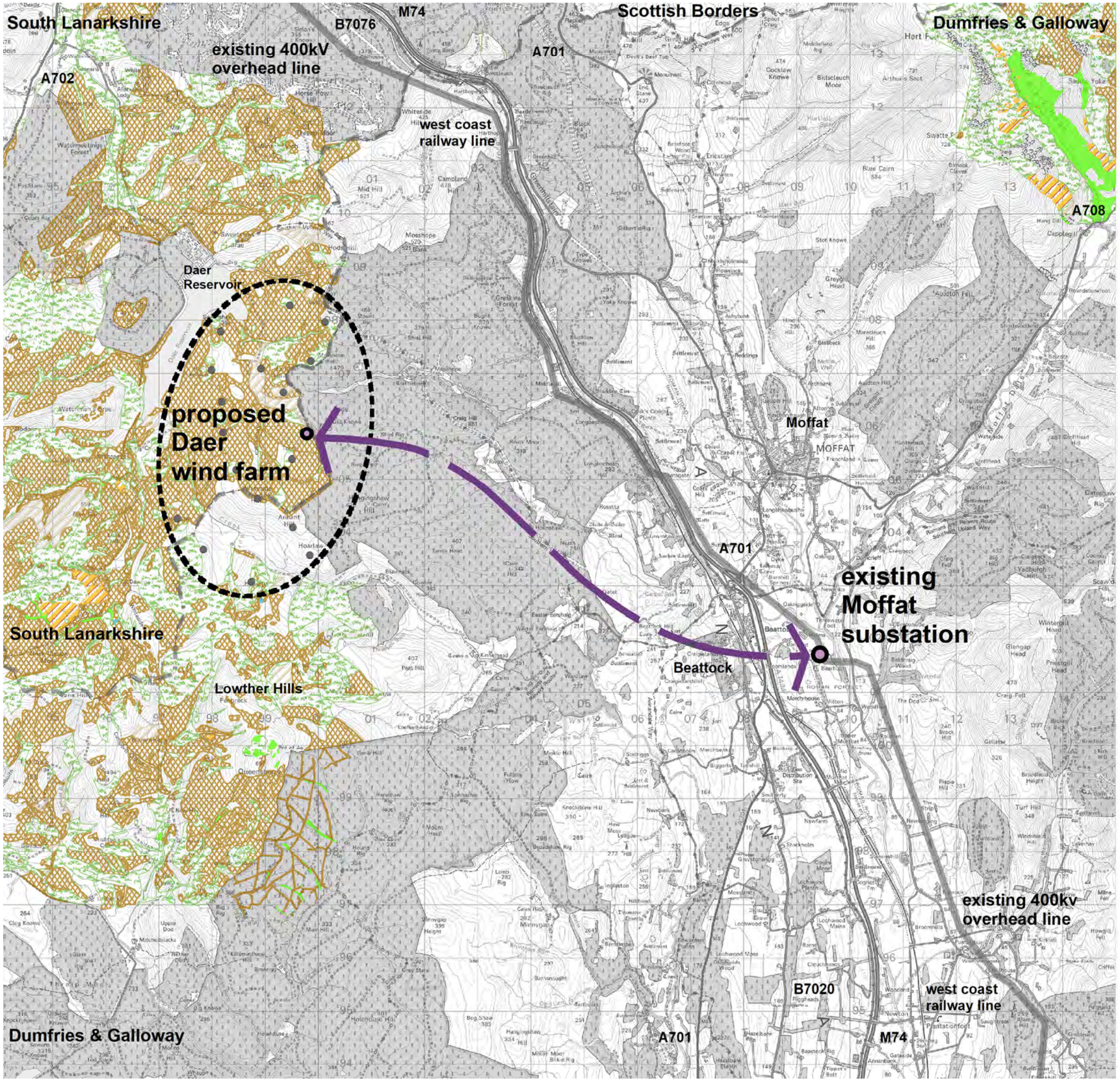
Landscape Architecture + Planning



Key:
Scottish Wetland Inventory

- Fen
- Non-Specific Wetland
- Peat Bog
- Springs, Flushes and Seepages
- Wet Grassland
- Wet Heath

0 1 2 4km

figure 4.6

Title:

Wetland Inventory

Project:

Proposed 132kV Connection to Daer Wind Farm

Project No:

Scale: 1:75,000 at A3
Other refer Bar Scale

Date: Feb 2024
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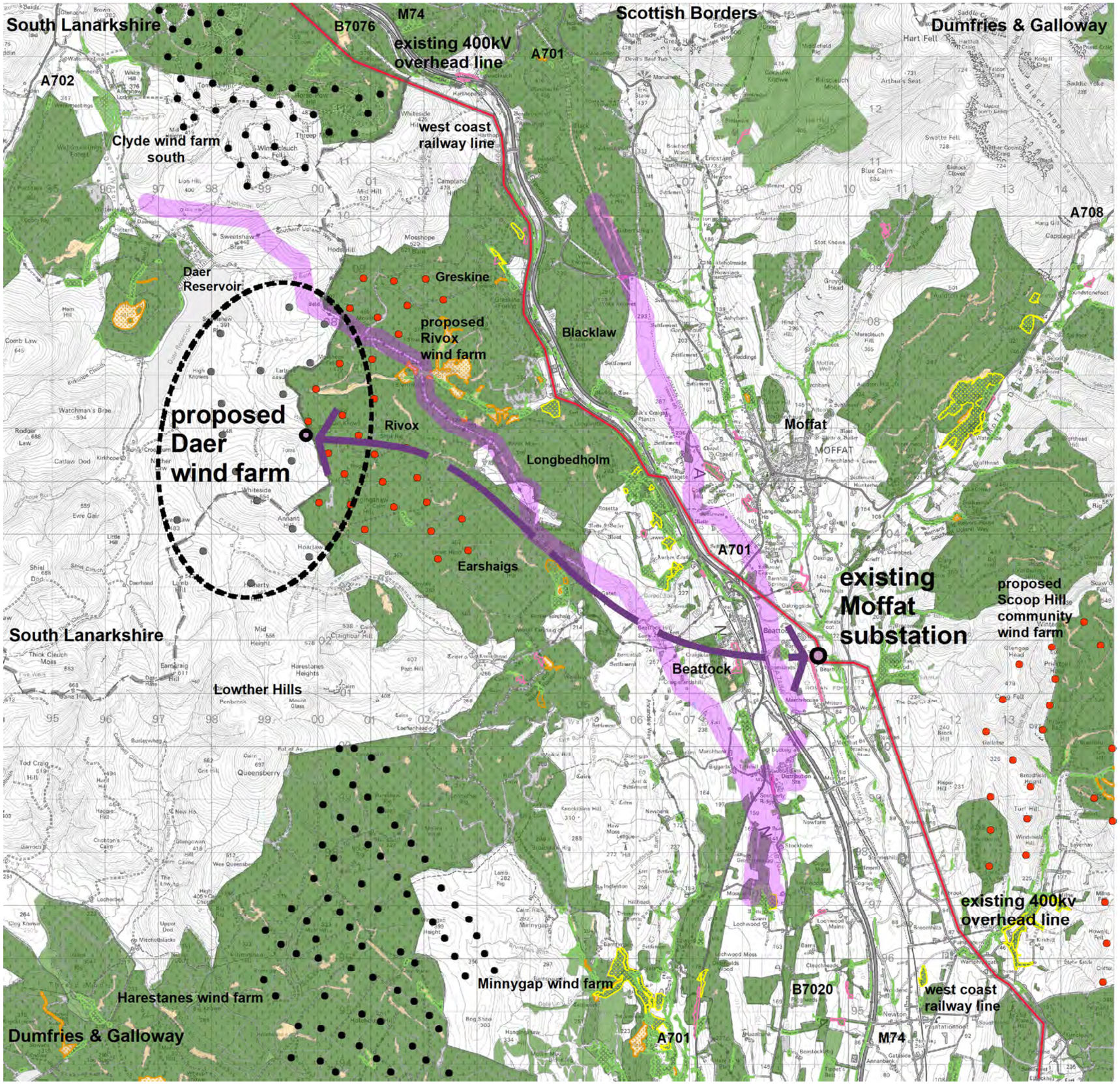
Landscape Architecture + Planning



Key:

Native Woodland Survey (Forestry Commision)

- Native Woodland
- Nearly-native Woodland
- Open Land Habitat
- Planted Areas of Woodland Scotland (PAWS)

National Forest Inventory

- Non Woodland
- Woodland

Infrastructure

- 400kV Overhead Line
- Gas/Oil Pipeline Buffer
- Wind Farm (Operational)
- Wind Farm (Proposed)

0 1 2 4km

figure 4.7

Title:

Commercial Forestry, Woodland & Infrastructure Information

Project:

Proposed 132kV Connection to Daer Wind Farm

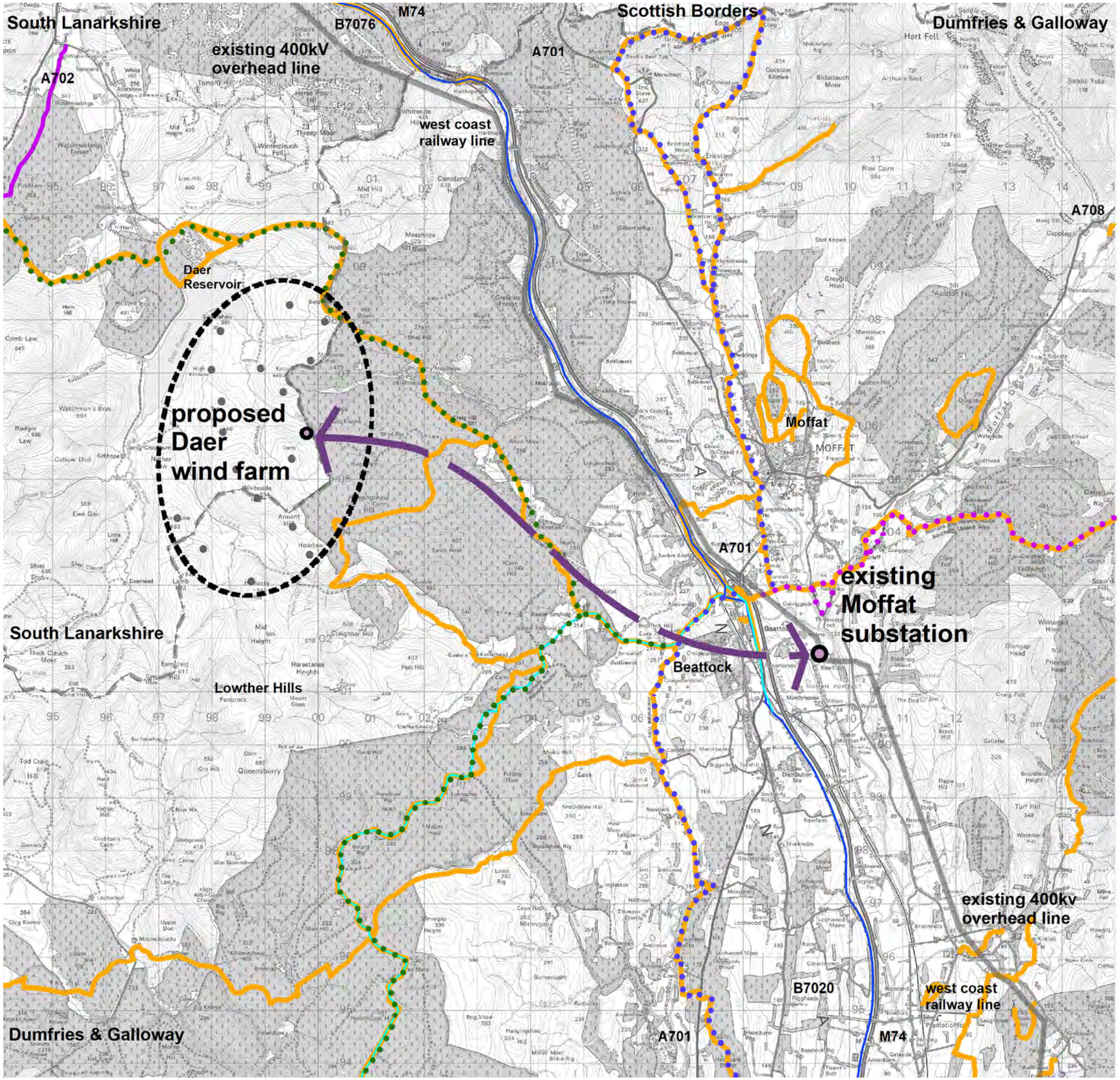
Project No:

Scale: 1:75,362 at A3
Other refer Bar Scale

Date: Feb 2024

SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning



Key:

- Southern Upland Way
- Annandale Way
- Romans & Reivers
- Core Path
- Aspirational Core Path
- National Cycle Route
- Local Cycle Route

Ordnance Survey Key:

Contours	Mast	Parking/Park & ride	
Landfill site	Wind turbine	Picnic site	
Woodland	Youth Hostel	Tourist interest	
Forestry Commission	Place of worship	Telephone, public	
Visitor centre	Camp site/Caravan	Viewpoint	
Nature reserve	Golf course	Walks/Trails	

0 1 2 4km

figure 4.8

Title:

Recreation Routes & Attractions

Project:

Proposed 132kV Connection to Daer Wind Farm

Project No:

Scale: 1:75,000 at A3
Other refer Bar Scale

Date: Feb 2024
SP Energy Networks

Environmental Designworks
Landscape Architecture + Planning

Identification of Route Options

5.1 Given the nature of overhead transmission lines the primary environmental effects are likely to be landscape and visual. The best way to limit adverse effects on landscape and visual amenity is by careful line routeing, led by landscape architects, based on professional judgement and informed by fieldwork.

