Faw Side Wind Farm Grid Connection Routeing Consultation Document

September 2020

SP ENERGY NETWORKS

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R1. Introduction

R1.1 Purpose of the Report

R1.1.1 This document has been prepared by The Environmental Dimension Partnership Ltd (EDP) and Stantec on behalf of SP EnergyNetworks (SPEN) and relates to the identification and appraisal of route options for two new 132 kilovolts (kV) overhead lines (OHL) supported on wooden poles to connect the proposed Faw Side Community Wind Farm to the transmission grid in the south of Scotland, hereafter referred to as the 'Proposed Development'.

R1.1.2 This report explains the background to the proposal, provides a description of the proposed grid connection and sets out the methodology for routeing the new OHL. It presents the findings of the environmental baseline and an evaluation of the route options, culminating in a description of the 'preferred route' for the connection. The report also sets out the process for consultation with stakeholders and other interested parties and how this will be undertaken, providing the opportunity for interested parties to comment on the preferred route and inform the next stages of the design and assessment process.

R1.2 Need for the Project

R1.2.1 There is a need to connect the proposed wind farm to the transmission grid in southern Scotland. This is to be done via two separate OHLs. When a wind farm developer applies for a connection via National Grid, within the Scottish Power Transmission (SPT) license area, SPT, as the transmission licence holder, is obliged to provide such a connection. As with all grid connections of this type, the initial premise is that these will be provided through OHLs. In broad terms, the lines will run from the substation at Faw Side Community Wind Farm making a direct connection to the steel lattice towers on the existing transmission line known as the 'V-Route', which runs from Melrose to the border with England.

R1.2.2 The location of the key elements of the electrical infrastructure and the wind farm are illustrated on **Figure 1**.

R1.3 The Need for Environmental Impact Assessment

R1.3.1 The Proposed Development, to install two above-ground electric lines of 132kV, is of a nature and scale that brings it within the scope of Schedule 2 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The Proposed Development is therefore potentially an 'EIA development', within the meaning given to it by the Regulations and for which an Environmental Statement must be prepared:

"The carrying out of development (other than development which is Schedule 1 development) to provide any of the following (2) an electric line installed above ground (a) with a voltage of 132 kilovolts or more."

R1.3.2 However, given the relatively short length of the line, the fact it is a wood pole line rather than a larger scale steel tower line, and in light of the apparent lack of environmental constraints within the local area (based on an initial review of on-line constrains mapping from Scottish Natural Heritage (SNH) and History Scotland), SPEN have taken the decision to screen the proposal to determine whether or not the proposal is EIA development or not.

R1.3.3 The Proposed Development is the subject of a Screening Opinion to be submitted to the Scottish Ministers to determine whether the likely effects of the Proposed Development would have a significant effect on the environment and therefore require an EIA.

R1.3.4 This Routeing Consultation Document has been prepared to inform the consultation and process, which is also set out in the Regulations. In addition, the options considered in the routeing study will form part of the 'assessment of alternatives' required as part of an EIA Report under the EIA regulations, should EIA be required.

R1.4 SPT and The Electricity Act (1989)

R1.4.1 SP Transmission Ltd (SPT) is responsible for the transmission network from the English/Scottish border to just north of Stirling, an area of some 23,000 square kilometres. For SPT to comply with its licence obligations, it must seek to provide a connection to the electricity network for developers, following a formal request process via National Grid. SP Energy Networks (SPEN) is responsible for the delivery of the transmission network on behalf of SPT.

R1.4.2 Under the Electricity Act 1989, SPT (on behalf of ScottishPower) is the holder of a transmission licence. Under Section 37 of the Electricity Act 1989, SPT is required to seek consent from the Scottish Ministers for the construction of any non-exempted OHL operating at a voltage greater than 20kV. The proposed OHLs are to be constructed at 132kV to facilitate the capacity of the proposed Faw Side Community Wind Farm only.

R1.4.3 Applications will be made by SPT to the Scottish Ministers for Section 37 (S37) consents under the Act in respect of the overhead electricity transmission line and any ancillary development.

R1.4.4 As part of their obligation under the licence agreement, and as defined in Section 9 of the Act, SPT have a statutory obligation *"to develop and maintain an efficient, co-ordinated and economical system of electricity distribution"* and also *"to facilitate competition in the supply and generation of electricity*'.

R1.4.5 These dual obligations are required to be undertaken at all times with regard to the protection of the environment, including fisheries, flora, fauna and amenity, and as specified within Schedule 9 of the Act. Schedule 9 states that in formulating any relevant proposals, a licence holder shall, when undertaking generation, transmission, distribution or supply of electricity:

"(a) …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) …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."

R1.4.6 In adhering to Schedule 9, SPT provide a Position Statement, reviewed and updated periodically which details how they will carry out their duties in developing and maintaining their network.

R1.4.7 In taking account of both the Statutory Obligations of Section 9 and those specific responsibilities detailed in Schedule 9, SPT seek to balance the technical, environmental and economic factors when developing OHLs and substations as are proposed for the Faw Side connection.

R1.5 Approach to Routeing Overhead Lines

R1.5.1 SPT aim to undertake routeing of OHLs with regard for the natural environment and the amenity of people living and working within an area, and in line with guidance on routeing such as that contained within the Holford Rules (see **Appendix 1**). These Rules are tried and tested and are still applicable to routeing today.

R1.5.2 SPT undergo routeing for OHLs via a sequential process which takes account of the range of technical, environmental and economic constraints at a broad and detailed level and with regard to comprehensive consultation with relevant stakeholders and the public. In doing so, they are able to provide viable routes which address the foreseeable constraints of a given Study Area. The use of the 'Preferred Route' as a means for consultation at the pre-scoping stage ensures that comments are then evaluated and revisions made to the route in the identification of a 'Proposed Route' to be taken through the EIA process, or appropriate environmental appraisal, should the proposal avoid the requirement for EIA.

R1.6 The Development and Consenting Process

R1.6.1 In 2018, The Environmental Dimension Partnership Ltd (EDP) and their wider team of specialised sub-consultants were commissioned by SPEN to undertake an Environmental Impact Assessment (EIA) of the Faw Side grid connection project. SPT have a tried and tested method of developing grid infrastructure and integrating this into the wider existing network within the area under their control. SPEN's approach to developing OHLs consists of three primary phases, within each of which additional sub-phases apply.

Phase 1: Routeing and Consultation

R1.6.2 SPEN are committed to consulting with statutory and non-statutory bodies throughout the development process, not only as a statutory duty within the planning system, but as a measure to involve, and gain feedback from, as broad a range of consultees and stakeholders as possible. Consultation with statutory organisations is not required as part of these early routeing studies; however, involving these consultees at this initial stage is considered an essential part of being able to define, early in the project, those constraints which will be key to the wider routeing study.

R1.6.3 The first stage of the project involves the identification of 'Preferred Routes' for the connection – these being the routes upon which detailed consultation is undertaken – through the provision of this Routeing Consultation Document. This document provides a detailed analysis of the constraints and opportunities of a given Study Area in the definition of the Preferred Route.

R1.6.4 The Preferred Route will be the subject of the main formal consultation undertaken during the pre-application stages. Following this consultation, it is possible that some changes to the route(s) will be suggested as a result of the emergence of new information. Subject to acceptance in environmental and technical terms, the suggested changes are adopted, and if necessary, subjected to additional consultation. Subject to agreement by all parties, the Preferred Route, with suggested changes, can be identified as the 'Proposed Route'. It is this route, or routes, that are taken forward into the assessment and appraisal phase of the project – whether this will be as part of an EIA or non-EIA will be determined during the Screening process.

Phase 2: Environmental Impact Assessment/Environmental Appraisal

R1.6.5 The EIA Process is set out in full within the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. EIA is required for developments falling within Schedule 2 to the EIA Regulations that are likely to have significant effects on the environment by virtue of factors such as

nature, size or location. In determining whether the proposed OHL development is likely to have significant effects on the environment, regard should be had to the selection criteria detailed at Schedule 3 to the EIA Regulations.

R1.6.6 Under the Regulations, Section 37 development that is considered likely to have significant effects on the environment must be subject to EIA and an Environmental Statement (ES) must be submitted with the Section 37 application.

R1.6.7 Where EIA is required, environmental information must be provided by the developer in an Environmental Report. Schedule 4 specifies the information that must or may be provided in such a Statement.

R1.6.8 The proposed overhead grid connection is Schedule 2 development: *"The carrying out of development (other than development which is Schedule 1 development) to provide (2) an electric line installed above ground (a) with a voltage of 132 kilovolts or more."*

R1.6.9 The OHL will be 5-7km in length depending on the Preferred Route and will include ancillary infrastructure in the form of substation development at the wind farm. SPEN have decided to 'screen' the Proposed Development to determine if EIA is required. A Request for a Screening Opinion was issued to the Scottish Government in July 2020.

R1.6.10 Should the Proposed Development be screened as an EIA development, SPEN would submit an EIA Report with the application for consent for the Proposed Development. In accordance with Regulation 6(2)(b) of the Regulations, this intention to submit an EIA Report confirms the Proposed Development as EIA development. If the Proposed Development is screened as not EIA, then SPEN would submit an Environmental Report identifying the potential effects and their magnitude.

Phase 3: Application for Consent

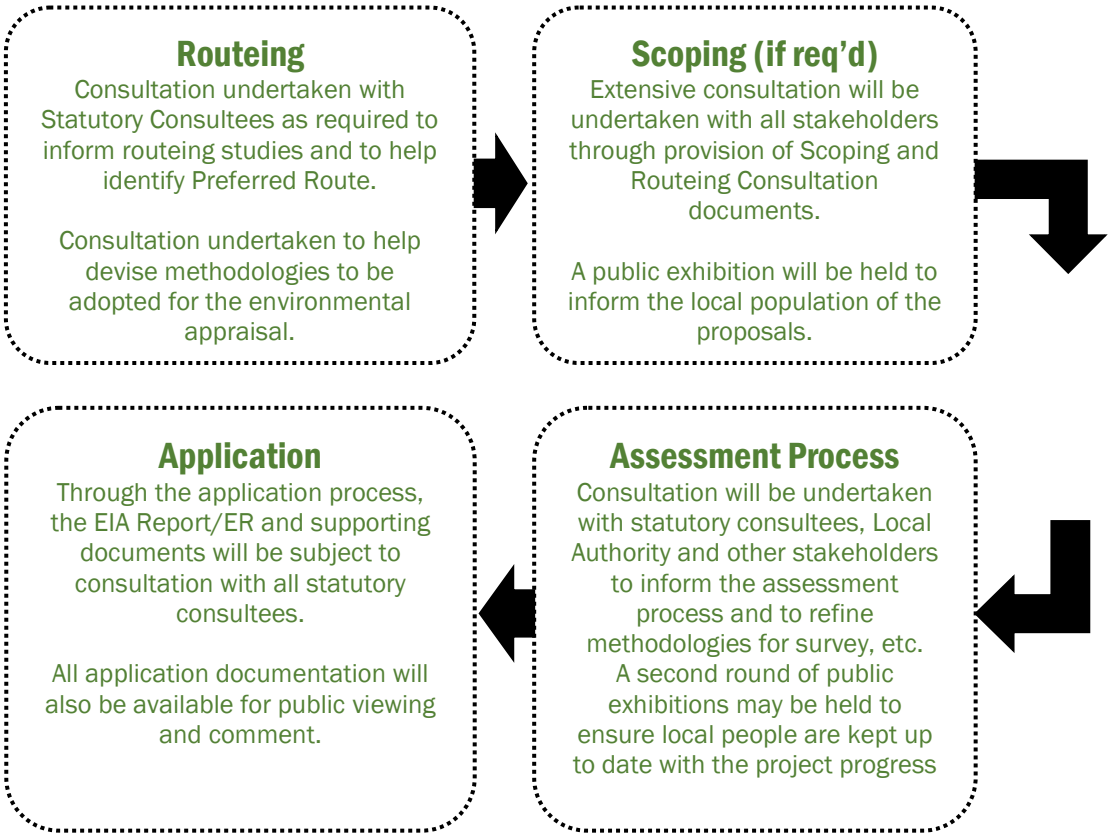
R1.6.11 As part of the environmental appraisal, EDP will be responsible for producing, in collaboration with the wider project team, the EIA Report (if EIA) or Environmental Report (ER) (if non-EIA). The EIA Report/ER will form the main application documentation, supported by any relevant Technical Appendices and other information. The application to install, and maintain in perpetuity, a 132kV grid connection and all ancillary infrastructure, will be made to the Scottish Ministers under Section 37 of the Electricity Act. In conjunction with this application, requests will be made for a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended), that planning permission be deemed to be granted in respect of the overhead electricity distribution line and any ancillary developments.