5.2 Holford Rules 1 and 2, as described in **Chapter 3**, formed the basis for the landscape led identification of route options. In addition, Rules 4 and 5 of the Holford Rules identify the OHL infrastructure is judged to be more widely visible from surrounding areas when located on higher ground, for example ridges and skylines. Holford Rule 3 which states that, other things being equal, the most direct line should be chosen, with no sharp changes in direction, has also been taken account in identifying route options. The presence of residential properties within the Study Area also played a key role in identifying route options.

5.3 Desk review of environmental baseline data for the Study Area and technical constraints, followed by site visits, allowed the identification of a number of strategic route corridors between the proposed Daer wind farm development and underground cable connection points to the existing substation at Moffat. During this process a number of route options have been identified, reviewed, rejected or developed in the selection process.

5.4 The identified route options are indicated in **Figure 5.1** and following the routeing process, the current Preferred Route option is indicated in **Figure 5.2**.

5.5 In this routeing study, there are no “areas of highest environmental value” (Holford Rule 1) located within the Study Area, and therefore national level designations have not influenced this routeing process. The closest national level designation is a number of Scheduled Monuments. As noted in **Chapter 3**, and reflecting the Holford Rules, additional considerations can be introduced into the appraisal to help inform the selection of a Preferred Route option. These areas of “regional and local amenity value” may be of more local importance and smaller in scale. For this routeing study, the other areas which have been considered are shown on **Figures 4.1- 4.8** and include:

- Special Landscape Areas (Leadhills and Lowther) and Regional Scenic Areas (Thornhill and Moffat Hills)
- Scheduled Monuments and Listed Buildings
- Archaeologically Sensitive Areas
- Non Inventory Gardens and Designed Landscapes
- Areas of Ancient Woodland and Long Established Woodland as defined by the Ancient Woodland Inventory
- Areas of Native Woodland of Scotland (NWS) and Planted Ancient Woodland Sites (PAWS) as defined by the National Woodland Survey of Scotland;

5.6 The above designations have been treated as “avoid where possible” or where not possible “balance with other considerations”. The settlements of Beattock and Moffat are located within

the Study Area and residential properties have been treated as areas of highest environmental value to be avoided.

5.7 The existing carbon and peatland data, wetland inventory, existing watercourse and waterbodies, grid network, national gas and oil pipeline infrastructure, and proposed wind farm development have also been noted in the appraisal of route options. The angle of slope greater than 22 degrees has also been taken into consideration as this presents a technical challenge for the placement of wood poles in elevated areas (200m - 500m AOD)

5.8 At this project stage there has been no other committed developments identified within the Study Area in addition to the proposed Daer Wind Farm and Rivox Wind Energy Hub. Committed developments will be kept under review as these could present an environmental constraint to routeing and also a technical constraint due to requirement for separation distances etc.

Preliminary Environmental Review

5.9 The developed route options have been subjected to a preliminary environmental review, which is detailed in **Appendix 2**. This appraisal was undertaken qualitatively, employing specialist professional judgement drawing upon: knowledge of the Study Area at this stage; the baseline environmental information collated to date; and understanding of the potential environmental effects of overhead transmission lines.

5.10 The key environmental considerations used for the comparison of route options have been: -

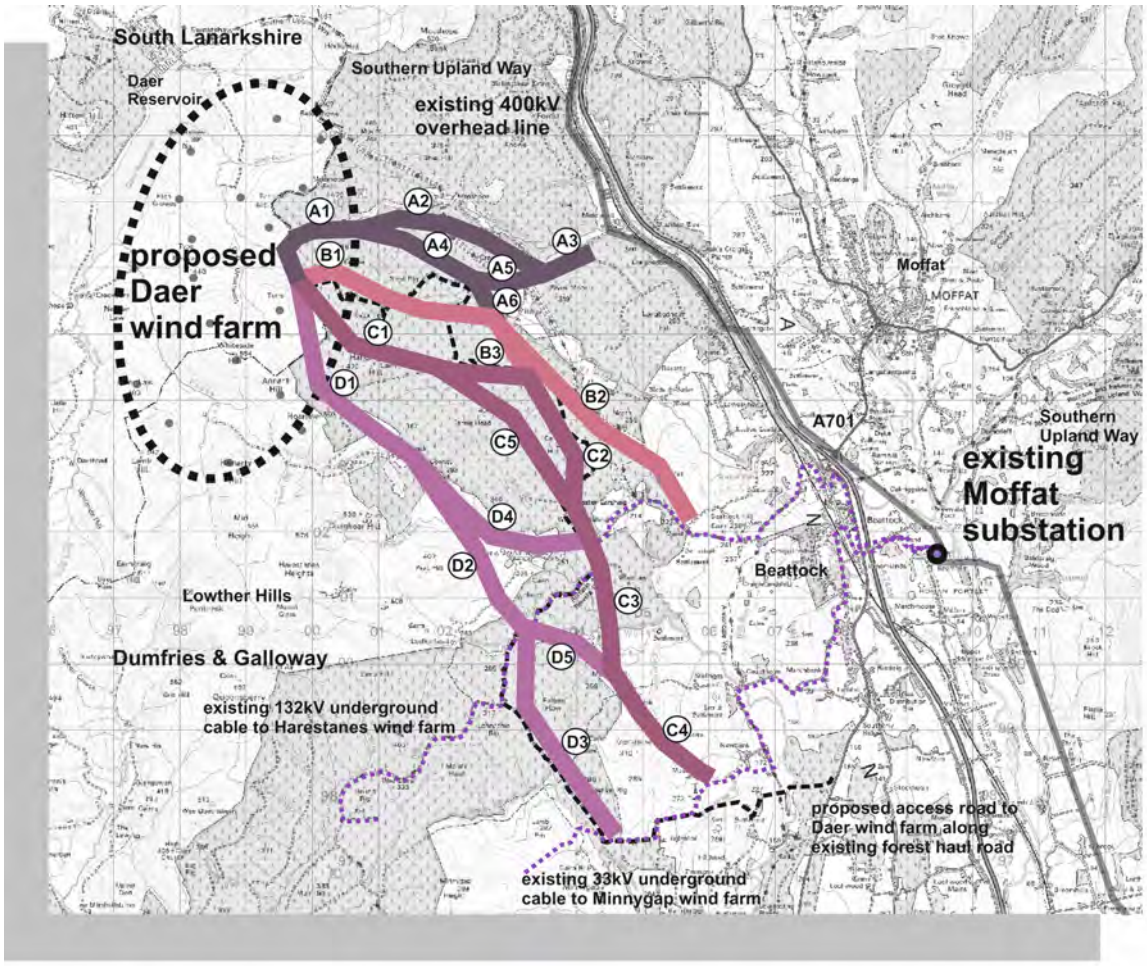
- Landscape: landform, landcover, landuse, designation, landscape character (NatureScot) and summary of effect.

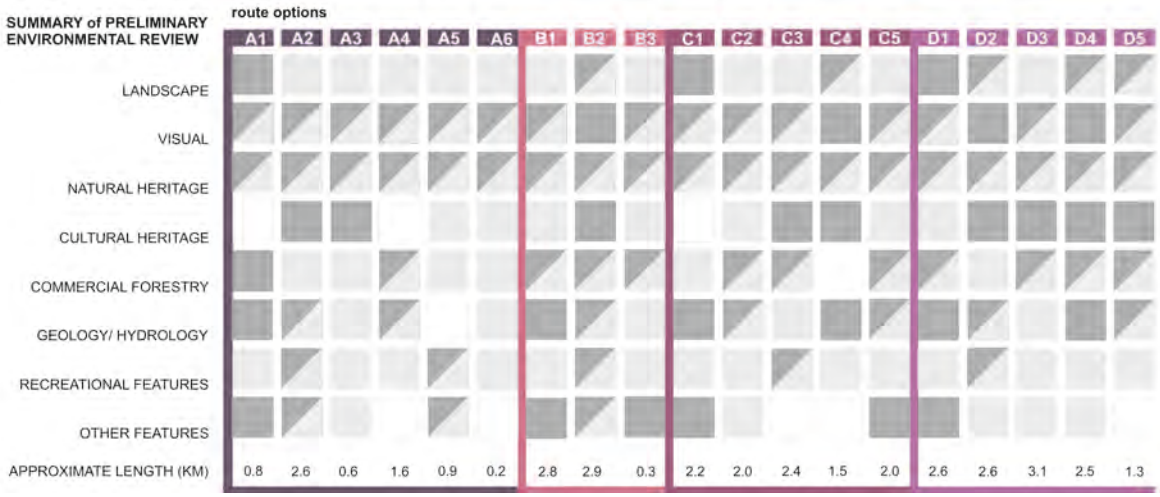
- Visual: visibility, receptor type and summary of effect.

- Protected Areas & Features: nature conservation, heritage, geology, hydrology, commercial forestry, recreational attractions/ routes, national infrastructure and any other important features, which in this Study Area has included commercial forestry.

5.11 **Table 2** summarises the findings of the Preliminary Environmental Review of the route options as a simple matrix, which provides a preliminary ranking of the potential effect of each route option. This allows recording of the comparative assessment of route options undertaken at this project stage. The Table is supported by the following text, which explains the key differences between the route options leading to the identification of the Preferred Route.

Table 2: Summary of Preliminary Environmental Review of Route Options





Landscape Character

5.12 All Routes pass through areas of similar landform, landcover and landuse to reach Moffat Substation. To the west this is an elevated remote large scale upland area of smooth rounded hills encompassed by large scale commercial forestry.

5.13 The proposed Daer wind farm is located on a hillside of open, rough grassland and moorland containing the eastern side of Daer reservoir. This area is used for rough grazing and to the north is the wind farm of Clyde South. Daer reservoir is used for water supply, power generation, and recreational fishing. The area is encompassed by the Leadhills and Lowther Special Landscape Area and Thornhills Regional Scenic Area. Routes A1, C1 and D1 all pass through the eastern edge of the Leadhills and Lowther Special Landscape Area (SLA).

5.14 The hilltops are encompassed by commercial plantations which extends across the sloping ground eastwards. This landuse creates a managed patchwork of uniform enclosed areas of coniferous trees and felled areas. Within the forest, open areas such as along watercourses and farmland create interest due to the contrasting diversity of colour and texture.

5.15 Routes A, B and C are aligned across the extensive commercial plantation encompassing the area of high altitude to the west of the Study Area. Route D passes through an area of forestry and is then aligned along the open elevated valley of Kinnelhead before passing through another area of plantation (Routes D2 and D4).

5.16 Routes B2 and C4 both cross a distinct elevated area of undulating foothills to the west of Beattock. This open grassland area has a cohesive and distinct attractive landscape character separate from the settled busy Annandale valley to the east and remote elevated upland to the west.

Visual Effect

5.17 Partial and glimpse views would be afforded of all route options. This would encompass primarily recreational users of the forest and workers.

5.18 Partial and glimpse views maybe afforded by recreational users of route options A1, C1 and D1 crossing the open elevated ground on exiting the Daer Wind Farm Substation. It is considered these views will be limited by the intervening topography and will be primarily viewed in the context of the proposed Daer Wind Farm.

5.19 Views of the route options passing through the coniferous forest will be limited by adjacent planting, but will continually change over time due to the crop cycle of planting, thinning and felling. Partial views will be afforded of route options B2, C4, D2 and D4 crossing open grassland by residential and recreational users. Partial and glimpse views maybe afforded of route option A2, A5 and A6 by residential receptors.

5.20 Limited partial and glimpse views will be afforded of route options A2, A5, B2, C3 and D2 crossing the Southern Upland Way, and Roman and Reivers Route. Partial views would also be afforded from the Southern Upland Way aligned along the Crooked Road and Annandale Way of route option B2. Partial views would be afforded of route option C4 from the Annandale Way.

Protected Areas & Features

Nature Conservation

5.21 None of the route options cross sites that have been designated for their international or national ecological interest. All of the route options head away from Shiel Dod SSSI, the nearest part of which is located approximately 3.4 km to the west of the proposed Daer wind farm substation. No impacts are likely on this designated site and its associated interest features due to the large separation distance.

5.22 Lochwood SSSI is located approximately 3.5 km to the east of the southern end of route D3 and 2.2 km to the south-east of the southern end of route C4. These are the closest points of any of the route options to the designated site. No impacts are likely on this designated site and its associated interest features due to the large separation distance.

5.23 Routes B2, C1, C3, C4, D1, D2 and D4 all include sections that appear to cross open moorland. It is possible that these moorland areas include some of the NVC communities identified by surveys carried out for the proposed Daer Wind Farm and the Rivox Wind Energy Hub, including blanket mire, acid flush, wet heath, dry heath and acid grassland. GWDTEs may also be present. These habitats may also be present along rides and fire breaks within forestry areas, which are features that may be utilised by some of the route options.

5.24 All routes pass close to and/or cross watercourses and so there is the potential for disturbance of nesting birds that use the watercourse corridor, as well as riparian species such as otter, water vole and aquatic species such as Atlantic salmon, brown trout, river lamprey and brook lamprey.

5.25 All routes pass through or close to areas of forestry, which may support populations of red squirrel, badger, pine marten and roosting and/or foraging bats. This habitat may also support nesting birds, including raptors such as goshawk.

Cultural Heritage

5.26 An overhead line along any combination of alignments through Route A1 to A3 (A1, A2, A3 or A1, A4, A5, A3) has a low likelihood of resulting in significant (and unacceptable) adverse effects on cultural heritage. The route options pass through commercial forestry and intersect (along option A3) with two areas of known archaeological remains relating to post-medieval settlement and farming along the Cloffin Burn. There are no designated heritage assets along this route likely to receive any adverse impacts on their settings.

5.27 An overhead line along route options B1 to B2 has a low to moderate likelihood of resulting in significant (but not necessarily unacceptable) adverse effects on cultural heritage. The route options pass through commercial forestry and intersect (along option B2) with an area of settlement and farming activity of Early Bronze Age to 19th century date on Gatet Hill. The demarcated extent of the remains recorded in the DGC HER extends across most of the route corridor where it crosses open moorland between Neath Hill and Gatet Hill on the southwest side of the Garpol Water. This OHL route option also terminates close to the Beattock Archaeological Sensitive Area (ASA), an area of archaeological remains on Beattock Hill designated by DGC as being of regional importance. The route terminates close to the Scheduled Monument, Stanshielrig, homestead, enclosures, field systems & clearance cairns (SM 4057), an area of prehistoric settlement and farming. The OHL termination and sealing end compound could adversely affect the baseline setting of this Scheduled Monument.

5.28 An overhead line along any combination of alignments through Route C1 to C4 (C1, C2, C3, C4 or C1, C5, C3, C4) has a low to moderate likelihood of resulting in significant (but not necessarily unacceptable) adverse effects on cultural heritage. The route options pass through commercial forestry and intersect (along option C3) with several areas of recorded archaeological remains ranging in date from the Early Bronze Age to the 19th century. A notable concentration lies at the southern end of C3, in open moorland along the western edge of the Beattock ASA. The southern end of this route (C4) terminates close to the Plewlands Burn, where there is a group of three Scheduled Monuments in close proximity in elevated positions overlooking the watercourse. The group comprises a hillfort and two scooped settlements of likely late Iron Age and Romano-British date. The OHL termination and sealing end compound could adversely affect the baseline setting of these Scheduled Monuments.

5.29 An overhead line along any combination of alignments through Route D1 to D3 has a low to moderate likelihood of resulting in significant (but not necessarily unacceptable) adverse effects on cultural heritage. The route options pass through commercial forestry (in options D1 and D3) and through open moorland west of Kinnelhead in option D2. Through D2 the route option includes three Scheduled Monuments: Kinnelhead Tower, fortified farmstead & cross incised stones (SM 8610); Kinnelhead Cottage, building 285m SSW of (SM 12615); and Kinnelhead Cottage, cairn 540m S of (SM 12655). A route through the open moorland west of Kinnelhead has some potential to result in adverse impacts on the settings of these Scheduled Monuments (remains of a medieval tower house and medieval farmhouse and a Bronze Age burial cairn). The route of D2 also passes through several discrete areas of archaeological remains of settlement and farming dating from the Early Bronze Age to the 19th century between Threepen Burn and Lochan Burn.

5.30 The deviation option from Route D to Route C (sections D5 and C4) has a moderate likelihood of resulting in significant (but not necessarily unacceptable) adverse effects on cultural heritage. The route options pass commercial forestry (in option D5) and through open moorland in option C4. Where the two options meet, on open moorland on Meikle Hill, the route passes through several areas of recorded archaeological remains ranging in date from the Early Bronze Age to the 19th century, in open moorland along the western edge of the Beattock ASA.

5.31 On current evidence, based on analysis of existing records, the most favourable route options with specific reference to cultural heritage are: A1, A4, A5, A3; or D1, D2, D3. Overall, option A1, A4, A5, A3 would be preferred over D1, D2, D3 as the latter would be likely to have more adverse effects on designated heritage assets (Scheduled Monuments around Kinnelhead). However, in each case, an alignment could be designed that would avoid significant effects on the character or setting of the cultural heritage assets along the route corridor.

Hydrology/ Hydrogeology

5.32 At this stage, the main geological, hydrological or hydrogeological features of interest with respect to route selection located within the route corridors are considered to be:

- the peat/priority peatland habitats
- wetland areas (including potential GWDTE)
- water supplies; and
- areas at risk of flooding.

5.33 Based on the sources of peat mapping (BGS 1:50,000 scale, 2022; and Scotland's Soils, 2022), there are potential areas of peat and/or peat soils along parts of Routes A1, A2, A4, B1, B2, C1, C2, C4, C5, D1, D3, and D5. An area of Class 1 priority peatland (Scotland's Soils, 2022) has been identified at/near the start of route corridor A1.

5.34 Wetland areas (i.e. wet grassland, peat bog or non-specific wetland as mapped on the Scottish Wetland Inventory) are present along Routes A1, B1, C1 and D1. Route B1 has the shortest distance across mapped wetland.

5.35 Some potential GWDTE have been identified to the immediate west and north of the start of Routes A1, B1, C1 and D1 within the baseline study area of the proposed Daer Wind Farm (Natural Power 2020/2021). The work that has been undertaken with respect to the proposed Daer Wind Farm development suggests the potential GWDTE are mainly rainfall fed, but some could have input components from groundwater. Given the presence of mapped peat and wetlands in the area of Routes A1, B1, C1 and D1, it is considered likely that potential GWDTE may also be present. Further ecological and hydrogeological input would be required to confirm.

5.36 Based on freely available Ordnance Survey watercourse mapping and aerial imagery, Routes A2 and A4 may cross the Brattle Burn, which is a tributary in the upper reaches of the Cloffin Burn. Routes A5, B2, B3, C2 and C5 may cross the upper reaches of Garpol Water or its tributary the Rivox Burn. Routes A1, B1, C1 and D1 may cross watercourses that flow into Daer Reservoir. Route B1 may also cross the upper reaches of Coalpit Burn, which is a tributary of the Rivox Burn and Garpol Water. Route D2 may cross Kinnel Water and its tributary, Threepen Burn. Routes C3 and D4 may also cross Kinnel Water, and Routes D3 and D5 may cross another of its tributaries the Lochan Burn. Ground truthing would be required to confirm this because watercourses may extend further than shown on the mapping and imagery used. Other minor watercourses and drainage channels not shown on the mapping may also be crossed by the proposed routes and a water crossing survey would be required to confirm this.

5.37 All classified surface water bodies have 'good' or 'high' water quality status. Deterioration of this should be prevented. Any 'poor' classifications relate to invasive species, or man-made barriers to fish migration in the case of the Cloffin Burn and Kinnel Water. Such barriers may also have resulted in watercourse flow being modified. There are improvement objectives for associated waterbodies with a less than 'good' status.

5.38 With respect to groundwater Water Framework Directive (WFD) status, Routes A1, B1, C1 and D1 all have their start on land overlying the Leadhills groundwater body, which is currently classified as having 'poor' quality status. There are WFD water quality improvement objectives for associated waterbodies with a less than 'good' status.

5.39 Water quality protection will be important for all routes to reduce the potential for water quality decline. This includes watercourses close to proposed route options, as well as those crossed by routes, and those where associated infrastructure such as tracks and compounds will be located. The most sensitive water features will be those that provide water supplies (i.e. Routes B1, C1 and D1 that may cross watercourses that flow into Daer Reservoir, and any supplies that are identified through future work as having a potential source-pathway-receptor pollutant linkage involving the proposed development).

5.40 Flood risk from rivers is mapped along the Cloffin Burn near Routes A2 and A3, but the mapped areas of flood risk are limited to the watercourse and land immediately adjacent, so may not extend to the Routes. Flood risk from rivers is mapped along Garpol Water where Routes B2 and B3 cross it. Flood risk from rivers is mapped along Kinnel Water where Routes D2 and D4 cross it; particularly the area of Kinnelhead Cottage where Route D4 passes. Flood risk from rivers is also mapped where Routes C3, D3 and D5 cross the Lochan Burn.

5.41 The localised areas of flood risk from surface water are too small to comment on at this project stage. However, many are associated with the upper reaches of watercourses, so where any route crosses a watercourse, the risk of flooding should also be considered.

5.42 There are likely to be private water supplies located in the area that are considered to be important water receptors, their presence will be confirmed by consulting with Dumfries and Galloway Council and South Lanarkshire Council at a later project stage.

5.43 All routes have some kind of geological/hydrological constraint before accounting for GWDTE and private water supplies (the presence of which have yet to be confirmed). Peat/wetlands may be present along the initial sections of all route options, whilst flood risk at crossing locations is more common towards the ends of the routes options. There is little difference between the possible route combinations. All have potential effects with similar ranges of significance. Minor changes to the alignment or other mitigation will be required to avoid or reduce the potential effects on geological/hydrological features.

5.44 The presence of peat, peat soils and/or wetlands are likely to represent the greatest geological/hydrological constraints. The route combinations that appear to cross the least distance of wetlands (Scottish Wetland Inventory) and peat (based on the combined mapping of peat from the BGS 1:50,000 scale superficial deposits, Scotland's Soils and Carbon Peatland 2016) are A1-A2-A3, B1-B2 and D1-D2-D3.

Commercial Forestry

5.45 All routes exiting the proposed Daer Wind Farm Substation will pass through commercial forestry plantation, which is covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. The forest is in the production phase with rotational felling and restocking underway.

5.46 Felling will be required to accommodate the proposed grid connection and as a result, there will be some woodland loss. Preliminary review of route options and the LMP has identified that route option A1 would pass through a "nature reserve" where nature conservation and biodiversity is the highest priority. A number of route options pass through "minimum intervention areas" which are areas identified for future broadleaved planting. Route options A1 and D1 pass along the western edge of Rivox and Earshaig Forests where the LMP indicates black grouse habitat has been created.

5.47 It is considered that commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a wind farm or other development. The LMP will require to be reviewed and amended to allow for the proposed grid connection and

associated wayleave, and potential compensatory planting integrated into the overall forest redesign.

Recreation features/ routes

5.48 The main visitor attractions in the Study Area are located in and around the settlements of Moffat and Beattock. Recreation in the forest and upland area is primarily associated with walking and cycling. All route options cross or pass near to such attractions in the Study Area.

Other Features

5.49 A national gas pipeline crosses the Study Area and will be crossed by route options A2 and A5. Route option B2 parallels the pipeline along a section, which also follows the route of the Southern Upland Way.

5.50 All route options (A1, B1, C1 and D1) are aligned through the proposed Rivox Wind Energy Hub development.

Preferred Route Alignment

5.51 The Preferred Route as indicated in **Figure 5.2**, is considered at this project stage to have on balance the least likely adverse environmental effects, whilst being technically feasible and economically viable. The approximate length of the Preferred Route OHL alignment between the proposed Daer Wind Farm and Moffat Substation comprising of Route Options B1 (as amended), A5 and A3 is 4.2 km. The total length of this new 132kV grid connection to Moffat Substation is approximately 10 km.

5.52 From the proposed Daer wind farm substation, the Preferred Route at this project stage seeks to minimise adverse environmental effects through the following routeing:

Preferred Route B1 (as amended), A5, and A3

Route B1 (amended)

- The route exits the proposed Daer Wind Farm Substation directly eastwards to enter Rivox commercial forest plantation and parallel part of the proposed Access Road. This alignment minimises the extent of the proposed grid connection in the designated Leadhills and Lowther Special Landscape Area (SLA). The alignment then passes between Gill Knowe and Rivox Fell ridge of hilltops. Route option B1 is then amended and routed to the north east to descend the hillside to link with Route Option A5.

- The alternative route option A1 initially identified for detailed review was rejected as the alignment along the eastern edge of Leadhills and Lowther SLA would cross peatland and within the forest, cross an area identified by FLS as a “natural area” (FLS, 2017) and the steep northern slope of Gill Knowe. The amended route option of B1/A5 also avoids areas of “minimum intervention” identified in the LMP. It is envisaged that the hill top coup could be redesigned to accommodate the proposed development whilst adhering to the LMP forest design aims to ensure the shape is both wind firm and fits with the landscape.

Route A5

- The route then passes along the lower slopes of Craig Hill which forms backgrounding to views afforded from the south. The route then passes between Craig Hill and Rivox Moor in a north

east direction crossing the Southern Upland Way, national gas pipeline and access road to Rivox farmhouse.