R1.7 Purpose of this Document and Consultation

R1.7.1 This Routeing Consultation Document has been prepared to set out the steps taken in identifying the Preferred Route(s) for the 132kV OHLs to service the Faw Side Community Wind Farm. It is provided for issue to interested stakeholders, giving them the information required to engage and comment on the project at an early stage. It sets out SPT's approach to routeing and the suggested form of the grid connection based on the work undertaken to date and offers an opportunity for comment.

R1.7.2 This consultation on the Preferred Route will be carried out using the information contained in this report and subsequently (if deemed as EIA through the screening process) through the issue of the Scoping Report to the Scottish Government Energy Consents and Deployment Unit (ECDU). Following consultation on the Preferred Route, any comments raised will be considered in order to

identify the 'Proposed Routes'. The following diagram illustrates the main stages in identifying a Proposed Route and carrying out the EIA, and highlights the stages at which consultation will occur:



R2. Elements of the Grid Connection

R2.1 Introduction

R2.1.1 SPEN has received a Grid Connection request via National Grid from the developers of the Faw Side Community Wind Farm. The proposed wind farm, for which an application was submitted in May 2019, comprises up to 45 turbines and has a potential installed capacity of up to 315MW, and is being developed by the electricity generator Community Windpower.

R2.1.2 The contract with the developer via National Grid requires the developer to provide a site for construction of the SPEN substation with 100m of the wind farm substation, including for a control building, a 132kV busbar and two circuit breakers and associated disconnectors. Given this position, the developer will determine the substation site.

R2.1.3 The reason for the proposed connection teeing onto two circuits is to balance the power flows on the Gretna–Hawick north and south circuits. To only tee onto one side of V-Route would create significant flow imbalance, heavily loading one side of this route. Additionally, the part of V-Route to be teed on to would not be able to carry the anticipated megawatts. The proposed option is considered to be the most technically and economically efficient compared to alternatives.

R2.1.4 It is proposed that the wind farm will be connected via these two OHLs to the existing high V-Route. V-Route runs broadly north-south along the A7 between Langholm and Hawick, as illustrated on **Figure 1**.

R2.1.5 In order to provide the required connection to the transmission network, the project requires the following key components, the requirement for each of which is detailed below:

- A 132kV SPT substation compound and control building at the Faw Side Community Wind Farm site.
- A 132kV SPT busbar, two 132kV circuit breakers and associated disconnectors at the Faw Side Community Wind Farm site.
- Two 132kV wood pole OHL circuits from Faw Side Community Wind Farm site to the Gretna–Hawick 132kV tower line (V-Route).
- On V-Route, installation of a junction tower and appropriate length of 132kV cabling from the proposed wood pole line to form a double 'T' connection.

R2.1.6 The substation at the Faw Side Community Wind Farm will 'step-up' the 33kV underground connections within the wind farm to 132kV for transmission by OHL. This substation will be provided by the wind farm developer and is included within the Section 36 application for the proposed Faw Side Community Wind Farm. It does not form part of the Proposed Development.

R2.2 Overhead Lines

R2.2.1 The UK Government and the Electricity Industry, including SPEN, constantly review their positions on the routeing of major electrical infrastructure projects. The evidence available, including economic, technical and environmental factors, specifically statutory duties and licence obligations, will support an OHL approach in most cases.

R2.2.2 It is therefore SPEN's view that wherever practical, an OHL approach is taken when planning and designing major electrical infrastructure projects. However, SPEN appreciates that there are specific circumstances in which an underground approach should be considered.

R2.2.3 If, in certain circumstances, it is determined that an underground cable is required instead of an OHL, the approach is to minimise the length of underground cable necessary to overcome the constraint to OHL routeing, consistent with a balance between technical and economic viability, deliverability and environmental considerations.

R2.2.4 In light of its licence obligations to provide the best technical and most cost-efficient solution for connection, SPT policy seeks to find an OHL solution for all transmission connections and only where there are exceptional constraints would underground cables be considered as a design alternative. Such constraints can be found in urban areas and in rural areas of the highest scenic and amenity value. Where an OHL solution is not achievable for technical reasons, the company will look to an underground cable solution as an alternative.

R2.2.5 The starting point for considering this connection is therefore the assumption that the grid connections will be provided by OHL along their entire length. Should the constraints determine that an underground cable is required, this will be evaluated as necessary.

Overhead Line Design

R2.2.6 The OHLs are proposed as 132kV connections to be supported by the 'Trident' wood pole design, and both connections will have a starting point of the substation within the Faw Side Community Wind Farm, and an endpoint at an appropriate connection point along V-Route, following consideration of the various environmental and technical constraints in the area. A single steel tower will be required near to the connection point with V-Route to allow the connection to tee into this line with appropriate safety distances.

R2.2.7 The 'Trident' wood pole 132kV OHL design utilises two standard pole types, as illustrated on **Figure 2**: a 'single' pole and an 'H' pole configuration. For single poles, the nominal height of the wood poles is likely to be c.15m, with a maximum above-ground height of 22m and a minimum above-ground height of 10m. The spacing between the poles will vary but will generally be 100m, with a maximum span length of 150m.

R2.2.8 For the 'H' pole configuration – which will generally be used at elevations of greater than 200m – the height will again be between 10m and 22m (above-ground), but the spans will be shorter at between 70m and 100m.

R2.2.9 The 'Trident' OHL design specification is a UK Electricity Industry Design Standard and the final designation of pole type is generally dependant on three main factors: altitude, weather and the topography of the route. The size of poles and span lengths will also vary depending on these factors, with poles being closer together at high altitudes to withstand the effects of greater exposure to high winds, ice and other weather events. The pole configuration, height and the distance between poles will therefore only be fully determined after a detailed line survey.

R2.2.10 The proposed wood pole will support three conductors (wires) as shown in **Figure 2**. The Trident wood pole design does not include a separate earth wire, as it is earthed at each end of the line and the telecommunications wire is included within one of the conductors.

R2.2.11 Following identification of the proposed route for the new line, a detailed topographical survey will be carried out. This is required to identify the proposed positions and heights of each individual tower and wood pole. Site surveys to examine the subsoil conditions will also be carried out at proposed tower and wood pole positions where required. These will inform the tower foundation designs.

R2.2.12 An Infrastructure Location Allowance (ILA) will be requested as part of the application for S.37 consent to allow an appropriate degree of flexibility during construction, should insurmountable constraints be found at site.

R2.2.13 A wayleave agreement is sought to secure access rights to the overhead line and to secure a level of resilience from trees and new buildings during its operational period. The wayleave corridor will be a minimum of 60m (20m (falling distance) between and 20m either side of each line) but if there are areas where the lines separate then this distance will increase to suit. For areas of forestry the falling distance of the trees would have to be taken into account. For this twin overhead line, a minimum wayleave width of 82.8m would be required through forestry; this assumes forestry up to 25m in height.

Overhead Line Construction

R2.2.14 Overhead line construction typically follows a standard sequence of events, which is:

- Prepare access to the pole/tower locations;
- Excavate pole/tower foundation area;
- Install pole/tower foundations;
- Erect wood poles/steel towers;
- String conductors; and
- Reinstate pole/tower sites and remove temporary accesses.

R2.2.15 For wood pole line construction, a crane is unlikely to be necessary, with the 'poles' generally being erected using normal agricultural machinery such as a digger with a lifting arm. Once the poles have been erected, the conductors are winched to/pulled from section poles, thus access to these structures is required for conductor drums and large winches.

R2.2.16 A tracked excavator and low ground-pressure vehicles, (e.g. tractor, Argocat, quad bikes) will be used to deliver, assemble and erect each wood pole structure at each location. The erection of the wood poles will require an excavation to allow the pole brace block and/or steel foundation braces to be positioned in place. A typical pole excavation will be $3m^2$ by 2m deep. The excavated material will be sorted into appropriate layers and used for backfilling. No concrete will be used. The excavator(s) then hoist the assembled structure into position and once the structure has been braced in position the trench is backfilled.

R2.2.17 On completion of the foundation installation, the tower will be delivered by an HGV lorry to each tower location from the site compound in individual bars or small pre-assembled sections. The tower will then be finally assembled on site in sections known as lifts; either a telescopic handler or a crane will be used to erect each lift.

R2.2.18 Tower erection operations are restricted to the tower working area and are considered to be a low impact in terms of environmental and ecological management. The main items of plant required for all tower erection activities will include but is not limited to:

- Crane/Telehandler; and
- HGV Lorries for site material deliveries.

R2.2.19 Prior to stringing the conductors, roads and railways that are to be crossed by the power line have to be protected by building a scaffold tunnel through which vehicles/trains can pass. Other obstacles such as existing power lines have to be either switched off, deviated or protected using 'live line' scaffolds.

R2.2.20 In all cases, every effort is made to cause least disturbance to landowners and local residents during construction. The route of the line is selected to avoid communities and individual dwellings as far as possible, and ground disturbance during construction of the new line will be reinstated.

Overhead Line Maintenance

R2.2.21 In general, a transmission line requires very little maintenance. It is periodically inspected to identify any unacceptable deterioration of components so that they can be replaced. From time to time, inclement weather, storms or lightning can cause damage to either the insulators or the conductors. If conductors are damaged, short sections may have to be replaced – that would involve winching to or from section poles. There is therefore a preference that any crushed stone access tracks built to access pole locations are left *in situ* for future use; this will be dependent on agreement with individual landowners and having regard to the views of other interested parties. Insulators and conductors are normally replaced after about 40 years and maintenance undertaken on wood poles and steel towers as required through their lifespan.

R3. Planning Policy Context

R3.1 Introduction

R3.1.1 The proposed grid connection is located primarily in The Borders Council area, with a small section in the vicinity of the Mosspaul Inn overlapping into Dumfries and Galloway. However, given the topography of this section, it is considered likely that the OHL preferred route will be wholly contained within the Border Council administrative area. In order to avoid confusion, the planning policy context set out below is focussed on the Borders Local Development Plan (LDP) and does not refer to the Dumfries and Galloway Plan.

R3.1.2 Notwithstanding the comments above, should the results of the routeing consultation suggest a Preferred Route partly contained within Dumfries and Galloway, the policy context will be amended accordingly in the Section 37 Application.