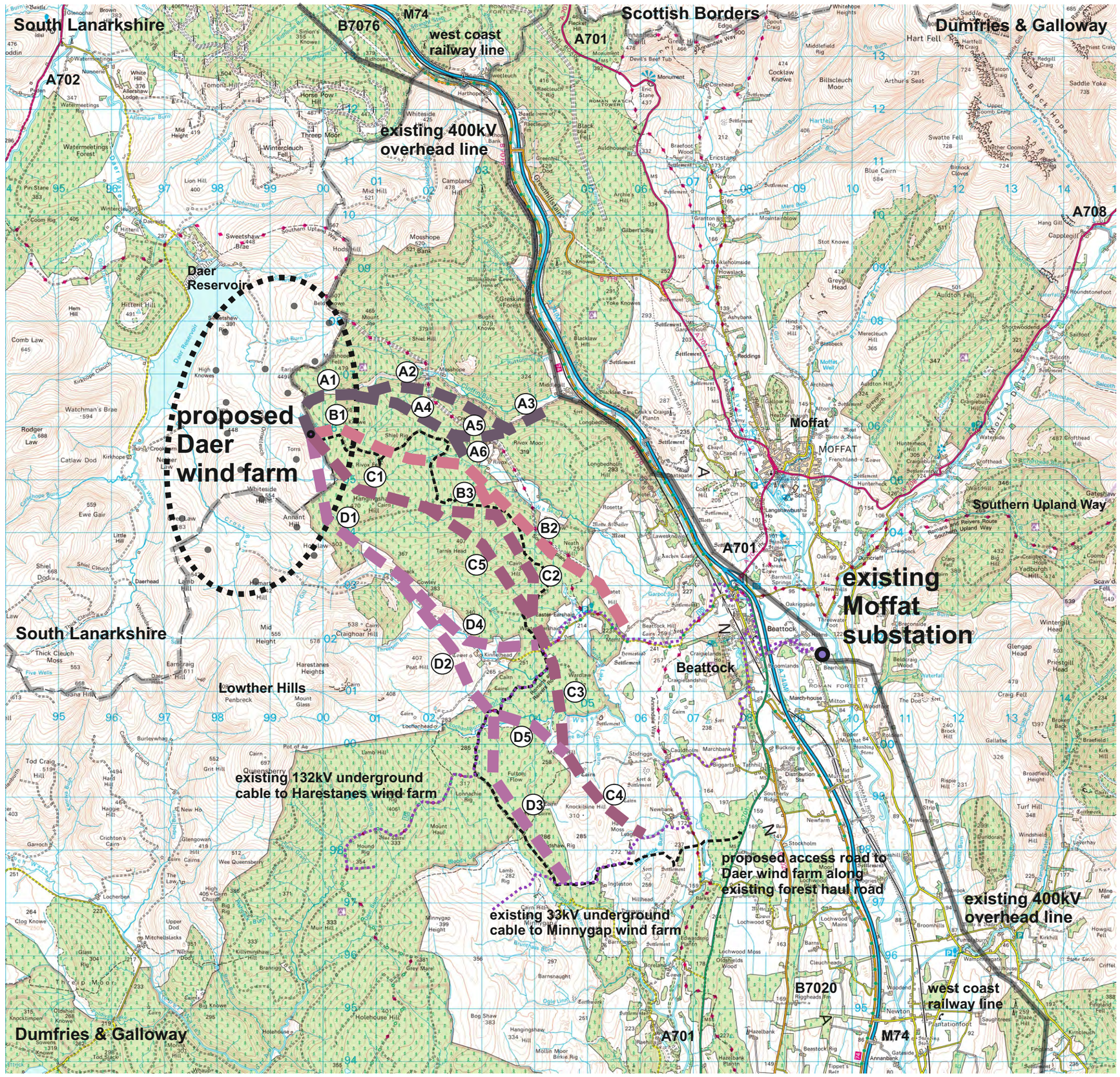
Route A3

- The route passes north eastwards and is aligned to the south of the existing access road to the properties of Rivox, Mosshope (unoccupied) and Brattleburn (unoccupied). The route would cross an existing forest track leading to Longbedholm commercial forest plantation and then terminate. To the east, the area of "minimum intervention" and proposed mixed broadleaved tree planting around Middlegill Fort identified in the LMP (2017) would be safeguarded

- From this point an underground cable will be aligned along the access road under the existing 400KV overhead line and railway to the B7076. This access road is aligned adjacent the residential properties of Cloffinburn, Cloffin Cottage and Middlegill.

5.53 At this project stage, the Preferred Route should be viewed as a **corridor** within which the detailed route alignment can be developed through localised deviations to avoid or reduce identified effects during the detailed environmental assessment process. A preliminary list of potential effects of the proposed development on the environment, proposed desk and field surveys, and draft mitigation measures are listed in **Appendices 3, 4 and 5.**

5.54 **Chapter 6** outlines how the Preferred Route will become the Proposed Route through the consultation process.



Key

A B C D

Strategic OHL route options for the Proposed Daer 132kV Connection

0 1 2 3 4km

figure 5.1

Title:
Strategic Route Options

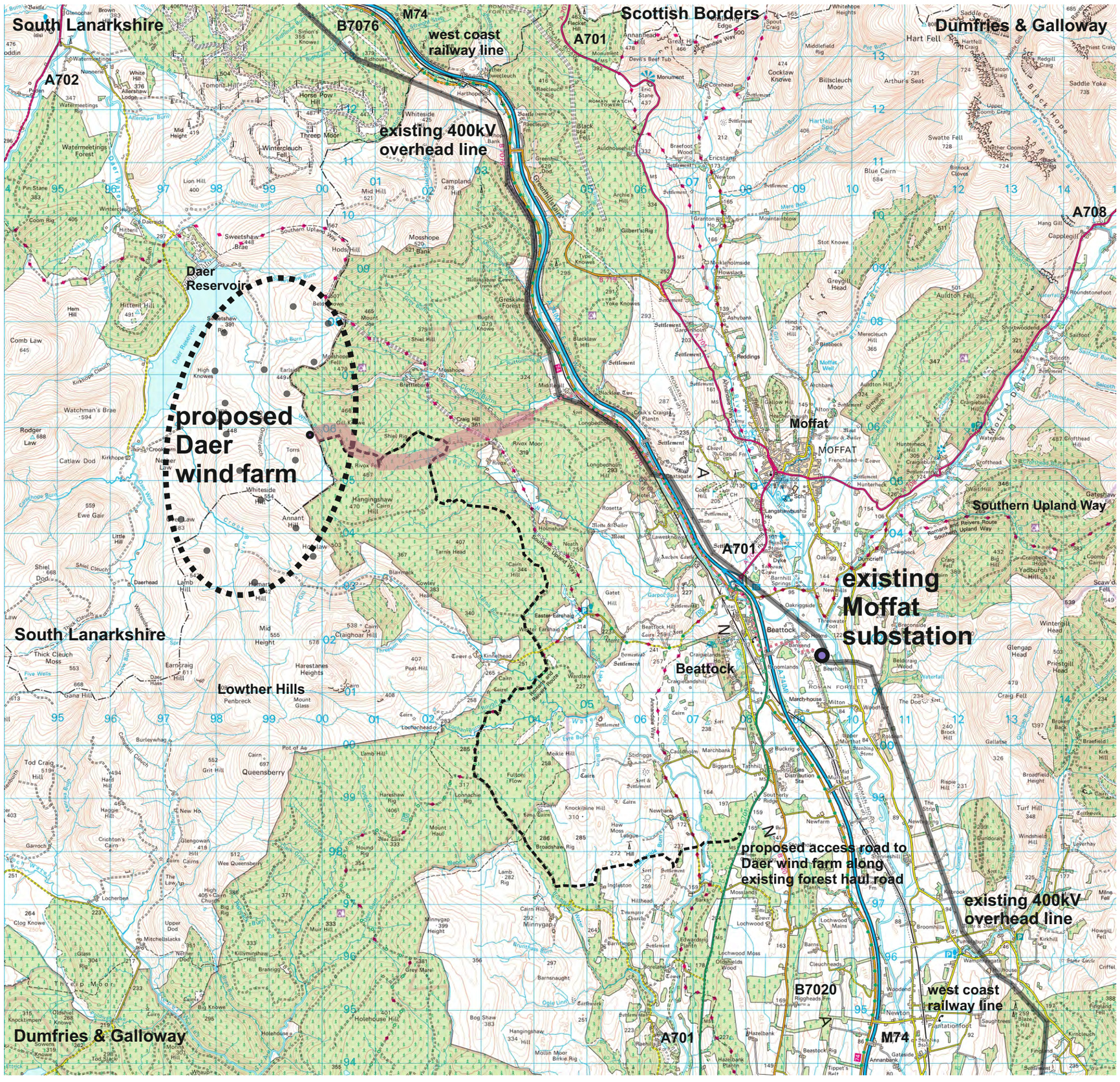
Project:
Proposed 132kV Connection to Daer Wind Farm

Scale: 1:75,000 @A3 / Bar Scale

Date: Feb 2024

SP EnergyNetworks

Environmental Designworks
Landscape Architecture + Planning



Key

Draft Preferred Route Corridor (300m width) Strategic Route **B1** (Amended), **A5** & **A3**

Draft Underground Connection Route along B7076 & following Harestanes U/G Route to Moffat Substation

0 1 2 3 4km

figure 5.2

Title:
Preferred Route

Project:
Proposed 132kV Connection to Daer Wind Farm

Scale: 1:75,000 @A3 / Bar Scale

Date: Feb 2024

SP EnergyNetworks

Environmental Designworks
Landscape Architecture + Planning

Approach

6.1 The objective of the appraisal of the route options is to identify in a comparable, documented and transparent way an overall Preferred Route option. As outlined in the Routeing Strategy, professional judgement, informed by both desk studies and fieldwork, and reflecting the Holford Rules (as clarified in **Appendix 1**) has been employed in this iterative process.

6.2 The process also sought to:

- reflect the overall Routeing Objective and Routeing Strategy;
- reflect SPEN's Approach to Routeing and Environmental Impact Assessment;
- reflect the Holford Rules for Routeing;
- draw out distinctions between the routes to enable the relative strengths and weaknesses of each to be identified.

6.3 The comparative appraisal of route options was undertaken in stages as set out below:
(i) identification of appraisal criteria, together with reasoning for inclusion;
(ii) application of appraisal criteria to each route option, following the appraisal methodology;
(iii) comparative appraisal of route options to identify a Preferred Route;
(IV) SPEN technical review, reflecting system design requirements;
(v) cumulative appraisal with other overhead line connections within the Study Area.

Appraisal Criteria

6.4 Based on the established practice for overhead line routeing and the routeing considerations for the project, the route options were appraised using the following criteria, which continue to reflect the key considerations of the routeing methodology;

- landscape and visual amenity;
- nature conservation;
- cultural heritage;
- geology and hydrology (flood risk);
- forestry;
- recreation; and
- other features.

Appraisal Findings

6.5 The emerging Preferred Route for the 132kV OHL from the proposed Daer Wind farm Substation is aligned directly eastwards between Gill Knowe and Rivox Fell descending though the commercial plantation of Rivox towards Middlegill. The overhead line would terminate to the west of the existing 400kV overhead line, railway line and residential properties in this area. From this point an underground cable would follow the alignment of the B7076 and A701 to provide a grid connection to Moffat Substation. The total length of this new 132kV grid connection is approximately 10 km.

6.6 The detailed environmental appraisal findings to identify the Preferred Route option are included in **Appendix 2**.

Technical Review of Emerging Preferred Route Option

6.7 Following the environmental appraisal of options, the emerging Preferred Route has been reviewed by SPEN in relation to the system and network design requirements. This review has been undertaken to ensure that, based on the level of detail available, the Preferred Route is within the technical parameters required to construct overhead lines. This has included consideration of the following matters:

- Altitude;
- Topography (particularly slopes greater than 22 degrees however, slopes that were not greater than 22 degrees but steep in nature were also considered as these could be less favourable for routeing);
- Buildability /Access constraints (including restrictive roads and forestry access tracks);
- Crossing /Proximity to existing OHL transmission and distribution infrastructure (including the existing 400kV OHL);
- Mineworking areas (opencast etc);
- Ground Conditions (including peat);
- Public Service utilities (crossings/ proximity) (including major pipelines);
- Watercourse/ Catchment area crossings (i.e Rivers, Lochs and Reservoir);
- Road/ railways crossings along corridor;
- Wind farms (existing and future developments);
- Residential/ Industrial areas;
- Pollution (consideration of corrosion rates); and
- Forestry.

6.8 To inform the technical review, a specific risk rating (high, medium, or low) was allocated to each parameter by SPENs technical team. The technical review of the above considerations has highlighted that a series of mitigating factors will be required with specific reference to:

- Proposed Rivox Wind Energy Hub turbines and borrow pits;
- National Gas Pipeline crossing;
- Altitude and topography;
- Forest felling;

6.9 At this project stage, the technical review has confirmed the emerging Preferred Route can be progressed to the Cumulative Appraisal as outlined below and Consultation Stage.

Consideration of Cumulative Effects of Emerging Route Option Preferences

6.10 As set out in **Chapter 3**, the routeing process takes account of other OHL connections which are located within the Study Area. When considering more than one project, combined (or cumulative) effects can arise from the concentration of effects in one area or the distribution of effects across a wider area. It is therefore necessary to find an appropriate balance using professional judgement and experience.

6.11 The existing 400kV Scotland – England Interconnector crosses the Study Area from the north-west to south east. The other existing overhead line connections considered in the cumulative appraisal is the 11kV local distribution network.

6.12 Other existing grid connections in the Study Area are underground and are considered unlikely to result in any operational cumulative interactions.

6.13 Following technical confirmation of the emerging route preference, an environmental review has been undertaken to consider the existing overhead lines in combination with the emerging Preferred Route Option.

6.14 The emerging Preferred Route will be aligned from a point approximately 250m west of the existing 400kV OHL. The terminal wood pole would be located to the south of the existing access road and separated from the existing overhead line by adjacent woodland. At this project stage cumulative interactions between the Preferred Route and existing OHL are considered to be limited to the immediate local area.

6.15 Overall, there will be no likely significant cumulative effects which will prevent the emerging Preferred Route Option from being progressed further. Cumulative grid connection effects will, however continue to be considered, and assessed where appropriate, throughout the detailed alignment and environmental assessment stage.

Conclusion

6.16 In accordance with the overarching routeing process, the selection of the Preferred Route primarily reflects the findings of the landscape and visual appraisal, and aims to avoid the areas of highest amenity value from the outset. This is on the basis that the routeing stage comprises the most effective way of avoiding and/ or minimising potential landscape and visual effects, whereas effects on other environmental characteristics, such as cultural heritage can more readily be avoided/ minimised during the route alignment stage (and potentially through adoption of mitigation measures).

6.17 On this basis, the environmental and technical appraisal undertaken as part of the routeing process has identified a continuous 132kV overhead route, which meets the project Routeing Objective. The Preferred Route is shown in **Figure 5.2.**

6.18 Due to technical constraints associated with crossing the railway line and motorway the overhead line will be terminated to the west of Middlegill. An underground cable will then be aligned along the minor access road under the railway and along the B7076 /A701 to allow the grid connection to enter Moffat Substation.

6.19 The Preferred Route, along with the alternative route options considered, form the basis of this stage of consultation with stakeholders and the public. Further details in relation to the consultation process are provided in **Chapter 7**.

Consultation Process

7.1 As set out in **Chapter 1.0**, SPEN will apply to Scottish Ministers for consent for the proposed 132kV overhead line to connect the proposed Daer Wind Farm under Section 37 of the Electricity Act 1989. SPEN will also apply for deemed planning permission for the grid connection and associated works under Section 57(2) of the Town and Country Planning (Scotland) Act 1997.

7.2 The majority of the underground cable is located in the public highway. This falls within the scope of the New Roads and Streetworks Act 1991. Cabling works will require pre- notification to the Road Works Authority.

7.3 While there are no formal pre- application requirements for consultation in seeking Section 37 consent/ deemed planning permission, SPEN is following best practice as outlined in the Scottish Government Energy Consents Unit Good Best Practice Guidance (2022). This guidance encourages applicants to engage with stakeholders and the public in order to develop their proposals in advance of such applications being made.

7.4 Therefore, prior to submission, SPEN is actively carrying out consultation with the public and stakeholders to inform the project and proposed grid connection at this early stage.

7.5 Following the submission of an application for Section 37 consent and deemed planning permission, the Scottish Government Energy Consents Unit, will, on behalf of Scottish Ministers, carry out further consultation with the public and stakeholders, including South Lanarkshire, and Dumfries and Galloway Councils, before making a decision on whether to grant consent.

Consultation Strategy

7.6 SPEN attaches great importance to the effect transmission development may have on the environment and local communities and is very keen to hear the views of local people and stakeholders to help it develop the Daer 132kV Connection Project in the best way.

7.7 The overall objective of the consultation process is to ensure that all parties with an interest in the Daer 132kV Connection Project continue to have access to up to date information and are given clear and easy ways in which to shape and inform SPENs proposal at the pre application stage. In addition, it is envisaged that the key issues identified through this process can be recorded and presented to decision makers in order to assist the consents process.

<u>Consultees</u>

7.8 SPEN wishes to consult with relevant stakeholders and gain their view on the Preferred Route identified for the Daer 132kV Connection Project. The consultation will seek to gain views from the following:

- landowners, local residents, businesses and the public;
- statutory and non - statutory consultees;
- Community Councils -Crawford and Elvanfoot, Moffat and District; Kirkpatrick and Juxta; and Johnstonebridge and Kirkmichael; and

- elected members of the South Lanarkshire and Dumfries and Galloway Council areas, the Members of Parliament (MP) and Members of the Scottish Parliament (MSP) whose constituencies are within the Study Area.

The Focus of the Consultation

7.9 This Report presents the findings of the initial phase the Daer 132kV Connection Project, the routeing process, resulting in the identification of a Preferred Route.

7.10 The focus of the consultation will be to ask for views on:

- the Preferred Route;
- the alternative route options considered during the routeing process;
- any other issues, suggestions or feedback; particularly views and information about the local area, for example recreational use, local environmental features, attractions and any other proposed development along the Preferred Route.

Consultation Launch and Duration

7.11 The consultation period will run for a period of four weeks and the information will be available online from **Monday 26th February 2024** to **Sunday 24th March 2024.**

7.12 Prior to the consultation period, adverts will appear in the local weekly newspapers The Annandale Herald and Moffat News, and Carluke and Lanark Gazette at least 7 days prior to the Consultation launch providing information on the project. This will also confirm that comments received at this stage are informal comments to SPEN, and the opportunity to comment formally to the ECU will be available once an Application has been submitted.

Sources of Information about the Consultation

7.13 To give statutory consultees, interested stakeholders and the public an understanding of the proposed development and seek comment regarding the Preferred Route, this Routeing and Consultation Document will be available to view/ download on the SPEN website:

https://www.spenergynetworks.co.uk/pages/community_consultation.aspx

7.14 Copies of the Routeing and Consultation Document will also be placed at the following locations:

Dumfries and Galloway Planning Department, Kirkbank House, English Street, Dumfries, DG1 2HS.

South Lanarkshire Planning Department, Floor 6 Council Offices, Almada Street, Hamilton, ML3 0AA

Moffat Library - High Street, Moffat, DG10 9HF

Lesmahagow Library- 48 Abbeygreen, Lesmahagow, ML11 OEF

7.15 A Public Exhibition will be held on **Monday 26th February 2024 between 3pm- 8pm in Moffat Town Hall, High Street, Moffat DG10 9HF.** This location has been chosen so that the majority of people near the proposed development are only a short distance from the consultation event

by car or public transport. Representatives from SPEN and their consultants will be available at the Exhibitions to discuss the Project as a whole or any specific elements.

How to Submit a Comment or Discuss the Project

7.16 If you wish to make any comments on this proposal you can do so by contacting us at the following email or postal address no later than **Sunday 24th March 2024.**
daerwfconnection@spenergynetworks.co.uk

or by writing to:
Daer Environmental Planner, Alan Graham, **SPEN Environmental Planning, 55 Fullarton Drive, Glasgow G32 8FA.**

7.17 You can also call the **SPEN Community Liaison Team** during the consultation period on **07516 461129**

7.18 In summary there are a number of ways for people to make comments:
- In person at the Exhibition;
- by post;
- by email;
- by phone.

7.19 As noted the closing date for sending responses to SPEN will be midnight on **Sunday 24th March 2024. If contacting SPEN by post, please allow up to 7 days for these to be received. It may not be possible to consider comments received after this date.** Following this date, the information will remain accessible online on the project website and available to download.

Next Steps: Route Alignment and Environmental Appraisal

7.20 Following receipt of comments and any additional information relating to the Study Area, SPEN will review the consultation responses and either confirm, modify or amend the Preferred Route as required.

7.21 The outcome of this review process will be the confirmation of a Proposed Route to the proposed Daer Wind Farm. The Proposed Route will then be carried forward to detailed environmental impact assessment and discussion with relevant landowners.

7.22 The Proposed Route will also progress to a more detailed engineering review of the overhead alignment including individual pole positioning and identification of construction access routes which will be informed by the parallel environmental impact assessment stage and ground survey work.

7.23 SPEN will consult fully with affected landowners and occupiers on all aspects of the Daer 132kV Connection Project and will give them further opportunity to comment on proposals as they are developed in further detail.

7.24 The detailed route alignment, including all ancillary development will be included in the Application for Section 37 Consent and deemed Planning Permission.

Scoping

7.25 Following this consultation stage and confirmation of the Proposed Route, it is SPEN's intention to submit a Scoping Report to the Scottish Ministers with a written request under Regulation 7 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 for their opinion as to the information to be provided in the EIA Report that SPEN intends to prepare. The Scoping Report will set out the proposed structure and content of the Report and identify the possible effects on the environment of the Proposed Route alignment. The Scoping Report will reference this Routeing and Consultation Document.

EIA Report

7.26 Following receipt of the Scoping Opinion, as to the proposed information to be provided in the EIA Report, the Project Team will undertake the required specialist studies and detailed environmental impact assessment for the Proposed Route. In undertaking the detailed environmental and technical assessment, localised deviations from the Proposed Route maybe identified in order to mitigate local impacts.

7.27 SPEN will continue to progress the detailed alignment for the 132kV OHL, including individual pole positioning as informed by the EIA surveys, detailed engineering ground surveys and discussions with landowners.

7.28 The EIA Report will identify and describe in detail the environmental effects of the proposed overhead line construction and operation, and will identify all appropriate mitigation measures. The completed Report will accompany the application for Section 37 consent and deemed planning permission for the proposed Daer 132kV Connection and all ancillary development for the grid connection.

7.29 SPEN will consult fully with affected landowners and occupiers on all aspects of the Daer 132kV Connection project and will give them an opportunity to comments as they progress.

Comments during Consultation Stage

7.30 Please note that any comments made during this Routeing and Consultation Stage are **not** representations to The Scottish Government Energy Consents Unit, who will determine any subsequent application for consent. Following the submission of the Section 37 Application, interested parties will have the opportunity to make representations to the Scottish Government on the proposed development.

Appendix 1: Holford Rules & SHETL Clarification Note

The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with NGC 1992 and SHETL 2003 Notes)

Rule 1: Avoid altogether, if possible, the major areas of highest amenity, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

Note on Rule 1

a. Investigate the possibility of alternative routes, avoiding altogether, if possible major areas of highest amenity value. The consideration of alternative routes must be an integral feature of environmental statements. If there is an existing transmission line through a major area of highest amenity value and the surrounding land use has to some extent adjusted to its presence, particularly in the case of commercial forestry, then effect of remaining on this route must be considered in terms of the effect of a new route avoiding the area.

b. Areas of highest amenity value require to be established on a project-by-project basis considering Schedule 9 to The Electricity Act 1989, Scottish Planning Policies, National Planning Policy Guidelines[40], Circulars and Planning Advice Notes and the spatial extent of areas identified.

Examples of areas of highest amenity value which should be considered are:
Special Area of Conservation (NPPG 14) [41]
Special Protection Area (NPPG 14)
Ramsar Site (NPPG 14)
National Scenic Areas (NPPG 14)
National Parks (NPPG 14)
National Nature Reserves (NPPG 14)
Protected Coastal Zone Designations (NPPG 13)
Sites of Special Scientific Interest (SSSI) (NPPG 14)19
Schedule of Ancient Monuments (NPPG 5)
Listed Buildings (NPPG 18)
Conservation Areas (NPPG 18)
World Heritage Sites (a non-statutory designation) (NPPG 18)
Historic Gardens and Designed Landscapes (a non-statutory designation) (NPPG 18)

Rule 2: Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures which are used when lines change direction.

Note on Rule 2

a. Small areas of highest amenity value not included in Rule 1 as a result of their spatial extent should be identified along with other areas of regional or local high amenity value identified from development plans.
b. Impacts on the setting of historic buildings and other cultural heritage features should be minimised.
c. If there is an existing transmission line through an area of high amenity value and the surrounding landuses have to some extent adjusted to its presence, particularly in the case of commercial forestry, then the effect of remaining on this line must be considered in terms of the effect of a new route deviating around the area.

Rule 3: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers.

Note on Rule 3

[40] National Planning Policy Guidelines and Scottish Planning Policy (SPP) are now superseded.

[41] As referred to in SPP

a. Where possible choose inconspicuous locations for angle towers, terminal towers and sealing end compounds.

b. Too few angles on flat landscape can also lead to visual intrusion through very long straight lines of towers, particularly when seen clearly along the line.

Rule 4: Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

Rule 5: Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees.

Notes on Rule 4 & 5

a. Utilise background and foreground features to reduce the apparent height and domination of towers from main viewpoints.
b. Minimise the exposure of numbers of towers on prominent ridges and skylines.
c. Where possible follow open space and run alongside, not through woodland or commercial forestry, and consider opportunities for skirting edges of copses and woods. Where there is no reasonable alternative to cutting through woodland or commercial forestry, the Forestry Commission Guidelines should be followed (Forest Landscape Design Guidelines, second edition, The Forestry Commission 1994 and Forest Design Planning – A Guide to Good Practice, Simon Bell/The Forest Authority 1998).
d. Protect existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.

Rule 6: In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or 'wirescape'.

Notes on Rule 6

a. In all locations minimise confusing appearance.

b. Arrange wherever practicable that parallel or closely related routes are planned with tower types, spans and conductors forming a coherent appearance. Where routes need to diverge allow, where practicable, sufficient separation to limit the impacts on properties and features between lines.

Rule 7: Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.

Note on Rule 7

a. When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development.
b. Alignments should be chosen after consideration of impacts on the amenity of existing development and on proposals for new development.
c. When siting substations take account of the impacts of the terminal towers and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.

Explanatory Note on Rule 7

The assumption made in Rule 7 is that the highest voltage line is overhead.

Supplementary Notes

d. Residential Areas
Avoid routeing close to residential areas as far as possible on grounds of general amenity.
e. Designations of Regional and Local Importance
Where possible choose routes which cause the least disturbance to Areas of Great Landscape Value and other similar designations of Regional or Local Importance
f. Alternative Lattice Steel Tower Designs
In addition to adopting appropriate routeing, evaluate where appropriate the use of alternative lattice steel tower designs available where these would be advantageous visually, and where the extra cost can be

justified. [Note: SHETL have reviewed the visual and landscape arguments for the use of lattice steel towers in Scotland and summarised these in a document entitled Overhead Transmission Line Tower Study 2004].

FURTHER NOTES ON CLARIFICATION TO THE HOLFORD RULES

Line Routeing and People
The Holford Rules focused on landscape amenity issues for the most part. However, line routeing practice has given greater importance to people, residential areas etc.

The following notes are intended to reflect this
a. Avoid routeing close to residential areas as far as possible on grounds of general amenity.
b. In rural areas avoid as far as possible dominating isolated house, farms or other small-scale settlements.
c. Minimise the visual effect perceived by users of roads, and public rights of way, paying particular attention to the effects of recreational, tourist and other well used routes.

Supplementary Notes on the Siting of Substations
a. Respect areas of high amenity value (see Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area.
b. Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.
c. Use space effectively to limit the area required for development, minimizing the impacts on existing land use and rights of way.
d. Alternative designs of substation may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified.
e. Consider the relationship of tower and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints.
f. When siting substations take account of the impacts of line connections that will need to be made.

INTERPRETATION OF THE HOLFORD RULES 1 AND 2 AND THE NOTES TO RULE 2 REGARDING THE SETTING OF A SCHEDULED ANCIENT MONUMENT OR A LISTED BUILDING

1. Interpretation of The Holford Rules 1 and 2

1.1. Introduction
Rule 1 refers to avoiding major areas of highest amenity value, Rule 2 refers to avoiding smaller areas of high amenity value. These rules therefore require identification of areas of amenity value in terms of highest and high, implying a hierarchy, and the extent of their size(s) or area(s) in terms of major and smaller areas.

The NGC Notes to these Rules identify at Rule 1(b) areas of highest amenity value and at Rule 2(a) and (b) of high amenity value that existed in England circa 1992.