R3.2 Energy Policy

The Electricity Act

R3.2.1 Section 37 of the Electricity Act 1989 ('the Act'), provides that an application to install or keep installed an above-ground electricity line, shall be made to the Scottish Ministers who may direct that planning permission for the Proposed Development and any ancillary development shall be deemed to be granted under Section 57 (2) of the Town & Country Planning (Scotland) Act 1997 (as amended).

R3.2.2 The following hierarchy of policies and guidance will be considered:

- Government Energy Policy;
- National Planning Policies and Guidance;
- The Development Plan; and
- Topic related policies relevant to the Proposed Development.

UK and Scotland Energy Policy

R3.2.3 The UK is legally committed[1] to meeting 15% of its energy demand from renewable sources by 2020. The achievement of this target also helps achieve energy security and carbon reduction objectives.

R3.2.4 In June 2013, the Scottish Government published the Electricity Generation Policy Statement, following draft versions in 2010 and 2012. It is now government policy that Scotland's generation mix should:

- Deliver a secure source of electricity supply;
- Deliver energy at an affordable cost to consumers;
- Be largely decarbonised by 2030; and

[1] Via the 2009 Renewable Energy Directive 2009/28/EC

- Achieve the greatest possible economic benefit and competitive advantage for Scotland including opportunities for community ownership and community benefits.

R3.2.5 The objectives noted above are framed around a series of targets as set out below:

- Delivering the equivalent of at least 100% of gross electricity consumption from renewables by 2020 as part of a wider, balanced electricity mix, with thermal generation playing an important role though a minimum of 2.5GW of thermal generation progressively fitted with Carbon Capture and Storage (CCS);
- Enabling local and community ownership of at least 500MW of renewable energy by 2020;
- Lowering final energy consumption in Scotland by 12%;
- Demonstrating CCS at commercial scale in Scotland by 2020, with full retrofit across conventional power stations thereafter by 2025-30; and
- Seeking increased interconnection and transmission upgrades capable of supporting projected growth in renewable capacity.

R3.2.6 The Proposed Development is most directly compliant with the last of these five targets in that it provides a grid connection to a renewable energy project. In more general terms, however, it is evident that grid connections are a necessary part of energy infrastructure without which new generation projects are unable to contribute to the achievement of the targets set out in the first and second bullet points above.

R3.3 Development Plan Policy

R3.3.1 Sections 25 and 37 (2) of the Town and Country Planning (Scotland) Act 1997 (as amended by the Planning etc. (Scotland) Act 2006) require that planning decisions be made in accordance with the development plan, unless material considerations indicate otherwise.

R3.3.2 The current development plan is the Scottish Borders LDP (2016). The policy areas covered in this document will need to be assessed in determining the application. However, the assessment will also need to take account of other relevant material considerations.

Material Considerations

R3.3.3 In addition to the primacy of the development plan, decisions will also be made in the context of the following material policy considerations:

- The Climate Change Scotland Act (2009) (as amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019);
- The Scottish Renewables Action Plan (2009) and 2020 Route Map for Renewables in Scotland;
- The National Planning Framework 3 (NPF3) (2014);
- Scottish Planning Policy (SPP) (2014);
- The emerging Scottish Borders LDP2 (2020 or 2021);
- Scottish Borders Supplementary Planning Guidance:
  - Landscape capacity and cumulative Impact;
  - Local landscape designations;

- Renewable energy;
- Scottish Borders Woodland Strategy;
- Visibility mapping for windfarm development;

■ Planning Advice Notices (PANs);

- PAN 1/2011 – Planning and Noise;
- PAN 2/2011 – Planning and Archaeology;
- PAN 51 – Planning and Environmental Protection;
- PAN 60 – Planning for Natural Heritage;
- PAN 69 – Planning and Flood Risk;
- PAN 1/2013 Planning and Environmental Impact Assessment; and

■ Scottish Government web-based renewable advice.[2]

R3.3.4 The progress of Scottish Borders Council LDP2 will be monitored including cognisance of its material weight following publication of a Proposed Plan and eventual adoption throughout the development process.

R3.4 National Planning Policy Context

National Planning Framework for Scotland

R3.4.1 The National Planning Framework for Scotland 3 sets out the spatial strategy for Scotland's development. The framework highlights that having an efficient high voltage electricity transmission network is *"vital in meeting national targets for electricity generation, statutory climate change targets, and security of energy supplies".*

R3.4.2 The framework highlights the need to have electricity transmission links to connect the energy produced by new renewable developments to the Grid. It states that an enhanced high voltage network is *"needed to facilitate renewable electricity development and its export"* and that "*electricity grid enhancements will facilitate increased renewable electricity generation across Scotland".* The Framework goes on to state that "*strengthening the electricity grid will be essential in unlocking renewable resources, both onshore and offshore".*

Scottish Planning Policy

R3.4.3 Scottish Planning Policy (SPP) was published in June 2014 and is the Scottish Government's policy statement on national land use planning matters. Paragraph 154 states that the planning system should *"support the development of a diverse range of electricity generation from renewable energy technologies".*

R3.4.4 The Policy goes on to state in Paragraph 156 that:

"Strategic development plans should support national priorities for the construction or improvement of strategic energy infrastructure, including generation, storage, transmission and distribution

[2] http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables

networks. They should address cross-boundary issues, promoting an approach to electricity and heat that supports the transition to a low carbon economy".

R3.4.5 In addition, the Policy states that development plans should *"ensure an area's full potential for electricity and heat from renewable sources is achieved, in line with national climate change targets."*

The Climate Change Scotland Act (2009)

R3.4.6 This Act commits to reduce greenhouse gases and increase Scotland's potential for sustainable economic growth. The delivery of renewable energy generation and associated grid connection infrastructure is central to the policy.

R3.5 Key Planning Issues

R3.5.1 The table below details the policies at all levels from which the key considerations in determining a future planning application will be derived.

R3.5.2 Note that the Scottish borders LDP is currently being updated and it is likely that the LDP2 proposed plan will be published in 2020/2021 during the course of preparation of this project and application for consent. Relevant sections of the proposal plan will be incorporated when they become available, assuming they are available prior to submission.

Table 3.1: Key Planning Issues

Issue	Policy and Guidance	Criteria to meet
Landscape and Visual Impacts	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy EP5 Special Landscape Areas SPG: Landscape capacity and cumulative Impact SPG: Local Landscape Designations SPG: Renewable energy SPG: Visibility mapping for windfarm development	Consideration of landscape and visual impacts, including effects on wild land. Power lines within the site connecting the individual turbines to the on-site substation should always be underground. Careful consideration should be given to the relative merits of underground versus OHLs from the substation to the electricity distribution system. Where power lines cannot be undergrounded, careful consideration should be given to the visual impacts of any steel towers and the suitability of any route. Cable routes should be carefully chosen to avoid sensitive areas, which would be difficult to protect/renovate, and the land should be fully reinstated. Development proposals should respect, protect and/or enhance the region's landscape character, scenic qualities and features and sites designated for their landscape quality at any level. They should also reflect the scale and local distinctiveness of the landscape. Principles established in the European Landscape Convention and the local Landscape Assessment, and any subsequent revised or amended document, will be a material consideration in the assessment of proposals. 'Visual impacts' can be minimised by use of appropriate siting and design of ancillary buildings, power lines, access tracks etc. An assessment of the extent to which the

Issue	Policy and Guidance	Criteria to meet
		landscape is capable of accommodating the Proposed Development without significant detrimental impact on landscape character or visual amenity should be carried out. Proposals should take account of guidance contained in the Scottish Borders Supplementary Guidance.
Development Design/Principle Considerations	As above but also including Scottish Borders LDP Policy PMD1 Sustainability	Development should relate well to the scale, density, massing, character, appearance and use of materials of the surrounding area and in so doing be sympathetic to the local built forms as well as respecting the important physical, historic and landscape features of the site and its vicinity.
Forestry/Trees	The Scottish Government's Policy on Control of Woodland Removal (2009) Scottish Planning Policy (2014) Forestry and Land Management (Scotland) Act 2018; Scottish Government's policy on control of woodland removal: implementation guidance (February 2019); Scottish Government's web-based renewable advice Scottish Borders LDP Policy EP3 Local Biodiversity Scottish Borders LDP Policy EP13 Trees Woodlands and Hedgerows SPG: Scottish Borders Woodland Strategy	The inclusion of tree planting in landscaping and development schemes is encouraged. Appropriate compensatory planting should occur where trees are lost as part of approved development works In general, proposals should seek to protect and retain trees and woodlands and where this is not possible, appropriate replacement planting will be required. Areas identified within the Ancient and Semi Natural Woodland (ASNW) assessment for Scotland and the Native Woodland of Scotland (NWS) surveys should be given higher status relative to other woodlands when considering routing options
Natural Heritage/-Biodiversity	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy EP1 International Nature Conservation Sites and protected species Scottish Borders LDP Policy EP2 National Nature Conservation Sites and protected species Scottish Borders LDP Policy EP3 Local Biodiversity Scottish Borders LDP Policy EP13 Trees Woodlands and Hedgerows	Impacts on natural heritage, wildlife and habitat, ecosystems and biodiversity need to be assessed. Any impacts occurring should be avoided or adequately resolved. Development proposals should respect, protect and/or enhance the region's biodiversity, geodiversity and sites designated for their contribution to the natural environment at any level including ancient and semi-natural woodland. Development proposals likely to have a significant effect on an existing or potential Special Protection Area (SPA), existing or candidate Special Area of Conservation (SAC) or Ramsar Site, including developments outwith the site, will require an appropriate assessment and will only be permitted where: - the development does not adversely affect the integrity of the site; or - there are no alternative solutions and there are imperative reasons of overriding public interest including those of a socio-economic nature. Development proposals that would be likely to have an adverse effect on a European Protected Species will not be permitted unless it can be shown that:

Issue	Policy and Guidance	Criteria to meet
		- there is no satisfactory alternative, and - the development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, and - the development would not be detrimental to the maintenance of the population of the species at a favourable conservation status in its natural range. Developments affecting Sites of Special Scientific Interest (SSSI) will only be permitted where: - they will not adversely affect the integrity of the area or the qualities for which it has been designated, or - any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance. Green Networks should be protected and enhanced. Proposals for development in areas which form part of this network should seek to avoid fragmentation of a network and/or improve connectivity, where appropriate.
Impact on Historical/Cultural Environment	Scottish Planning Policy (2014) Historic Environment Policy for Scotland (HEPS 2019) Scottish Government's web-based renewable advice Scottish Borders LDP Policy PMD1 Sustainability Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy EP8 Archaeology	Potential impacts on the historic environment and cultural heritage, including scheduled monuments, listed buildings and their settings should be considered. Any impacts arising on the historic environment and cultural heritage should be avoided or adequately resolved. Development proposals should protect and/or enhance the character, appearance and setting of the region's historic environment principally by ensuring they are sympathetic to nearby buildings, sites and features, integrate well and complement the surrounding area. The information contained within the Council's Historic Environment Record and Scottish Historic Environment Policy, and any subsequent revised or amended document, will be a material consideration in the assessment of proposals. Development should not affect archaeological sites, monuments and other non-designated historic assets and areas of historical interest.
Public Access	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy PMD1 Sustainability Scottish Borders LDP Policy PMD4 Development Outwith Development Boundaries Scottish Borders LDP Policy ED7 Business Tourism and Leisure Development in the Countryside	Impacts on public access, including impacts on long distance walking and cycling routes and scenic routes should be taken into account. Development proposals should not impact adversely on any access routes and Core Paths. New or alternative access routes and enhancements to existing routes should be considered where these can be delivered as part of the development.
Impact on	Scottish Planning Policy (2014)	Effects on hydrology, the water environment and

Issue	Policy and Guidance	Criteria to meet
Geology, Hydrology and Hydrogeology	Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy EP15 Development Affecting the Water Environment Scottish Borders LDP Policy IS8 Flooding	flood risk need to be considered. Impacts on soil and ground stability will also need to be considered. Development proposals should maintain or enhance water quality, and take account of the need to manage water quantity, including flooding. In securing these objectives they should also seek to contribute positively to the general environmental quality of their area. If development is proposed adjacent to or in the vicinity of waterbodies, the water margins will be protected unless there are compelling reasons to justify why this should not be done. Development which could lead to an unacceptable on-site or off-site flood risk, as defined by the Risk Framework in SPP, will generally not be permitted. Where a proposed development could lead to an unacceptable flood risk, it may be that a Flood Risk Assessment (FRA) is able to clarify to the satisfaction of the Council and the Scottish Environment Protection Agency (SEPA) that the level of risk both on- and off-site would be acceptable. For any site, a Drainage Impact Assessment (DIA) may be required to ensure that surface water flows are properly taken into account in the development design.
Tourism and Recreation	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy PMD4 Development Outwith Development Boundaries Scottish Borders LDP Policy ED7 Business Tourism and Leisure Development in the Countryside Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy HD3 Protection of Residential Amenity	Impacts on tourism and recreation should be assessed. Any impacts arising should be avoided or adequately resolved. Development proposals should consider where they are likely to have significant impacts on areas and routes important for tourism or recreational use in the countryside.
Impact on Communities	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy PMD1 Sustainability Scottish Borders LDP Policy PMD4 Development Outwith Development Boundaries Scottish Borders LDP Policy ED7 Business Tourism and Leisure Development in the Countryside Scottish Borders LDP Policy ED9 Renewable Energy Development Scottish Borders LDP Policy HD3 Protection of Residential Amenity SPG: Landscape capacity and	Impacts on communities and individual dwellings, including visual impact/dominance, residential amenity and noise should be examined.

Issue	Policy and Guidance	Criteria to meet
	cumulative Impact SPG: Local Landscape Designations SPG: Visibility mapping for windfarm development	
Pollution	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy EP15 Development Affecting the Water Environment	Environmental pollution to water, air, or soil is a material consideration. The development should not have a significant adverse impact on air quality. Noise and nuisance may be material considerations, both in terms of proposed developments that are likely to cause noise or nuisance and in terms of proposed sensitive developments which may be affected.
Transport and access impacts	Scottish Planning Policy (2014) Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy IS4 Transport Development and Infrastructure Scottish Borders LDP Policy IS5 protection of Access Routes Scottish Borders Core Paths Plan South East Scotland Regional Transport Strategy	Impacts on road traffic and adjacent trunk roads needs to be considered including that from volume of traffic and abnormal loads. Any new direct access onto the regional road network should not, individually or incrementally, materially reduce the level of service of a route. There may be a requirement to prepare and implement construction travel plans to support the proposal. Furthermore, a Transport Assessment and appropriate mitigation measures may also be required.
Aviation	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development SPG: Renewable energy	Impacts on aviation and defence interests and seismological recording (Eskdalemuir Seismic Array is nearby) should be taken into account.
Impact on Broadcasting Installations	Scottish Planning Policy (2014) Scottish Borders LDP Policy ED9 Renewable Energy Development SPG: Renewable energy	Impacts on telecommunications and broadcasting installations need to be considered, particularly ensuring that transmission links are not compromised.
Decommissioning and Restoration	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development SPG: Renewable energy	Consideration is required of the potential decommissioning of a development including ancillary infrastructure, and site restoration. There should be appropriate provision in any assessment for decommissioning and restoration.
Cumulative Impacts	Scottish Planning Policy (2014) Scottish Government's web-based renewable advice Scottish Borders LDP Policy ED9 Renewable Energy Development SPG: Renewable energy	Consideration of wider cumulative impacts with other neighbouring renewable energy developments. In assessing cumulative landscape and visual impacts, the scale and pattern of the power lines, tracks, substations and ancillary development will be relevant considerations.

R4. Routeing Methodology

R4.1.1 The objective of routeing an overhead transmission line between specified points is to identify a technically feasible and economically viable route, which causes the least disturbance to people and the environment. The process of 'routeing' accounts for all elements of the grid connection, including the OHL and substation infrastructure that forms the endpoints of it. This is SPEN's routeing commitment relating to OHLs and will be pursued through the routeing process for this project.

R4.1.2 With respect to the routeing commitment detailed above, the routeing of the OHL requires in the first instance that the broad parameters of the route are identified. This relates to both technical and infrastructural parameters.

R4.1.3 Assuming the connection will be a 132kV wood pole OHL as described, consideration of the following, more detailed, technical, economic and environmental constraints is relevant, as are the Holford Rules which guide the routeing of OHLs and the siting of substations.

Technical Factors

R4.1.4 The primary fixed constraint for the route of the OHL is the location of the Faw Side Community Wind Farm on-site substation, whose geographical position has been advised by the developers of the wind farm as being 337582, 600844. This forms the start point for any grid connection. The substation is located just outwith an area of commercial forestry on the northern side of the wind farm at Gordon's Knowe, and there is no reason to suggest that the location of the substation will be revised between the Consultation stage (the current stage) and the submission of the Environmental Statement.

R4.1.5 The potential route of the OHL does not pass in close proximity to any proposed wind farms or wind turbines, therefore this is not a constraint to routeing.

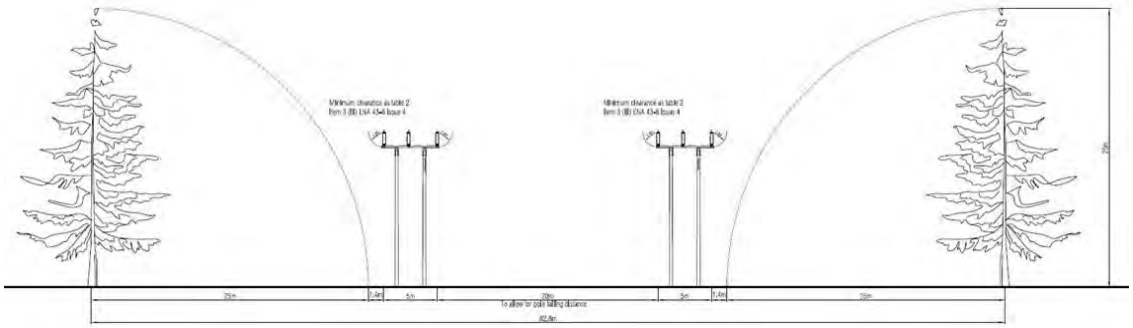
R4.1.6 Wood poles of the design proposed are able to operate and be installed on ground which has less than 22 degrees of slope and in areas absent of rocky outcrops and areas of deep peat. With regards to altitude constraints, Trident wood poles can be utilised above 300m above Ordnance Datum (aOD), although only for short lengths. There are compromises to be made in doing this, however: firstly, the narrower spans required at this altitude mean there is greater potential to create an unacceptable visual effect, and the creation of a 'wirescape' within views becomes more likely; and secondly, the necessity to use the 'H' pole configuration results in greater costs per linear unit. What constitutes a 'short length' varies depending on the specific site circumstances, and for this project anything greater than 1km is considered to be a short length. Also, for this project the absolute maximum in terms of altitude is 350m aOD.

R4.1.7 The restriction on slope relates to construction and operational activities, and at greater altitude the prevailing weather conditions, in particular temperature and wind factors, increase the risk of failure of the infrastructure.

R4.1.8 Given the nature of the connection request made by the wind farm developer, it is important to consider the required offsets should a combined corridor be considered the best routeing option. SPEN require that where two OHLs run side-by-side, there remains a 20m buffer between the line routes to ensure sufficient space for construction and maintenance activities, and to ensure in the case of infrastructure failure there are no health and safety concerns. There is also the need for 25m either side to allow for nearby vertical structures.

R4.1.9 The total width of the corridor, therefore, requires to be a minimum of 82.8m when running through forested areas, and 60m where running through open areas. The general configuration within forested areas is set out on **Image 4.1** below.

Image 4.1: Corridor Width of Twin Wood Pole Line when Running through Forestry



R4.1.10 Power-frequency electric and magnetic fields (EMF) in the vicinity of high-voltage electric power equipment are a concern when considering routeing of OHLs. SPEN ensure at all times that they comply with generally agreed exposure limits, although it should be noted that there are currently no statutory limits that require to be adhered to.

Environmental Factors

R4.1.11 The range of environmental constraints which can affect routeing will vary depending upon the landscape through which the line is to be routed. Section 9 of the Electricity Act is explicit in stating that SPEN must take account of environmental matters, including factors relating to people and the natural environment. As for all development, the first ambition should be to preserve environmental receptors in their original state. However, it is acknowledged that all development will result in some impacts upon the local environment, and that where this is the case, mitigation should be proposed such that impacts are minimised.

R4.1.12 When considering environmental factors, the approach to routeing is sequential in that the most important environmental constraints are considered first, followed by those of lesser, and reducing, importance. The range of environmental factors considered as part of the routeing of the OHLs and includes the following (not listed here in order of importance):

- Landscape and visual matters, including sensitive landscapes and effects upon landscape character;
- Ecological factors, including protected species and habitats;
- Ornithological factors, including breeding and wintering birds and raptors;
- Archaeological and cultural heritage assets, including below-ground assets and those assets whose settings may be affected;
- Hydrological and geological factors, including private water supplies, watercourses, waterbodies and water-based habitats;
- Land uses including mineral operations, agriculture and forestry;
- Recreation and tourism factors, including locally valued facilities; and
- Traffic and transport matters, including access provision and road crossings.

R4.1.13 The range of constraints and their implications for the routeing are investigated in more detail within the routeing process below. Some constraints (such as hitherto unrecognised archaeology) can only be dealt with during the construction stage of the project.

Economic Factors

R4.1.14 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 SPEN 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. In addition, the supposition should be that the OHL is provided as an overhead connection, unless exceptional environmental or technical constraints would mean underground cables would be considered as a preferred design alternative.

The Holford Rules

R4.1.15 It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing overhead transmission lines, 'The Holford Rules', should continue to be employed as the basis for routeing high voltage overhead transmission lines. The Holford Rules were reviewed circa 1992 by the National Grid Company (NGC) plc (now National Grid Transmission (NGT)) as owner and operator of the electricity transmission network in England and Wales, with notes of clarification added to update the Rules.

R4.1.16 A subsequent review of the Holford Rules (and NGC clarification notes) was undertaken by Scottish Hydro Electric Transmission Limited (SHETL) in 2003 to reflect Scottish circumstances. These guidelines for the routeing of new high voltage overhead transmission lines, with the NGC 1992 and SHETL 2003 notes, form the basis for routeing the Faw Side Community Windfarm OHL.

R4.1.17 Whilst the Holford Rules relate specifically to high voltage steel lattice tower lines, essentially they provide clarification as to what is good practice in the locating and designing of any structures within a landscape context, but tailors this to linear infrastructure, and the nature of the elements proposed for a (steel lattice) OHL. It therefore follows that the adoption of the rules is fully justified for the smaller scale of wood pole OHL proposed for this project, where the types of impacts that may arise will be largely similar, although potentially of a more limited extent, to those of the larger structures.

R4.1.18 It is also important to note that the Holford Rules are guidelines only and can be adapted to reflect the characteristics of the area in question, provided that this is justified fully. A summary of the Rules are provided below, with the full version, and accompanying Appendices to the Holford Rules, provided at **Appendix 1** of this report.