1.2. Designations
Since 1949 a framework of statutory measures has been developed to safeguard areas of high landscape value and nature conservation interest. In addition to national designations, European Community Directives on nature conservation, most notably through Special Areas of Conservation under the Habitats and Species Directive (92/43/EC) and Special Protection Areas under the Conservation of Wild Birds Directive (79/409/EEC) have been implemented. Governments have also designated a number of Ramsar sites under the Ramsar Convention on wetlands of International Importance (CM6464). Scottish Office circulars 13/1991 and 6/1995 are relevant sources of information and guidance. In addition, a wide range of non-statutory landscape and nature conservation designations affect Scotland.

1.3. Amenity
The term 'Amenity' is not defined in The Holford Rules but has generally been interpreted as designated areas of scenic, landscape, nature conservation, scientific, architectural or historical interest.

This interpretation is supported by paragraph 3 of the Schedule 9 to the Electricity Act 1989 (The Act). Paragraph 3 (1)(a) requires that in formulating any relevant proposals the licence holder must have regard to the desirability of preserving natural beauty, or conserving flora, fauna and geological or physiological features of special interest and of protecting sites, buildings, including structures and objects of architectural, historic or archaeological interest. Paragraph 3 (1)(b) requires the licence holder to do what he reasonably can do to

mitigate any effect which the proposals would have on the natural beauty of the countryside or on any flora, fauna, features, sites, buildings or objects.

1.4. Hierarchy of Amenity Value
Rules 1 and 2 imply a hierarchy of amenity value from highest to high.

Schedule 9 to the Act gives no indication of hierarchy of value and there is no suggestion of a hierarchy of value in either NPPG5: Archaeology and Planning, NPPG 13: Coastal Planning, NPPG 14: Natural Heritage or NPPG 18: Planning and the Historic Environment. Nevertheless, designations give an indication of the level of importance of the interest to be safeguarded.

1.5. Major and Smaller Areas
Rules 1 and 2 imply consideration of the spatial extent of the area of amenity in the application of Rules 1 and 2.

1.6. Conclusion
Given that both the spatial extent in terms of major and smaller and the amenity value in terms of highest and high that must be considered in applying Rules 1 and 2, that no value in these terms is provided by either Schedule 9 to the Act, relevant Scottish Planning Policies or National Planning policy Guidelines, then these must be established on a project-by-project basis. Designations can be useful in giving an indication of the level of importance and thus value of the interest safeguarded. The note to The Holford Rules can thus only give examples of the designations which may be considered to be of the highest amenity value.

2. The setting a Scheduled Ancient Monument or a Listed Building
The NGC note to Rule 2 refers to the setting of historic buildings and other cultural heritage features. NPPG 5: Archaeology and Planning refers to the setting of Scheduled Ancient Monuments and NPPG 18: Planning and the Historic Environment refers to the setting Listed Buildings. None of these documents define setting.

ENVIRONMENTAL AND PLANNING DESIGNATIONS – EXAMPLES OF DESIGNATIONS TO BE TAKEN INTO ACCOUNT IN THE ROUTEING OF NEW HIGH VOLTAGE TRANSMISSION LINES

Major Areas of Highest Amenity Value
1. In Scotland relevant national or international designations for major areas of highest amenity value include the following identified from Scottish Planning Policies and National Planning Policy Guidelines[42]:

Special Areas of Conservation- NPPG 14
Special Protection Areas- NPPG 14
Ramsar Sites - NPPG 14
National Scenic Areas- NPPG 14
National Parks- NPPG 14
National Nature Reserves - NPPG 14
Protected Coastal Zone Designations- NPPG 13
Sites of Special Scientific Interest- NPPG 14
Scheduled Ancient Monuments- NPPG 5
Listed Buildings- NPPG 18
Conservation Areas- NPPG 18
World Heritage Sites - NPPG 18
Historic Gardens and Designated Landscapes- NPPG 18

Other Smaller Areas of High Amenity Value
2. There are other designations identified in Development Plans of Local Planning Authorities which include areas of high amenity value:

Areas of Great Landscape Value
Regional Scenic Areas
Regional Parks
Country Parks
The nature of the landscape in these areas is such that some parts may also be sensitive to intrusion by high voltage overhead transmission lines but it is likely that less weight would be given to these areas than to National Scenic Areas and National Parks.

[42] Scottish Planning Policies and National Planning Policy Guidelines now superseded.

Flora and Fauna

3. Legislation sets out the procedure for designation of areas relating to flora, fauna and to geographical and physiogeographical features. Designations relevant to the routeing of transmission lines will include Special Area of Conservation, Special Protection Area, Sites of Special Scientific Interest, National Nature Reserves, Ramsar Sites and may also include local designations such as Local Nature Reserves.

Area of Historic, Archaeological or Architectural Value

4. Certain designations covering more limited areas are of relevance to the protection of views and the settings of towns, villages, buildings or historic, archaeological or architectural value. These designations include features which may be of exceptional interest. Of particular importance in this connection are:

Scheduled Monuments
Listed Buildings, especially Grade A and Grade B Conservation Areas
Gardens and Designated Landscapes included in the Inventory of Gardens and Designated Landscapes of Scotland

Green Belts

5. Generally the purposes of Green Belts are not directly concerned with the quality of the landscape.

Significance of Effects
<u>At this preliminary project stage</u> the relative significance of effects without mitigation of the different route options has been assessed using the following terms:

Major - a fundamental change to the environment
Moderate - a material but non-fundamental change to the environment;
Minor - a detectable but non-material change to the environment
None- no detectable change to the environment

A Route Sections

Route A SECTIONS	A 1- 0.8km	A2- 2.6km	A3-0.6km	A4-1.6km	A5-0.9km	A6-0.2km
Landscape						
landform	valley basin/ slope above 350m	steep valley slope	valley slope	slope	slope	valley slope
landcover	rough grassland/ coniferous plantation	coniferous plantation	coniferous plantation	coniferous plantation	coniferous plantation	coniferous plantation
landuse	rough grazing/ commercial forest/ recreation	commercial forest/ recreation crosses Southern Upland Way (SUW)/ 2 residential properties	commercial forest/ recreation/ 3 residential properties	commercial forest/ recreation	commercial forest/ recreation SUW / 1 residential property	commercial forest/ recreation/ 1 residential property
designation	Leadhills and Lowther SLA					
character (NatureScot)	Southern Uplands	Foothills with Forest	Foothills with Forest	Foothills with Forest	Foothills with Forest	Foothills with Forest
effect	**moderate**	**minor**	**minor**	**minor**	**minor**	**minor**
Visual						
visibility	partial	partial/ glimpse	partial/ glimpse	partial/ glimpse	partial/ glimpse	partial/ glimpse
receptor type	recreation, workers	recreation, residential, workers	recreation, residential, workers	recreation, workers	recreation, residential/ workers	recreation, residential/ workers
effect	**moderate-minor**	**moderate- minor**	**moderate- minor**	**moderate-minor**	**moderate- minor**	**moderate- minor**
Protected Areas & Features						
nature conservation (designations, habitats, fauna, comments)	May cross sensitive habitats such as wet heath in forestry rides or fire breaks	May cross sensitive habitats such as wet heath in forestry rides or fire breaks	May cross sensitive habitats such as wet heath in forestry rides or fire breaks	May cross sensitive habitats such as wet heath in forestry rides or fire breaks	May cross sensitive habitats such as wet heath in forestry rides or fire breaks	May cross sensitive habitats such as wet heath in forestry rides or fire breaks

	moderate Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**
effect	**moderate-minor**	**moderate-minor**	**moderate-minor**	**moderate-minor**	**moderate-minor**	**moderate-minor**
cultural heritage	No designated heritage assets within (1 km) Route Option Corridor. No non-designated heritage assets within (1 km) Route Option Corridor.	No designated heritage assets within (1 km) Route Option Corridor. Eight non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	No designated heritage assets within (1 km) Route Option Corridor. 11 non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	No designated heritage assets within (1 km) Route Option Corridor. No non-designated heritage assets within (1 km) Route Option Corridor.	No designated heritage assets within (1 km) Route Option Corridor. Three non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	No designated heritage assets within (1 km) Route Option Corridor. One non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of local heritage value.
effect	**none**	**moderate**	**moderate**	**none**	**minor**	**minor**
commercial forestry	The forestry within the Study Area is covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a wind farm or other development. There may be felling required to accommodate the OHL and as a result, some woodland loss.					
	Crosses “Natural Reserve” identified in LMP. West edge of			West end of route option crosses		

	Forest has been planted for black grouse habitat.			“minimum intervention area identified in LMP.		
effect	**moderate**	**minor**	**minor**	**moderate- minor**	**minor**	**minor**
geology/ hydrology						
geological features and potential effect significance	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**
	peat/priority peatland Areas of mapped peat soils and Class 1 priority peatland habitat. **moderate**	**peat/priority peatland** Area of mapped peat soils present. **moderate**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**	**peat/priority peatland** Area of mapped peat soils present. **moderate**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**
hydrological features and potential effect significance	**flooding** No mapped flood risk from rivers along route. Possible localised surface water flooding near channel, but route on higher ground. **none**	**flooding** Near area mapped as being at risk from flooding from rivers (depending on exact routing). **minor**	**flooding** Near area mapped as being at risk from flooding from rivers (depending on exact routing). **minor**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**
	water quality objectives Route passes over the Leadhills groundwater body, which has ‘poor’ WFD status and improvement objectives. Route crosses a watercourse that feeds into Daer Reservoir (public water supply). **moderate**	**water quality objectives** Route crosses Brattle Burn (tributary of the Cloffin Burn, which is currently classified as having ‘good’ WFD water quality status) **minor**	**water quality objectives** Route does not encounter mapped watercourses. **none**	**water quality objectives** Route crosses Brattle Burn (tributary of the Cloffin Burn, which is currently classified as having ‘good’ WFD water quality status) **minor**	**water quality objectives** Route does not encounter mapped watercourses. **none**	**water quality objectives** Route crosses Rivox Burn (tributary of the Garpol Water which is currently classified as having ‘good’ WFD water quality status) **minor**
	wetlands Areas of peat, wet grassland and non-specific wetland mapped on the Scottish Wetland Inventory. Part of a wider area of	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**

	wetland habitats. Unconfirmed potential for GWDTE. **moderate**					
effect	**moderate**	**moderate- minor**	**minor**	**moderate- minor**	**none**	**minor**
recreational features/ routes	Forest informal recreation	Forest informal recreation /SUW	Forest informal recreation	Forest informal recreation	Forest informal recreation /SUW	Forest informal recreation
effect	**minor**	**moderate- minor**	**minor**	**minor**	**moderate-minor**	**minor**
other features	Proposed Rivox Wind Energy Hub	National Gas Pipeline	Parallel access road to 3 No residential properties. Note: Connects to new underground cable along B7076 then parallels existing u/g cable along A701		National Gas Pipeline Crosses access road to 1 residential property/ forest	
effect	**moderate**	**moderate- minor**	**minor**	**none**	**moderate- minor**	**none**

B Route Sections

Route B SECTIONS	**B1-2.8km**	**B2- 2.9km**	**B3- 0.3km**
Landscape			
landform	slope /ridges above 350m	valley slope	slope
landcover	coniferous plantation	coniferous plantation/ rough grassland	coniferous plantation
landuse	commercial forest/ recreation	commercial forest/ recreation crosses parallels SUW)/ 3 residential properties/ rough grazing	commercial forest/ recreation
designation			
character (NatureScot)	Southern Uplands/ Foothills with Forest	Foothills with Forest/ Foothills	Foothills with Forest
effect	**minor**	**moderate - minor**	**minor**
Visual			
visibility	partial/ glimpse	partial	partial/ glimpse
receptor type	recreation, workers	recreation, residential, workers	recreation, workers
effect	**moderate- minor**	**moderate**	**moderate- minor**
Protected Areas & Features			
nature conservation (designations, habitats, fauna, comments)	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds	May cross sensitive habitats such as wet heath in forestry rides or fire breaks and blanket mire and acid flush in moorland areas **moderate** Watercourse crossings **minor**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds

	moderate Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	**moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**
effect	**moderate- minor**	**moderate- minor**	**moderate- minor**
cultural heritage	No designated heritage assets within (1 km) Route Option Corridor. Two non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	One designated heritage asset (Stanshielrig, homestead, enclosures, field systems & clearance cairns (SM 4057)) within (1 km) Route Option Corridor. 28 non-designated heritage assets within (1 km) Route Option Corridor. Five of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). The Route Option Corridor crosses an area of prehistoric settlement classed as of 'national' heritage value. The (1 km) Route Option Corridor intersects with the Beattock Archaeologically Sensitive Area (ASA), a DGC 'regional' designation. The OHL option stops short of the ASA boundary. Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.	No designated heritage assets within (1 km) Route Option Corridor. One non-designated heritage asset within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of local heritage value.
effect	**minor**	**moderate**	**minor**
commercial forestry	The forestry within the Study Area is covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a wind farm or other development. There may be felling required to accommodate the OHL and as a result, some woodland loss.		
	East end of route option crosses "minimum intervention" area identified in LMP.	Crosses "minimum intervention" area identified in LMP.	Crosses "minimum intervention" area identified in LMP.
effect	**moderate- minor**	**moderate- minor**	**moderate- minor**
geology/hydrology			

geological features and potential effect significance	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**
	peat/priority peatland Area of mapped peat soils present. **moderate**	**peat/priority peatland** Area of mapped peat present. **moderate**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**
hydrological features and potential effect significance	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** Mapped flood risk from rivers where route crosses Garpol Water. **minor**	**flooding** Mapped flood risk from rivers where route crosses Garpol Water. **minor**
	water quality objectives Route passes over the Leadhills groundwater body, which has 'poor' WFD status and improvement objectives. Route crosses a watercourse that feeds into Daer Reservoir (public water supply). Route may cross Coalpit Burn (tributary of the Rivox Burn then Garpol Water which is currently classified as having 'good' WFD water quality status) **moderate**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**
	wetlands Area of peat mapped on the Scottish Wetland Inventory. Part of a wider area of wetland habitats. Unconfirmed potential for GWDTE. **moderate**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**
effect	**moderate**	**moderate- minor**	**minor**
recreational features/ routes	Forest informal recreation	Forest informal recreation /SUW	Forest informal recreation
effect	**minor**	**moderate- minor**	**minor**
other features	Proposed Rivox Wind Energy Hub Crosses forest / proposed Daer Wind Farm access road x 2.	Parallels National Gas Pipeline Note: Parallels existing underground cable (Harestanes) along Crooked Road (SUW) & A701 to Moffat Substation	Proposed Rivox Wind Energy Hub Crosses forest / proposed Daer Wind Farm access road x 1
effect	**moderate**	**moderate- minor**	**moderate**