Rule 1

Avoid altogether, if possible, the major areas of highest amenity value, 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.

The Routeing Process Applied to this Project

R4.1.19 EDP, in co-ordination with SPEN, and with due regard to the local landscape, have devised a routeing methodology that seeks to ensure SPEN comply with their Statutory Obligations to achieve a balance between technical requirements and environmental protection. The methodology seeks to use the broad principles of the Holford Rules in association with the environmental parameters that are presented within the Study Area.

R4.1.20 The routeing methodology is essentially a number of sequential steps, each of which looks to suggest routeing options or strategies based upon the distribution of environmental and technical constraints presented, and the connection required.

R4.1.21 The key stages of the methodology are as follows:

- Stage 1: Identification of Routeing Study Area, and Environmental and Technical Constraints.
- Stage 2: Identification of Route Corridor Options.
- Stage 3: Appraisal of Route Corridor Options.
- Stage 4: Identification and Appraisal of the Preferred Route Corridor and Route Options.
- Stage 5: Consultation and Refinement.
- Stage 6: Identification of Proposed Route.

R4.1.22 In developing this methodology, a hierarchical approach has been adopted that seeks to offer greatest protection to those most valued receptors, whilst also offering a more modest, yet important, level of protection to those which are considered less sensitive.

Stage 1: Identification of Routeing Study Area, and Environmental and Technical Constraints

R4.1.23 When defining a Study Area for the OHL, the process starts by identifying the notional start- and endpoints for the route, which represent the fixed geographical elements of the route. Where exact locations are known, these should be used in preference. From these points, it is then necessary to establish the extent of the Study Area taking account of the technical, environmental and economic constraints which exist.

R4.1.24 This relates to the aspirations of Rule 1, which state that areas of highest amenity value should be avoided, even if the total mileage of the route is increased. The routeing is not required to take a direct point between the start- and endpoints and must route according to the constraints identified.

R4.1.25 The primary consideration of the range of constraints happens during this stage. Through a combination of Geographic Information Systems (GIS) analysis, field work, consultation and liaison with the wider technical and environmental project team, those constraints considered key in terms of avoidance, are mapped for the Study Area. This will include at least those listed within the note on Holford Rule 1 (see **Appendix 1**).

R4.1.26 Of critical importance during this stage is the identification and understanding of the range of technical constraints that may categorically dictate the routeing of a line. Whereas all environmental constraints are somewhat flexible in their level of constraint, technical constraints commonly are not. Examples include the location of large waterbodies that can't be crossed or existing electrical infrastructure that cannot be moved, rerouted or crossed.

R4.1.27 With reference to Holford Rule 2, it is considered that even small areas of high amenity value should be included within this section as size is not necessarily directly proportionate to importance in environmental terms. The balance between route options and large or small areas of high value will be included as part of subsequent stages in the routeing process.

Stage 2: Identification of Route Corridor Options

R4.1.28 In response to the identification of the key environmental and technical parameters, a number of route corridor options that respond to the locations or the pattern of constraint, and the identified start- and endpoints will be identified. Secondary at this stage is the directness of the route, which although a consideration borne out by Holford Rule 3, is something that has to be balanced technically and environmentally throughout the routeing process. It may be that the technical and environmental parameters are such that just a single corridor and route is identified at this stage, with this particularly common for shorter routes.

R4.1.29 There is no definitive width for the routeing corridor and these will be as broad or as narrow as the prevailing baseline dictates. The Preferred Route (and ultimately the Proposed Route) will, notwithstanding the emergence of further constraints information, fall within one of these corridors. The aim of identifying potentially wide corridors is to provide a broadly compliant route, but one that contains flexibility for selecting a range of route options.

Stage 3: Appraisal of Route Corridor Options

R4.1.30 Dependent on the size of the Study Area and distribution of environmental and technical constraints, a wide range of potential route options may emerge from Stage 2. In order to focus the

identification of a Preferred Route, and to avoid unnecessary detailed routeing analysis during subsequent stages, it is appropriate to appraise the route corridors in terms of their wider environmental acceptability and to carry out a comparative exercise to appraise their relative potential, with a focus on the landscape and visual acceptability of the options as directed by Holford Rules 3 to 7. It may be that all corridors exhibit a comparative level of potential. However, this is rare, especially when appraised against both the constraints identified in Stage 1 and the landscape and visual acceptability of the corridor.

R4.1.31 The conclusion of this stage will be the emergence of a 'Preferred Route Corridor', somewhere within which, the Preferred Route (and ultimately the Proposed Route) will be defined. Whilst this route corridor will be defined based upon the available data to date, further consultation or technical matters may emerge which render the Preferred Route Corridor no longer the best option (for example the emergence of hitherto unknown technical constraints). Where this occurs, the comparative analysis carried out will have defined the 'second best' alternative corridor to pursue.

Stage 4: Identification and Appraisal of the Preferred Route Corridor and Route Options

R4.1.32 This stage takes the results of the evaluation undertaken in Stage 3 to identify and illustrate the Preferred Route Corridor. Unless further environmental or technical constraints emerge subsequent to, or during this stage, this route will be that taken forward to the formal consultation stage.

R4.1.33 Following the identification of the Preferred Route Corridor, it is then necessary to identify where, within this corridor, the potential OHL route options exist. There may only be a single route within a corridor, or there may be several options, or there may be a single route, with options at different points along its length. This will depend on two factors: firstly, the width of the corridor, and secondly the distribution of landscape elements and constraints which guide the route.

Stage 5: Consultation and Refinement

R4.1.34 Consultation on the Preferred Route is perhaps the key part of identifying the most technically and environmentally acceptable route option. Whilst the analysis of route options undertaken up to this point is based upon all available technical and environmental constraints and consultation with statutory bodies, consultation with a broader range of stakeholders, including the public, often raises further constraints which were hitherto unidentified, but which are important in the context of routeing.

Stage 6: Identification of Proposed Route

R4.1.35 Following the consultation undertaken at Stage 5, which for this project includes the issuing of this Routeing Consultation Document, any changes required to the Preferred Route are evaluated and accepted if found to be acceptable in general routeing terms. With the changes incorporated, the route then forms the Proposed Route which becomes the subject of the environmental appraisal as part of any future planning submission.

R5. Stage 1: Identification of Routeing Study Area & Environmental and Technical Constraints

R5.1 The Routeing Study Area

R5.1.1 As shown on **Figure 3**, the routeing Study Area comprises a swathe of landscape comprising approximately 27 sq.km that lies predominantly within the Scottish Borders with a small area to the south within Dumfries and Galloway. The landscape is largely rural in nature, with only limited human habitation within the upland areas, and a greater focus of habitation along the A7 to the east, and at Teviothead to the north.

R5.1.2 The Study Area is roughly split into three main sub-areas. The eastern portion comprises the steeply incised valley containing the line of the A7 as it runs between Langholm and Hawick. The existing V-Route OHL runs along the A7, often criss-crossing the road as it threads its way through the landscape. Moving west, there is then an area of high ground which rises to nearly 600m aOD, and which comprises open moorland with occasional forestry blocks on its western flanks. Beyond this, the landscape is then characterised by the river valleys of the Limiecleuch Burn and the upper River Teviot. A number of farmsteads are located here, including Lymiecleuch, Blackcleuch and Commonbrae. A single minor road runs along the ridge between the two river valleys, providing access to the centre of the Study Area.

R5.2 Identification of Strategic Environmental and Technical Constraints

R5.2.1 Having established the start- and possible endpoints for the OHL and having identified within the baseline description the range of highest value (and lesser value) constraints, it is now possible to look at the potential route options that exist from the Faw Side Community Wind Farm to V-Route in relation to these. **Figure 4** illustrates those areas of highest environmental value across the Study Area, which include the following:

- Listed buildings;
- The Langholm Hills Regional Scenic Area;
- Areas of ancient woodland;
- Functional flood plains of the existing watercourses
- Ecological designations (SACs and SSSIs), in particular those centred on the watercourses, which feed into the River Tweed; and
- Important Areas of Peat.

R5.2.2 Also mapped are the following technical constraints, as described previously:

- Areas with a slope gradient of greater than 15 degrees ('soft' slope constraint);
- Areas with a slope gradient of greater than 22 degrees ('hard' slope constraint);
- Areas above 300m elevation ('soft' elevation constraint); and
- Areas above 350m elevation ('hard' elevation constraint).

R5.2.3 These constraints include those listed within the Holford Rules (Appendix B), and also a number of other constraints important in the context of the local landscape.

R5.2.4 Whilst the above form the documented constraints evident across the Study Area, other key components in a route's acceptability are those pertaining to potential landscape and visual effects. In identifying a preferred route, it is essential that landscape and visual effects are considered, and in line with EDP's general approach to the development of renewable energy, the routeing of the OHL has followed a landscape-led approach whereby the technical and environmental constraints are considered alongside those of landscape sensitivity and visual acceptability. The analysis of the landscape and visual issues is undertaken during the route corridor appraisal stage (Stage 4).

R5.2.5 This approach ensures all factors are considered, the highest areas of environmental value are avoided or addressed where avoidance is not possible, and the routeing parameters advocated by the Holford Rules are applied.

R6. Stage 2: Identification of Route Corridors and Route Options

R6.1 Introduction

R6.1.1 Based upon the areas of highest environmental value identified in the previous section and the distribution of landscape and other features, there is really only a single direction, or broad area, where routeing of the OHL would be appropriate or achievable; this is the area immediately to the north of the Faw Side Community Wind Farm, extending as far as Teviothead, as shown on **Figure 3**. To the east of the substation, the landscape is both too elevated and too steep, with too much class 1 peat to be considered for routeing, but on the basis this was the original route to the original connection point, it has been included as a corridor for completeness (route corridor D).

R6.1.2 Within the area to the north, there are a further three route corridor options, which are illustrated on **Figure 5**. These corridors are distributed across the Study Area and pass through a variety of different land uses. This part of the Study Area is extensively rural and contains little in the way of built development, save for isolated farmsteads and other dwellings. The number of routes is limited by the extensive areas above 300m and 350m aOD and the extent of slopes greater than 15 and 22 degrees.

R6.1.3 It is important to note that the route 'edges', as mapped, do not represent fixed boundaries to routeing. The identification of routes was undertaken to identify the broad geographic area within which routeing of an OHL was considered to be preferable, relative to other geographic areas.

R6.1.4 Each of the route options was given a reference: A-D. All route options have the same starting point of the proposed Faw Side Community Wind Farm substation; however, there may be some variance at the termination point dependent on to which V-Route tower a connection would be most practical and achievable. The route corridor Options are shown on **Figure 5**.

Route Corridor A

R6.1.5 Route corridor A runs immediately north from the proposed wind farm substation site taking in the farmsteads of Commonbrae and Blackcleuch and the areas of commercial forestry which exist here forming an unbroken area crossing the River Teviot. The corridor then then turns north-east following the valley of the River Teviot for some 3km, before passing Watch Knowe and Teviothead on its eastern edge, with these dwellings forming the southern part of the settlement of Teviothead. The corridor then continues north before terminating at the very northern tip of the Study Area near to the Falnash Burn. **Image 6.1** below shows a typical part of this corridor.

Image 6.1: Route Corridor A

Route Corridor B

R6.1.6 Route corridor B runs north from the substation and follows the valley of the Limiecleuch Burn, which sits between the higher ground of Limie Hill and Limiecleuch Hill to the east and the spur of higher ground – Caerlan Rig – to the west. Approximately 2.5km into the valley, the corridor includes the farmstead of Lymiecleuch, which is accessed via a track from the minor road which runs along Caerlan Rig. The valley becomes more incised approximately 0.8km north of Lymiecleuch before opening out again as it reaches the A7 and the Limiecleuch Burn's confluence with the Frostlie Burn. At the northern end the corridor is in close proximity to the A7 and also the settlement of Teviothead.

Image 6.2: Route Corridor B

Route Corridor C

R6.1.7 Route corridor C runs north from the proposed substation location and after descending towards Commonbrae and Blackcleuch, follows the higher ground of Caerlan Rig between the two valleys of the River Teviot and Limiecleuch Burn. This spur of higher ground has a minor road (a dead end) which follows the ridge, and runs in close proximity (for most of its length) with a small scale OHL, as shown on **Image 6.3** below.

R6.1.8 It does so in a north-east direction. It passes Teviothead to the most northern part of the Study Area culminating at the Falnash Burn.

Image 6.3: Route Corridor C

Route Corridor D

R6.1.9 Route corridor D runs immediately east from the proposed substation location and rises up the western flank of Comb Hill. As can be seen by **Figure 6**, this area is subject to large areas above 350m aOD, and also areas with a gradient above 22 degrees, both of which are considered 'hard' constraints to routeing OHLs of this type. With reference to **Figure 7**, the 'soft' constraints of elevation and slope also place a considerable constraint on the potential corridor, cumulatively covering the vast majority of it.

R6.1.10 The reason for including this route given these constraints is that the original contracted connection point was V-Route tower 193, which as **Figure 1** shows, lies due east of the wind farm connection point. This V-Route connection point was selected at the offer stage to the developer on the basis of a desktop exercise and plotting the shortest, and most logical looking, point of connection, without taking account of the overriding constraints now being assessed.

Image 6.4: Route Corridor D

R6.2 Environmental Baseline of Study Area

Introduction

R6.2.1 This section reviews the prevailing environmental baseline of the Study Area, and in so doing provides a strategic understanding of the key environmental constraints which have guided the identification of the Preferred Route. Key figures are provided as **Figures 6** to **18**.

Landscape and Visual

Planning Context and Landscape Designations

R6.2.2 There are few landscape-related designations, reflecting the diversity and quality of landscapes found within the Study Area. These are set out and described below and illustrated on **Figure 4**, and in detail on **Figures 9** to **12**.

R6.2.3 Regional Scenic Areas (RSAs) are locally designated scenic areas (i.e. designated by the Local Authority) and can be found in a single location to the south of the Study Area. The RSA is within Dumfries and Galloway (D&G) and is covered under D&G Policy which states that the siting and design of development should respect the special nature of the area, and that development would only be permitted where the landscape character and scenic interest would not be adversely affected, or where there is a specific need for the development at that location which could not be located in a less sensitive area. The Langholm Hills RSA is found in the very south of the Study Area and, given the relative locations of the start- and endpoints of the grid connection, will not constrain development to the north. There is no corresponding designation in the Scottish Borders area.

R6.2.4 There are no other area-based landscape designations, such as National Parks, Areas of Great Landscape Value (AGLV) or National Scenic Areas (NSAs) within the Study Area, suggesting that in general there is no particularly elevated landscape sensitivity to constrain development.

R6.2.5 There are no Gardens and Designed Landscapes (GDLs) within the Study Area, and none within close proximity.

Topography

R6.2.6 Topography within the Study Area is a combination of upland types as defined within the Borders Landscape Character Assessment (generally orientated north-east to south-west) and river valleys which run along the A7 in the eastern part of the Study Area.

R6.2.7 The elevation range within the valley is c.160m aOD in the north (near Teviothead) to c.260m aOD in the south. To the west of the valley, the elevation of the 'uplands' extends to around 595m aOD at Wisp Hill, in the extreme southern part of the Study Area, and then generally falls to the north towards Teviothead. Peaks in this area include Comb Hill (513m aOD), Limiecleuch Hill (360m aOD), Blackcleauch Rig (355m aOD) and a number of smaller bluffs which run between the valleys of the Limiecleuch Burn and the River Teviot.

Landscape Character

R6.2.8 Landscape character within the Study Area is described within the SNH '2019 Landscape Character Type map and associated Landscape Character Type Descriptions' study. This study supersedes the 1998 study, which also referenced Regional Character Areas, which have been discontinued. The landscape character of the Routeing Study Area is shown on **Figure 8**.

LCT 93 Southern Upland with Scattered Forest – Borders

R6.2.9 This landscape character type (LCT) covers the vast majority of the Study Area. As stated within the assessment, the Southern Uplands with Scattered Forest – Borders Landscape Character Type is an upland landscape characterised by large-scale, rolling, heather and grassland covered hills. The key characteristics of this LCT are described as follows:

- *"Large-scale rolling landform with higher dome or cone-shaped summits.*
- *Significant areas of peatland and heather moorland.*
- *Mosaic of grassland, bracken and rushes on lower ground.*
- *Locally-prominent scattered large areas of forestry.*
- *Degree of remoteness, wild character and grandeur of scale unique within the region."*

R6.2.10 They occur in three locations: east of the Broad Law group (Elibank, Traquir and Ettrick Forest areas), Cauldcleuch Head hill group, and near Dun Knowe. There are two within the Study Area: Cauldcleuch Head and Dun Knowe.

R6.2.11 Where these sub-types differ in character from the general characteristics, this is described as follows:

"The Dun Knowe group and the area east of the Broad Law group, and the northern part of the Cauldcleuch Head hill group, form part of the drainage basin of the River Tweed. The southern part of the Cauldcleuch Head hill group drains southwards into the River Esk. There are valley reservoirs and lochs which add diversity."

"In the Cauldcleuch Head Group hill peaks mainly range between 300 and 600 metres. The southern area of this hill group has gently to moderately sloping heather moor and grassland in the south. Extensive conifer forests are prominent in views to the adjacent Southern Uplands with Forest – Borders Landscape Character Type."

"The Dun Knowe hill group has lower summits, ranging mainly between 300-470 metres, and there are scattered, small, locally prominent small lochs. To the east of Dun Knowe there is an extensive

conifer forest, and extensive views to adjacent Southern Uplands with Forest Landscape Character Type at Craik Forest can be gained."

LCT 96 Southern Upland with Forest – Borders

R6.2.12 This LCT covers part of the western Study Area and is described as a distinctive variant of the Southern Uplands LCT, but dominated by forest cover. The key characteristics of this LCT are described as follows:

- *"Large scale rolling landform with higher dome or cone-shaped summits.*
- *Dominant coniferous forest cover characterised by Sitka spruce plantations with occasional areas of pine and larch.*
- *Dispersed settlement pattern of farmsteads and forestry buildings, mainly within sheltered valleys.*
- *Scattered pockets of past landuse from prehistoric to post-medieval times.*
- *Simple, uniform character.*
- *Strong sense of enclosure, quietness and tranquillity."*

LCT 177 Southern Uplands – Dumfries & Galloway

R6.2.13 This LCT comprises only a very small part of the Study Area and is notionally described as being an upland area ranging between 200 and 500m, characterised by large smooth domed or slightly conically shaped hills. The documented key characteristics are described as follows:

- *"Large, smooth dome/conical shaped hills, predominantly grass-covered.*
- *Open and exposed character except within incised valleys.*
- *Dramatically sculpted landforms and awe-inspiring scale.*
- *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.*
- *Legacy of lead and other mining activity, with extensive archaeological remains around the former mining village of Wanlockhead.*
- *Wind farms locally characteristic, away from the more dramatic, scenic and sculptural slopes and skylines."*

LCT 117 Pastoral Upland Fringe Valley

R6.2.14 This LCT comprises the extreme northern extents of the Study Area, around the settlement at Teviothead, and is summarised as a diverse valley type of medium scale. The documented key characteristics are described as follows:

- *"Medium scale pastoral valley with flat floor enclosed by upland fringe pastures, often with rough grassland and moorland covered hills above.*
- *Smooth large scale landform modified in places by bluffs and moraine on valley floor, scree slopes or rock outcrops on valley sides.*
- *Narrow, often wooded tributary side valleys.*
- *Broadleaf woodlands and scrub on bluff slopes and scattered trees along river banks, occasional coniferous plantations and shelterbelts on valley sides.*

- *Valley floor pastures enclosed by drystone dykes with occasional hedgerows, interspersed with occasional patches of scrub, coarse grass and rushes.*
- *Scattered villages, farmsteads and mansion houses with policy woodlands."*

LCT 166 Upland Glens – Dumfries & Galloway

R6.2.15 This LCT comprises a very small part of the south-east of the Study Area, centred on the A7 and the Ewe Water. The documented key characteristics are described as follows:

- *"Deep u-shaped (and partially v-shaped) valleys with steep sides and narrow flat valley floors.*
- *Enclosed and often narrow, contained by steep sides which rise to form irregular ridgelines*
- *Features of traditional upland farming, with isolated farmsteads surrounded by trees, small to medium sized fields and enclosures with drystone dykes, fanks, stells and shelterbelts.*
- *Rough grassland and moor above improved pastures.*
- *Medium scale conifer forests (or parts of larger forests) on the glen sides.*
- *Single track road access."*

R6.2.16 Given the distribution of these LCTs, as illustrated on **Figure 8**, it is important to consider the susceptibility of those LCTs likely to be impacted by the Proposed Development. This consideration excludes LCTs 166 and 177 due to their very small proportion of the Study Area and their juxtaposition with the key elements (i.e. the wind farm and connection points).

R6.2.17 According to the Guidelines for Landscape and Visual Impact Assessment (GLVIA3), susceptibility of the landscape resource is the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.

R6.2.18 In this respect, key factors affecting the susceptibility for OHLs (of any scale), and what may constitute a higher or lower susceptibility, are considered in the table below, and reflect the different categories within the published SNH landscape assessment.

Table 6.1: Susceptibility Factors for OHL Development

Criteria	Higher Susceptibility	Lower Susceptibility
Landform	Complex topographical situation in which skylining becomes more challenging, or where topography provides character to views.	Simple topography where skylining is more available and where monotony of form provides a simpler backdrop.
Landcover	Complex landcover/pattern in which OHL development might be contrasting or visually prominent.	Simple landcover/pattern in which linear infrastructure can 'fit' in landscape terms.
Settlement and Human Influences	Lacking in other infrastructural elements which provide already altered context. Presence of intensive human influence or settlement, in which OHLs would be noticed by many people.	Lack of intensive human influence, or where other infrastructure presents altered context and character. More pastoral landscapes.
Perception	Increased sense of visual attractiveness where OHL development would contrast with remoteness and perceptual factors.	Reduced sense of visual attractiveness where OHL development would not contrast with remoteness and perceptual factors.

Criteria	Higher Susceptibility	Lower Susceptibility
Scale	Small scale, pastoral.	Large scale.

R6.2.19 On the basis of the above factors, the table below examines the three LCTs comprising the majority of the Study Area in terms of landscape susceptibility. It does so with knowledge of the specific (rather than general) characteristics observed during fieldwork.