C Route Sections

Route C SECTIONS	C 1- 2.2km	C2- 2.0km	C3-2.4km	C4-1.5km	C5- 2.0km
Landscape					
landform	slope /ridges/valleys above 350m	slope	undulating slope	undulating slope	**slope/ridge**
landcover	coniferous plantation	coniferous plantation	coniferous plantation/	rough grassland	coniferous plantation
landuse	commercial forest/ recreation/	commercial forest/ recreation	commercial forest/ recreation	Improved grassland, rough grazing/ 4 residential properties, crosses Core Path	commercial forest/ recreation
designation	Leadhills and Lowther SLA				
character (NatureScot)	Southern Uplands/ Foothills with Forest	Foothills with Forest	Foothills with Forest / Foothills	Foothills	Foothills with Forest
effect	**moderate**	**minor**	**minor**	**moderate - minor**	**minor**
Visual					
visibility	partial/ glimpse	partial/glimpse	partial/ glimpse	partial	partial/ glimpse
receptor type	recreation, workers	recreation, workers	recreation, workers	recreation, residential/ workers	recreation, workers
effect	**moderate- minor**	**moderate- minor**	**moderate- minor**	**moderate**	**moderate- minor**
Protected Areas & Features					
nature conservation (designations, habitats, fauna, comments)	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks and blanket mire and acid flush in moorland areas **moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Pass close to Lochwood SSSI **negligible** May cross sensitive habitats such as blanket mire and acid flush **moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**
effect	**moderate- minor**	**moderate- minor**	**moderate- minor**	**moderate- minor**	**moderate- minor**

cultural heritage	No designated heritage assets within (1 km) Route Option Corridor. No non-designated heritage assets within (1 km) Route Option Corridor.	No designated heritage assets within (1 km) Route Option Corridor. One non-designated heritage asset within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	One designated heritage asset (Fauld Burn, enclosure and building 875m W of Stidriggs (SM 12613) within (1 km) Route Option Corridor. 25 non-designated heritage assets within (1 km) Route Option Corridor. Four of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). The Route Option Corridor crosses an area of prehistoric settlement classed as of 'national' heritage value. The (1 km) Route Option Corridor intersects with the Beattock Archaeologically Sensitive Area (ASA), a DGC 'regional' designation. Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.	Two designated heritage assets (Fauld Burn, enclosure and building 875m W of Stidriggs (SM 12613) and Stidriggs, cairn 750m SSW of (SM 12658)) within (1 km) Route Option Corridor. 34 non-designated heritage assets within (1 km) Route Option Corridor. Three of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). The Route Option Corridor crosses an area of prehistoric settlement classed as of 'national' heritage value. The (1 km) Route Option Corridor intersects with the Beattock Archaeologically Sensitive Area (ASA), a DGC 'regional' designation. Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.	No designated heritage assets within (1 km) Route Option Corridor. One non-designated heritage asset within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.
effect	**None**	**minor**	**moderate**	**moderate**	**minor**

commercial forestry	The forestry within the Study Area is covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a wind farm or other development. There may be felling required to accommodate the OHL and as a result, some woodland loss.				
		Crosses "minimum intervention" area identified in LMP.	Crosses "minimum intervention" area identified in LMP.		Crosses "minimum intervention" area identified in LMP.
effect	**minor**	**moderate- minor**	**moderate- minor**	**none**	**moderate- minor**
geology /hydrology					
geological features and potential effect significance	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**
	peat/priority peatland Area of mapped peat and peat soils present. **moderate**	**peat/priority peatland** Area of mapped peat present. **moderate**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**	**peat/priority peatland** Area of mapped peat present. **moderate**	**peat/priority peatland** Area of mapped peat present. **moderate**
hydrological features and potential effect significance	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** Mapped flood risk from rivers where route crosses Lochan Burn. **minor**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**
	water quality objectives Route passes over the Leadhills groundwater body, which has 'poor' WFD status and improvement objectives. Route crosses a watercourse that feeds into Daer Reservoir (public water supply). **moderate**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**	**water quality objectives** Route crosses Kinnel Water, which is currently classified as having 'good' WFD water quality status. Route also crosses Lochan Burn, a tributary of Kinnel Water. **minor**	**water quality objectives** Route does not encounter mapped watercourses. **none**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**
	wetlands Areas of peat and wet grassland mapped on the Scottish Wetland Inventory. Part of a wider area of wetland habitats. Unconfirmed potential for GWDTE. **moderate**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**
effect	**moderate**	**moderate-minor**	**minor**	**moderate**	**moderate-minor**

recreational features/ routes	Forest informal recreation	Forest informal recreation	Forest informal recreation/. Forest car park. Crosses Roman & Reivers Route	Crosses Core Path	Forest informal recreation
effect	**minor**	**minor**	**moderate- minor**	**minor**	**minor**
other features	Proposed Rivox Wind Energy Hub	Crosses forest / proposed Daer Wind Farm access road x 1		Note Parallels existing underground cable (Minnygap) to Moffat Substation	Proposed Rivox Wind Energy Hub Crosses forest / proposed Daer Wind Farm access road x 1
effect	**moderate**	**minor**	**none**	**none**	**moderate**

D Route Sections

Route D SECTIONS	**D 1- 2.6km**	**D2- 2.6km**	**D3-3.1km**	**D4- 2.5km**	**D5- 1.3km**
Landscape					
landform	slope / valleys above 350m	valley slope	undulating slope	valley slope	undulating slope
landcover	rough grassland/coniferous plantation	rough grassland/ improved grassland/ coniferous plantation	coniferous plantation	rough grassland/ improved grassland/ coniferous plantation	coniferous plantation /rough grassland/ improved grassland
landuse	commercial forest/ recreation	upland grazing/ commercial forest/ recreation / 3 residential properties	commercial forest/ recreation	upland grazing/ commercial forest/ recreation/ 3 residential properties	commercial forest/ recreation upland grazing
designation	Leadhills and Lowther SLA				
character (NatureScot)	Southern Uplands /Foothills with Forest	Foothills with Forest	Foothills with Forest/ Foothills	Foothills with Forest	Foothills with Forest / Foothills
effect	**moderate**	**moderate - minor**	**minor**	**moderate - minor**	**moderate- minor**
Visual					
visibility	partial	partial	partial/ glimpse	partial	partial/ glimpse
receptor type	recreation, workers	recreation, workers, residential	recreation, workers	recreation, workers, residential	recreation, workers
effect	**moderate-minor**	**moderate**	**moderate- minor**	**moderate**	**moderate- minor**
Protected Areas & Features					
nature conservation (designations, habitats, fauna, comments)	May cross sensitive habitats such as wet heath in forestry rides or fire breaks and blanket mire and acid flush in moorland areas **moderate** Watercourse crossings **minor**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks and blanket mire and acid flush in moorland areas **moderate** Watercourse crossings **minor**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds **moderate**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks and blanket mire and acid flush in moorland areas **moderate** Watercourse crossings **minor**	May cross sensitive habitats such as wet heath in forestry rides or fire breaks **moderate** Watercourse crossings **minor** Nesting birds **moderate**

	Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Nesting birds **moderate** Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**	Protected species including otter, water vole, badger, red squirrel, pine marten reptiles **moderate** Possible impacts on bat roosts if trees need to be removed **moderate**
effect	**moderate- minor**	**moderate- minor**	**moderate- minor**	**moderate- minor**	**moderate- minor**
cultural heritage	No designated heritage assets within (1 km) Route Option Corridor. Three non-designated heritage assets within (1 km) Route Option Corridor. Potential for direct impacts on non-designated archaeological remains of regional or local heritage value.	Three designated heritage assets (Kinnelhead Tower, fortified farmstead & cross incised stones (SM 8610) Kinnelhead Cottage, building 285m SSW of (SM 12615) and Kinnelhead Cottage, cairn 540m S of (SM 12655)) within (1 km) Route Option Corridor. 31 non-designated heritage assets within (1 km) Route Option Corridor. Two of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-	Two designated heritage assets Kinnelhead Cottage, cairn 540m S of (SM 12655) and Stiddrig Cairn, long cairn and cairn (SM 640)) within (1 km) Route Option Corridor. 22 non-designated heritage assets within (1 km) Route Option Corridor. Two of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.	One designated heritage asset (Kinnelhead Tower, fortified farmstead & cross incised stones (SM 8610)) within (1 km) Route Option Corridor. 24 non-designated heritage assets within (1 km) Route Option Corridor. Three of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value. Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.	Two designated heritage assets (Fauld Burn, enclosure and building 875m W of Stidriggs (SM 12613) and Kinnelhead Cottage, cairn 540m S of (SM 12655)) within (1 km) Route Option Corridor. 30 non-designated heritage assets within (1 km) Route Option Corridor. Four of these are considered by DGC HER to be of 'national' heritage value (schedulable quality). The (1 km) Route Option Corridor intersects with the Beattock Archaeologically Sensitive Area (ASA), a DGC 'regional' designation. The OHL option stops short of the ASA boundary. Potential for direct impacts on non-designated archaeological remains of national, regional or local heritage value.

		designated) assets of 'national' heritage value.			Potential for adverse effects on setting of scheduled monument of 'national' heritage value. Potential for adverse effects on settings of (non-designated) assets of 'national' heritage value.
effect	**minor**	**moderate**	**moderate**	**moderate**	**moderate**
commercial forestry	The forestry within the Study Area is covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a wind farm or other development. There may be felling required to accommodate the OHL and as a result, some woodland loss.				
	Crosses "minimum intervention" area identified in LMP. West edge of Forest has been planted for black grouse habitat.		Crosses "minimum intervention" area identified in LMP.	Crosses "minimum intervention" area identified in LMP.	Crosses "minimum intervention" area identified in LMP.
effect	**moderate- minor**	**minor**	**moderate- minor**	**moderate- minor**	**moderate- minor**
geology/hydrology					
geological features and potential effect significance	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**	**designated geological sites** No designated sites identified. **none**
	peat/priority peatland Area of mapped peat and peat soils present. **moderate**	**peat/priority peatland** Area of mapped peat present. **moderate**	**peat/priority peatland** No mapped peat or Class 1 or 2 priority peatland. **none**	**peat/priority peatland** Area of mapped peat present. **moderate**	**peat/priority peatland** Area of mapped peat present. **moderate**
hydrological features and potential effect significance	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** Mapped flood risk from rivers where route crosses Lochan Burn. **minor**	**flooding** No mapped flood risk from rivers along route. **none**	**flooding** No mapped flood risk from rivers along route. **none**
	water quality objectives Route passes over the Leadhills groundwater body, which has 'poor' WFD status and improvement objectives. Route crosses a watercourse that feeds into Daer Reservoir (public water supply). **moderate**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**	**water quality objectives** Route crosses Kinnel Water, which is currently classified as having 'good' WFD water quality status. Route also crosses Lochan Burn, a tributary of Kinnel Water. **minor**	**water quality objectives** Route does not encounter mapped watercourses. **none**	**water quality objectives** Route crosses Garpol Water, which is currently classified as having 'good' WFD water quality status. **minor**

	wetlands Areas of peat and wet grassland mapped on the Scottish Wetland Inventory. Part of a wider area of wetland habitats. Unconfirmed potential for GWDTE. **moderate**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**	**wetlands** No wetlands mapped on the Scottish Wetland Inventory. **none**
effect	**moderate**	**moderate-minor**	**minor**	**moderate**	**moderate-minor**
recreational features/ routes	Forest informal recreation	Forest informal recreation/. crosses Roman & Reivers Route/ Core Path	Forest informal recreation	Forest informal recreation/ crosses Core Path	Forest informal recreation
effect	**minor**	**moderate- minor**	**minor**	**minor**	**minor**
other features	Proposed Rivox Wind Energy Hub Crosses forest access road.	Crosses forest / proposed Daer Wind Farm access road x 1	Parallels forest / proposed Daer Wind Farm access road. Note: Parallels existing underground cable (Minnygap) to Moffat Substation	Crosses forest / proposed Daer Wind Farm access road x 1	
effect	**moderate**	**minor**	**minor**	**minor**	**none**

Appendix 3: Preliminary List of Potential Effects

At this Routeing and Consultation Document stage of the Project, based on the environmental baseline information collected and completed evaluation of route options, the potential significant effects of the proposed development on the environment have been identified as follows:

Landscape and Visual

Potential landscape and visual effect of the proposed overhead line during construction and operation.

Ecology and Nature Conservation

Potential effects during construction and operation include:

- loss or disturbance of habitats of local or national significance;
- loss of disturbance of Ground Water Dependant Terrestrial Ecosystems (GWDTE);
- pollution of watercourses and tributaries that may be used by salmonid fish, lampreys, otter and potentially water vole;
- disturbance of badgers, red squirrel, pine marten and bats, which may use areas in and around the OHL route corridor;
- disturbance of breeding, foraging and passage birds in the area, and potential for collisions with OHL.