Table 6.2: Susceptibility Consideration of Host LCTs

LCT	General and Specific Characteristics	Susceptibility
LCT 93 **Southern Upland with Scattered Forest – Borders**	• Large-scale rolling landform with higher dome or cone-shaped summits. • Significant areas of peatland and heather moorland. • Mosaic of grassland, bracken and rushes on lower ground. • Locally-prominent scattered large areas of forestry. • Degree of remoteness, wild character and grandeur of scale unique within the region. • Distinct variation in scale – some larger hills and moorland areas. • Proximity in north to settlement and LCT 117 which influences character at transition. • Scattered farmsteads and dwellings. • Prominent river valleys. • Small scale OHL development evident. • Future presence of Faw Side wind farm.	**Landform** Relatively simple topography and landform suggests lower susceptibility. Some areas of higher susceptibility where the LCT follows river corridors due to enclosure. **Landcover** Simple landcover suggests lower susceptibility. **Settlement and Human Influence** Given isolated pockets of farmstead and individual dwellings, lower to medium susceptibility. **Perception** Generally medium levels of remoteness and presence of (future) wind farm and existing OHLs suggests medium susceptibility. **Scale** Large scale suggests lower susceptibility. Overall, the LCT is considered to have a **lower** susceptibility due to the large scale, simple landform and presence of existing and future infrastructure elements.
LCT 96 **Southern Upland with Forest – Borders**	• Large scale rolling landform with higher dome or cone-shaped summits. • Dominant coniferous forest cover characterised by Sitka spruce plantations with occasional areas of pine and larch. • Dispersed settlement pattern of farmsteads and forestry buildings, mainly within sheltered valleys. • Scattered pockets of past landuse from prehistoric to post-medieval times • Simple, uniform character. • Strong sense of enclosure, quietness and tranquillity. • Some individual dwellings within sheltered valleys on the periphery of the LCT.	**Landform** Relatively simple topography and landform suggests lower susceptibility. **Landcover** Simple landcover predominated by forestry suggests lower susceptibility. **Settlement and Human Influence** Very isolated pockets of farmstead and individual dwellings suggests lower to medium susceptibility. **Perception** Generally high levels of remoteness suggests higher susceptibility. **Scale** Large scale suggests lower susceptibility. Overall, the LCT is considered to have a **lower** susceptibility in the main due to the large scale, simple landform and presence of existing and future infrastructure elements. Some areas of **medium** susceptibility nearer isolated and enclosed pockets.

LCT	General and Specific Characteristics	Susceptibility
LCT 117 **Pastoral Upland Fringe Valley**	• Medium scale pastoral valley with flat floor enclosed by upland fringe pastures, often with rough grassland and moorland covered hills above. • Smooth large scale landform modified in places by bluffs and moraine on valley floor, scree slopes or rock outcrops on valley sides. • Narrow, often wooded tributary side valleys. • Broadleaf woodlands and scrub on bluff slopes and scattered trees along river banks, occasional coniferous plantations and shelterbelts on valley sides. • Valley floor pastures enclosed by drystone dykes with occasional hedgerows, interspersed with occasional patches of scrub, coarse grass and rushes. • Scattered villages, farmsteads and mansion houses with policy woodlands. • More expansive valley near to Teviothead due to meetings of watercourses. • Extensive OHL development along valley floor (V-Route). • Transitional zone between adjacent LCTs.	**Landform** Relatively simple topography and valley sides make backclothing simple, suggesting lower susceptibility. **Landcover** Complex landcover, especially so given transitional nature in this area, suggests medium susceptibility. Some expansive areas with some more enclosed. **Settlement and Human Influence** Relatively intensive human influence, although also existence of prominent OHL development. Overall lower to medium susceptibility. **Perception** Generally low levels of remoteness and existing OHL development suggests lower susceptibility. **Scale** Medium scale suggests medium susceptibility. Overall, the LCT contrasts areas of existing OHL development with intensive human influence and settlement. Road routes are prominent (along the V-Route), and the LCT here forms part of the transitional zone between LCT 117 and LCT 93. Some areas of **lower** susceptibility and some areas of **medium** susceptibility are evident.

Land Use and Local Character

R6.2.20 The Study Area comprises a landscape which is transitionary between the lower-lying valleys and the upper moorland, and as such displays characteristics of both land uses. The southern end of the Study Area comprises the southern edge of the proposed Faw Side Community Wind Farm and areas of coniferous plantation forestry, interspersed with areas of moorland habitat and grazing land. **Image 6.5** below shows the character of the landscape in this area.

Image 6.5: View from the proposed substation location, looking north.

R6.2.21 Although this area tends to be largely remote in its character, there are pockets of (normally) lower-lying ground where habitation is evident, such as at Blackcleuch and Commonbrae. There are more remote areas further to the south as well, such as at Merrylaw and Giddenscleuch. Where this habitation has developed, the land use tends to echo this, with a greater propensity of pastoral landscape features, and a variety of built form.

R6.2.22 Within the intervening part of the Study Area, the proximity to areas of habitation starts to influence the landscape. The southern extents of Teviothead extend onto the elevated ridge between the two watercourse valleys, and farmsteads and farm tracks become more evident in views. The notable farmstead is Lymiecleuch, which sits on the Limiecleuch Burn approximately halfway between the substation location and the A7. **Image 6.6** below shows this farmstead, and its valley location.

Image 6.6: Lymiecleuch Farm

R6.2.23 Within the opposite valley – containing the River Teviot – the landscape is again very remote, with little or no habitation north of Blackcleuch. This results in there being a long stretch of largely natural landscape before the valley opens out at Teviothead.

R6.2.24 Further north, as the Study Area is more aligned on the valley landscape and the road corridor of the A7, a greater extent of settlement, infrastructure and other human influences ensure a different character is prevalent. There is a greater prevalence of deciduous woodland, small and medium scale enclosure and individual mature trees. A greater number of farmsteads, individual houses and settlement is evident, and the L7 towers of the V-Route OHL are a prominent local feature running along the valley. **Image 6.7** below shows a typical view across the northern part of the Study Area.

Image 6.7: Image looking towards Teviothead from near the Parish Church.

Visual Issues

R6.2.25 For there to be visual effects there have to be visual receptors, usually people whose visual amenity may be affected by a proposed development, either in their homes or outside, whether travelling or recreating, or simply enjoying the view.

R6.2.26 Generally, topography dictates the nature of views for OHLs, especially in upland, mountainous or roiling landscapes in Scotland. Panoramic views can be obtained from high peaks, while views from within valley areas are constrained and dominated by upland slopes or existing vegetation. The intervisibility of lowland and highland areas contributes to some of the key characteristics of the scenic qualities of the area. Forestry has a significant impact on the availability of views from many upland areas, and from lowland areas may diminish the quality of some views due to the monotonous character of commercial plantation forestry.

R6.2.27 Within the Study Area, there are very few settlements, with Teviothead being the only named conurbation on Ordnance Survey (OS) maps. There are a number of other locations where more than one farmstead or residential property are grouped to form a potential receptor group, with key ones being as follows (and as shown on **Figure 3**):

- Dwellings at Blackcleuch and Commonbrae, towards the southern extent of the Study Area;
- Dwellings at Watchknowe and Carlenrig in the northern part of the Study Area; and

- Properties at Falnash in the north-western part of the Study Area.

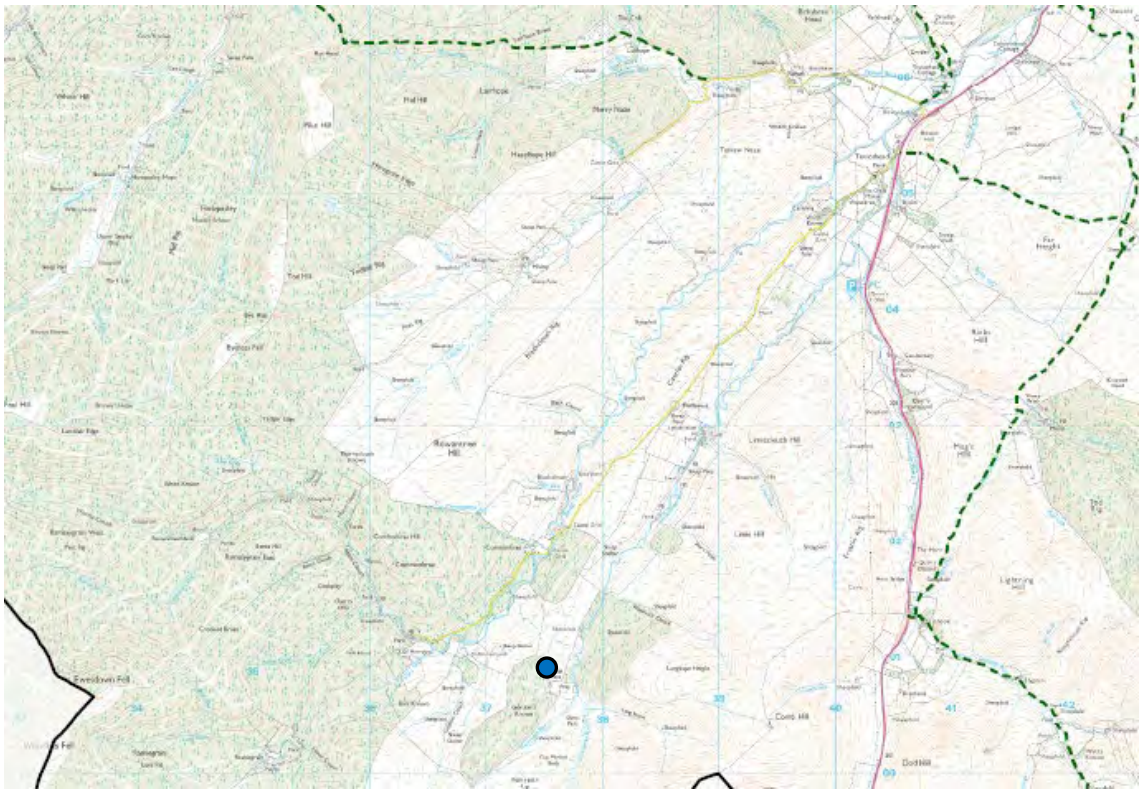
R6.2.28 These groups of dwellings tend to be located within the valley bottoms and are well-related to the minor road routes through the area, whilst some isolated and outlying farms and dwellings can also be found on the lower slopes of surrounding hills. Notable ones include Limiecleuch, Giddenscleuch and Merrylaw.

R6.2.29 Road routes through the Study Area are generally limited to valley bottoms or sides. There is a single A road through the Study Area, the A7 between Langholm and Hawick. This runs through the eastern part of the Study Area and follows broadly the line of the V-Route OHL. A number of minor (unclassified) routes run west and south-west from Teviothead, with both of these being no-through roads offering access to the isolated properties and dwelling groups in the Study Area.

R6.2.30 The Study Area is not particularly popular as a recreational resource. Walking, cycling, fishing and shooting are a few of the popular activities within the area, although there are no named trails or long-distance footpath routes (such as the Southern Upland Way). Under the Land Reform (Scotland) Act 2003, everyone has the statutory right of access to all land and inland waters (unless specifically excluded by the Act), and although there are no footpaths or bridleways marked on the 1:25,000 scale map (public rights of way are unaffected by the Act), local councils have a duty to produce Core Paths plans which represent those paths that councils consider to be key in their areas. Councils have a duty to ensure these routes are adequately signed and in a reasonable condition. Both councils within the Study Area have mapped these routes, which are available to view online.

R6.2.31 The Core Paths within, or in proximity, to the Study Area are shown on **Image 6.8** below, which is replicated from 'Scottish Borders Adopted Core Path Plan Area 57'.

Image 6.8: Core Paths (green dashed lines) in Area 57 (Faw Side substation location indicated).



Residential Amenity (including Noise)

R6.2.32 Residential amenity effects relate to the potential effects upon people when they are at their place of residence. Common environmental effects include noise effects from the OHL or other infrastructure (such as substations), visual effects relating to the construction of steel towers or other infrastructure or general interference of people when at home (for example land use or traffic). Rule 7 of the Holford Rules deals specifically with residential amenity, and the notes on this rule are as follows:

"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 effects on the amenity of existing development and on proposals for new development.

c) When siting substations take account of the effects 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."