Archaeology and Cultural Heritage

Potential effects on archaeology and cultural heritage during construction and operation include:

- direct impacts on surviving visible features of national, regional, or local heritage value;
- direct impacts on buried archaeological remains and deposits;
- impacts on the settings of designated heritage assets;
- impacts on the settings of non-designated heritage assets of potential national heritage value.

Commercial Forestry

Potential effect on the existing commercial forestry plantation covered by the Beattock Land Management Plan (LMP) which runs from 2017 - 2027. The LMP will need to be amended to allow for the proposed OHL and compensatory planting undertaken. This amendment to the LMP will take account of any updates or revisions to accommodate for other consented development in the area.

Geology/Hydrology/ Hydrogeology

Potential effects to the geological or hydrological environment during construction and operation could result from the following:

- Changes in surface water or groundwater quality as a result of construction activities (e.g. release of sediment from stockpile storage, storage of weather sensitive materials at laydown areas, construction and use of access tracks, mechanical digging of new or existing drainage and cable channels, vehicle access over watercourses, construction of watercourse crossings and digging of excavations, leaks/spills of fuel/oils, foul waste from welfare units, pH changes due to use of cement).
- Changes in surface watercourse morphology and flow resulting from construction in watercourses or on banks.
- Changes in local surface water flows, drainage patterns, flood water storage and associated flood risk (at, or downstream of, the development) as a result of works in or near watercourses and flood plains.
- Changes in infiltration rates and groundwater recharge due to increased hardstanding.
- Changes in groundwater flow direction (e.g. due to installation of subsurface features).
- Changes in groundwater flows and levels due to excavation dewatering (if required).
- Physical removal, or disturbance, of peat or GWDTE due to excavations or construction.

- Disturbance of, or changes to, the hydrological regime supporting peat/bog habitats and GWDTE.

It should also be noted that the proposed development itself has the potential to be affected by flooding.

Further work or consultation (desk based or field studies) following the selection of the Proposed Route (i.e. as part of the Scoping Stage and/or Environmental Impact Assessment process) may identify other sensitive receptors that could be affected by the proposed development.

Appendix 4: Preliminary List of Desk and Field Studies

The Table below provides a preliminary list of proposed desk and field studies to be carried out to support matters to be addressed throughout the environmental process. A number of these tasks have been undertaken for the identification of the Route Options Appraisal and preparation of this Routeing and Consultation Document.

Topic	Method
Planning	Desk review of planning policy context: national, strategic and local planning policy (Local Development Plans) and supplementary guidance.
Landscape and Visual	Good practice as described in Landscape and Visual Impact Assessment (LVIA) guidance produced by the Landscape Institute/IEMA (2013) shall be followed in undertaking the appraisal of potential effects on landscape and visual amenity arising from the proposed development. Desk and field studies shall comprise of the following tasks: ▪ Desk survey review of baseline information covering key features of the physical environment including: geology, soils, drainage, landform, landcover and landuse. ▪ Desktop review of relevant planning policy and landscape character assessments. ▪ Fieldwork to determine key landscape features, identify receptors, characterise surrounding landscape (condition and value) and define visibility. ▪ Fieldwork to identify of the approximate extent of visibility and key views. This will be informed by computer generated ZTV information. ▪ Assessment of potential effects on landscape features, landscape character and visual amenity. ▪ Computer generated photomontages will be prepared from agreed viewpoints to illustrate the landscape and visual effect.
Cultural Heritage	▪ Obtain up to date baseline cultural heritage data in GIS format on a defined Preferred Route alignment search area from Historic Environment Scotland and Local Authority Archaeological Services (WoSAS on behalf of SLC) and DGC Archaeological Service. ▪ Desk-based assessment enhancement of baseline conditions (historic maps, aerial photos, lidar imagery, documentary sources, etc) along Preferred Route alignment corridor. ▪ Reconnaissance field survey of corridor along Proposed Route and visual assessment (views to/from/across) external receptors (setting).
Nature Conservation & Ecology	▪ Desk study to review available baseline ecological and nature conservation information for the local area, including review of local development plans, existing ecological survey information, Local Biodiversity Action Plan, local bird club reports, bird atlases etc. Data to be sought from local Biological Records Centre, NatureScot, Scottish Wildlife Trust, Scottish Ornithology Club, local wildlife groups, Scottish Raptor Group. ▪ Site survey to undertake an Extended Phase 1 Habitat Survey of Preferred OHL corridor and targeted National Vegetation Classification (NVC) survey of GWTDE's. ▪ The combination of desk study, consultations and site survey will allow: - an initial assessment of the value of habitats and species along the preferred route corridor; - identify the need and timing for any species-specific surveys; - identify potential mitigation and compensation measures.

	Further specialist studies may be required, and the scope and detail of such work shall be reviewed and agreed with NatureScot at the outset to ensure their requirements are met balanced with the project budget and programme. At this stage the following studies are proposed: ▪ Breeding bird surveys (including black grouse, raptors and wader surveys); ▪ Vantage point flight activity surveys; ▪ Bat habitat assessment (including roost assessment where necessary); ▪ Badger survey of the route corridor; ▪ Otter and water vole survey of watercourse crossings. ▪ Pine martin and red squirrel survey of suitable habitats. ▪ Fish habitat assessment of river crossings.
Geology & Hydrology	▪ Desk study review of the geological and hydrogeological environment, including Ordnance Survey maps, geological and soils mapping, climate and catchment information, flood mapping, and other relevant publicly available information. ▪ Site walkover to gather information in areas most likely to be affected by potential geological and hydrological changes and gain an overall understanding of the hydrological regime. ▪ Data request to Scottish Water with regard to the location of its assets. ▪ Data requests from Scottish Environment Protection Agency (SEPA), South Lanarkshire and Dumfries and Galloway Councils to inform the baseline water environment with respect to the presence of licensed or private water abstractions. ▪ Identification of the sources of water supplies that could feasibly be affected by the proposed development (depending on the results of the data request). ▪ Detailed ground survey by SPEN at detailed design stage. ▪ Identification of potential GWDTEs (in conjunction with the findings of the ecological surveys). ▪ Peat depth probing survey in areas of potential deep peat (depending on proposed route, extent of new access tracks, and findings of ecological survey work). ▪ A Flood Risk Assessment (if required).
Commercial Forestry	▪ Obtain baseline woodland data from landowners in GIS format. ▪ Desk-based assessment (maps, aerial photos). ▪ Field survey encompassing corridor along Proposed Route.
Recreation and Tourism	▪ Desktop review of OS map/ baseline local tourist/recreation information and Core Paths Plan. ▪ Site visit to determine key recreational resources (links with landscape and visual site visit/ identification of viewpoints).
Infrastructure and Utilities	▪ Desk study review of OS maps/ information collected from Utility companies.
Landuse and Property	▪ Desk study review of OS Maps and Local Development Plan (links with landscape and visual site visit/ identification of viewpoints). ▪ Consultation by SPEN with landowners as required.
Access and Transport	▪ Desk study review of OS Maps and discussion with SPEN regarding construction access traffic/ route strategy. ▪ Feedback from Council consultations.
Noise and Vibration	▪ SPEN specialist input as required to complete survey and assessment. ▪ Confirmation construction / operation noise in accordance with Guidance.
EMF	▪ SPEN specialist input to report on any changes to electro magnetic fields.

Appendix 5: Draft Mitigation Measures

This Appendix identifies a preliminary draft of actions that SPEN shall implement to reduce, offset, prevent or compensate for identified potential adverse effects on the environment that may otherwise result as a consequence of proposed development.

The specific mitigation measures associated with the following assessments: Landscape and Visual; Ecology and Ornithology; Heritage; Hydrology; and Forestry, will be identified, developed and detailed in the EIA Report.

Draft Schedule of Mitigation Measures

No.	Draft Schedule of Mitigation Measures	
General		
1	Construction Environmental Management Plan & Pollution Prevention Plan	All mitigation measures as outlined in the EIA Report and any planning consent conditions will be detailed and implemented by a Construction Environmental Management Plan (CEMP) and Pollution Prevention Plan (PPP) prepared specifically for the proposed 132kV overhead line connection between the proposed Daer Wind Farm and existing Substation at Moffat. These documents shall control and guide the working practices of the Contractor for the duration of the construction works and shall reflect current best practice and guidance in protecting the environment.
2	SWMP	A Site Waste Management Plan (SWMP) shall detail the requirements for management of any waste in accordance with statutory and licensing requirements, accepted good practice and to ensure that wherever possible materials are reduced, reused or recycled in preference to disposal. This will include toilet facilities, soils/ stone/ peat from excavations, concrete from washout areas, municipal type wastes etc.
Agricultural Land		
3	CEMP	On Site Construction Works. Reinstatement agreed with landowner and works undertaken in accordance with CEMP.
Air Quality		
4	CEMP/GPP	Control measures shall be put in place in accordance with the CEMP and Guidance for pollution prevention (GPP).
Noise and Vibration		
5	CEMP/GPP	Control measures shall be put in place in accordance with the CEMP and GPP.
Socio Economic & Community Effects		
6	CEMP	Control measures shall be put in place in accordance with the CEMP and GPP.
Traffic and Transport		
7	Traffic Management Plan	Prior to construction work starting any planning consent conditions shall be undertaken for example a Dilapidation Survey. A Traffic Management Plan shall also be prepared and indicate the agreed transport route, management measures and programme for restoration etc.
Utilities and Infrastructure		
8	CEMP	Control measures shall be put in place in accordance with the CEMP and GPP.
Waste and Resource Use		
9	CEMP/GPP	Control measures shall be put in place in accordance with the CEMP, SWMP and GPP.

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Ecology

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Chapter 7: Ecology (https://rivoxwindenergyhub.com/downloads/64b69eeca98af_vich_Volume_2_-_Chapter_7_-_Ecology.pdf)
Chapter 8: Ornithology (https://rivoxwindenergyhub.com/downloads/64b69eecaaa83_vich_Volume_2_-_Chapter_8_-_Ornithology.pdf)
Appendix 7.2: Habitats and Vegetation (including National Vegetation Classification) Survey Report (https://rivoxwindenergyhub.com/downloads/64b6c815b0bae_vich_Volume_4_-_Appendix_7.2_-_Habitat_and_Vegetation_Survey_Report.pdf)
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Managing Change in the Historic Environment- Setting (HES, 2020)
Guidance for Pollution Prevention

PAN 1/2013: Environmental Impact Assessment 2013
PAN 2: Planning and Archaeology 2011
PAN 60: Planning for Natural Heritage 2000

BS 4428 Code of Practice for General Landscape Operations (excluding Hard Surfaces)
BS 8601 Specification for Subsoil and Requirements for Use

Relevant Legislation
Electricity Act 1989 (as amended by the Utilities Act 2000)
Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
New Roads and Streetworks Act 1991
Water Environment (Controlled Activities) (Scotland) Regulations 2011& 2013 Amendment
Water Environment (Miscellaneous)(Scotland) Regulations 2017

Term	Explanation
Energy Consents Unit	*Certain applications for energy infrastructure are made to Scottish Ministers for determination. Such applications include the installation of certain overhead electric lines and associated infrastructure. Such applications are administered by this Unit.*
Environmental Impact Assessment (EIA)	*The process used for describing, analysing and evaluating the range of environmental effects that are caused by a proposed development.*
EIA Report	*The document supporting a planning application that sets out the findings of the EIA and produced in accordance with EIA Regulations.*
Mitigation	*Measures, including any process, activity or design to avoid, reduce or remedy adverse effects of a proposed development*

Transmission Equipment

The following are general definitions of terms used in relation to transmission equipment.

Term	Explanation
Cable	*Generally, refers to an underground "cable" suitably insulated, used for transmitting electricity.*
Conductor	*Wire strung between pylons, used for transmitting electricity.*
Earthwire	*Wire strung between the tops of pylons, used for lightning and system protection. May also be used to carry telecommunication signals*
Electricity lines	*Either an overhead line or an underground cable used to transmit electricity.*
Insulator	*Used to attach the conductors to the pylons preventing electrical discharge to the steelwork. Usually made from porcelain glass units, joined together to form an insulator ring.*
kV	*Kilovolt (one thousand volts)*
MW	*Megawatt (one million watts or one thousand kilowatts)*
Outage	*The withdrawal from service of any part of the transmission system for a period of time in connection with repair, maintenance, or construction of the transmission system as a result of breakdown or failure.*
Overhead Line	*An electric line installed above ground usually supported by lattice steel towers or wooden poles.*
SPEN	*Scottish Power Energy Networks. Develop and operate the transmission system on behalf of Scottish Power Transmission Ltd.*
SPT	*Scottish Power Transmission Ltd. Licence holder under the Electricity Act 1989, responsible for the transmission network from the English/ Scottish border to just north of Stirling.*
Sealing End Compound	*The compound area surrounding the terminal tower, where an overhead line converts to an underground cable.*
Substations	*Transforming or switching stations to control the voltage and direction of electricity. Transforming stations are used to increase the supply of electricity (to 275kV or 400kV) into the national grid system for transmission, and to reduce the voltage to lower levels (to 132kV) for distribution. Switching controls the direction of electricity and ensures fault protection.*
Switchgear	*Combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.*
Transformer	*A static electrical device that transfers energy by inductive coupling between its winding circuits. They are used to vary the relative voltage of circuits and in some cases isolate them.*
Wayleave	*An agreement granted by the owner or occupier of land whereby transmission equipment is permitted to be installed on, over or under the land so owned or occupied in return for annual payments.*

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