R6.2.33 As effects on views and visual amenity are experienced by people as receptors, receptors at their homes are often judged to be most susceptible to changes in views and visual amenity. Therefore all individual settlements and residential properties within the Study Area were identified.

R6.2.34 Individual residential properties were mapped using OS AddressBase Plus® data, and a 150m radius applied around each property to reflect the principles within the 'Further Notes on Clarification to the Holford Rules a) (see **Appendix 1**)' (as shown on **Figure 4**). The general location of properties was verified in the field and the data set updated accordingly. Where possible, route options were identified which avoided encroaching on the trigger for consideration zone. In addition, route options sought to avoid principal views from residential properties, informed by observations made during fieldwork which considered the orientation of properties, the likely availability of views from the property and its curtilage and the presence of intervening screening (e.g. localised landform, woodland, forestry and vegetation, built form and other landscape features).

Nature Conservation (Ecology, Ornithology and Biodiversity)

R6.2.35 Nature conservation designations and certain species receive legal protection under various national and international legislative instruments. In addition, there are other habitats and species that do not receive legal protection, but which are notable owing to their conservation status. The presence of such nature conservation interests within the Study Area, as derived from the desk study and summarised below, has been used, in combination with professional judgement, to inform the most sensitive routing of the overhead grid connection through the landscape.

R6.2.36 Sites of nature conservation value and pertinent protected or notable species and habitats present within the Study Area have been identified through a desk-based assessment of on-line resources, the Faw Side Community Wind Farm Environmental Statement 2019[3], a site walkover in August 2019 and information derived from statutory and non-statutory bodies, including SNH and The Wildlife Information Centre (TWIC). Information gathered from TWIC included non-statutory sites and protected species records within the Study Area, which covered all four route options and the surrounding 250m, i.e. those ecological features most likely to be impacted by the grid connection. This radius was deemed appropriate for the purposes of the routeing exercise. Statutory designated sites were identified within 10km of the Study Area.

[3] https://www.fawsidewindfarm.co.uk/Planning_Documents accessed 13 May 2020

Nature Conservation Designations

R6.2.37 The Study Area contains one site that has been designated for nature conservation value at an international level: the River Tweed SAC and SSSI. This designated site runs through the Study Area along two channels (in the form of the River Tweed tributaries, the River Teviot and the Limiecleuch Burn), either side of the central ridge. The SAC is designated for representing a "*water course of plain to montane levels with the* Ranunculion fluitans *and* Callitricho-Batrachion *vegetation*" and for supporting populations of Annex II species (Atlantic salmon (*Salmo salar*) and otter (*Lutra lutra*)). Three features are also listed that are not a reason for designation, namely brook, river and sea lampreys (*Lampetra planeri*, *L. fluviatilis* and *Petromyzon marinus*). Two further international sites are located within 10km of the Study Area. Namely:

- Langholm–Newcastleton Hills Special Protection Area (SPA)/SSSI, located approximately 6.5km to the south-east at its closest point. Designated for its large population of breeding hen harrier (*Circus cyaneus*); and,
- Whitlaw and Branxholme SAC, located approximately 4.5km to the north-east at its closest point. Designated for its "*transition mires and quaking bogs*" and the Annex II species, slender green feather-moss (*Drepanocladus vernicosus*).

R6.2.38 A single site designated at the national level is present within the Study Area, the River Tweed SSSI, which is coincident with the SAC of the same name. It is designated for its habitat (trophic range river), its plant assemblage and its populations of salmon, lamprey, otter, beetles and flies.

R6.2.39 There are no locally designated sites (Local Biodiversity Sites) within the Study Area.

Species of Nature Conservation Importance

R6.2.40 A number of species sensitivities present within the Study Area have been identified through the course of the desk study and are briefly summarised below. Owing to the confidential nature of many of these records, they have not been presented on a figure but have been used by the project team to inform both the routeing selection process and scope of future survey works that are likely to be required.

TWIC Records

R6.2.41 Breeding locations for a number of birds of conservation importance (i.e. birds that are protected under Schedule 1 of the Wildlife and Countryside Act (1981, as amended) (WCA) have been received within the Study Area including peregrine (*Falco peregrinus*), crossbill (*Loxia curvirostra*), barn owl (*Tyto alba*), kingfisher (*Alcedo atthis*) and black grouse (*Tetrao tetrix*). Other birds of conservation importance recorded within the Study Area and considered pertinent to the proposals include short-eared owl (*Asio flammeus*) and curlew (*Numenius arquata*). Despite the lack of records, there is also potential for other raptor species to be present, particularly hen harrier (*Circus cyaneus*), for which the Langholm–Newcastleton Hills SPA is designated.

R6.2.42 Non-avian protected and notable species records within the Study Area include Atlantic salmon and European eel (*Anguilla anguilla*), red squirrel (*Sciurus vulgaris*), badger (*Meles meles*), otter and various bat species. Records for these species are widely spread across the Study Area, with otter records on both river corridors. Badger records are limited to the far south-east of the Study Area, although it is considered possible that they are present and unrecorded elsewhere due to the remote nature of the Study Area.

Records Relating to the Faw Side Community Wind Farm Application

R6.2.43 Extensive records were obtained from the Faw Side Community Wind Farm ecology and ornithology Environmental Statements (ES)[3]. These included many species for which TWIC held records (such as red squirrel, otter, peregrine and black grouse), but also included certain species of pertinence for which records were not held. The ornithological surveys on the site recorded species listed on Schedule 1 of the WCA (whooper swan (*Cygnus cygnus*), goshawk (*Accipiter gentilis*), hen harrier, osprey (*Pandion haliaetus*), peregrine, red kite (*Milvus milvus*), merlin (*Falco columbarius*) and black grouse) and non-Schedule 1 species of conservation concern (short-eared owl, barnacle goose (*Branta leucopsis*), greylag goose (*Anser anser*), pink-footed goose (*Anser brachyrhynchus*) and curlew).

R6.2.44 Ecology surveys undertaken to inform the Faw Side Community Wind Farm ecology and ornithology ES[3] recorded extensive evidence of otter and red squirrel throughout the wind farm site and occasional reptiles (slow worm (*Anguis fragilis*), adder (*Vipera berus*) and common lizard (*Zootoca vivipera*)). It is considered likely that all of these species will be present within the Study Area, given their presence in the wider landscape and the presence of suitable habitat.

R6.2.45 An anecdotal record was provided by a local gamekeeper of goshawk breeding in the woodland just north of the substation location.

Habitats of Nature Conservation Importance

R6.2.46 Bog and ancient woodland inventories available from SNH have been used to identify and avoid, where possible, sensitive habitats within the Study Area. The principle habitats considered were those of nature conservation value as reflected in their inclusion under the UK Biodiversity Action Plan (BAP).

R6.2.47 The Study Area comprises predominantly coniferous forest and grassland bisected by watercourses. There is no known bog habitat along the Teviot valley, although the Phase 1 plan for the Faw Side Community Wind Farm shows areas of modified bog along the ridge south of Limiecleuch Burn. Furthermore, intact blanket bog is present on Limie Hill, a short distance to the south. Given the presence of blanket bog to the south, it is considered possible that further bog exists within the Study Area.

R6.2.48 Large areas of unimproved acid, neutral and marshy grassland have also been recorded to the south of the Study Area and within the Teviot and Limiecleuch valleys. Although detailed habitat mapping of the Study Area was not undertaken, given its location and proximity to these areas of grassland, it is likely to support such habitats.

R6.2.49 Areas of heather moorland are present across the peaks of Limie Hill and Comb Hill, in the south of the Study Area and a small area of ancient woodland exists along the ridge, south of the road leading south-east out of Teviothead, within corridor of Routes B and C.

Archaeology and Cultural Heritage

R6.2.50 The archaeology and cultural heritage of an area comprises archaeological sites, historic buildings and other features in the landscape that have the capacity to provide information about past human activity, or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest may also be informed by their 'setting' within a wider landscape.

R6.2.51 National planning policy and guidance recognises that Scotland's cultural heritage is a finite and non-renewable resource that needs to be protected, conserved and enhanced accordingly.

R6.2.52 Digital baseline information on the designated cultural heritage resource has been sourced from the Historic Environment Portal and the National Record of the historic environment in Scotland

(Canmore) databases curated by Historic Environment Scotland as well as through reference to the Scottish Borders LDP. Baseline information relating to non-designated archaeology and historic sites has also been obtained from the Dumfries and Galloway Historic Environment Record and the Scottish Borders Historic Environment Record.

R6.2.53 There are only two high value archaeology and cultural heritage-related designations within the Study Area which require consideration at the routeing stage of the proposals for the new OHL. These are set out and described below and illustrated on **Figure 4.**

R6.2.54 Scheduled Monuments (SMs) are designated under the Ancient Monuments and Archaeological Areas Act 1979 and are defined as monuments of national importance whose preservation *in situ*, and within an appropriate setting, is important to retain. Within the Study Area, there are no scheduled monuments, and the closest such assets are the *Deserted settlement 300m WNW of Lairhope Cottage*, beyond the Study Area to the north-west and the *Crom Rig earthwork*, a prehistoric enclosure beyond the Study Area to the north-east. Neither of these assets or their settings are considered to affect the routing of the proposed OHL.

R6.2.55 Listed buildings are protected under the Listed Buildings and Conservation Areas (Scotland) Act 1997. The purpose of listing is to ensure that any demolition, alteration, repair or extension that would affect the building's special architectural or historic interest is controlled. The term 'building' is defined broadly and can include, for example, walls and bridges. Protection also extends to the interior of listed buildings and to all buildings within the curtilage of the listed building that have formed part of the land since before 01 July 1948. Buildings of special architectural or historic interest are divided into three categories to reflect their degree of interest. However, all listed buildings receive equal legal protection.

R6.2.56 Only two listed buildings are located within the Study Area. No direct impacts are anticipated as a result of the proposed OHL route; however, they may experience change to their settings. The listed buildings comprise the following, which are each located adjacent to the A7 Road at Bowanhill in the north of the Study Area:

- Henderson's Knowe and Old Smithy (LB10793 - Category C designation); and
- Bowanhill Cottage (Johnnie Armstrong Gallery) at Henderson's Knowe and Old Smithy (LB10793 - Category C designation).

R6.2.57 Conservation areas are protected under the same legislation as listed buildings and are areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. There are no conservation areas located within the Study Area.

R6.2.58 There are no Gardens and Designed Landscapes (GDLs) within the Study Area, nor are any other key cultural heritage constraints such as Archaeologically Sensitive Areas, Non-inventory Gardens and Landscapes or identified undesignated features of national importance, which national planning policy requires should be protected.

R6.2.59 The Dumfries and Galloway Historic Environment Record and the Scottish Borders Historic Environment Record each records the locations of a number of known non-designated buildings and archaeological sites within the Study Area, none of which are of such significance to influence the potential routeing corridors of the proposed OHL. It is highly likely that other, as yet undetected, remains of archaeological interest are present within the Study Area. Further, more detailed, work on the known and non-designated cultural heritage assets will be undertaken to inform the EIA.

Transport and Access

R6.2.60 The Study Area is accessible at two existing locations with the trunk road network (A7): the A7/Teviothead priority access junction (to Carlenrig and Merrylaw); and the A7/Falnash priority access junction (to Falnash and Hislop). A new access location is considered feasible in principle from certain locations on the A7 and south of Teviothead, subject to agreement with Transport Scotland and more detailed evaluation of technical constraints and junction design standards.

Strategic Access

R6.2.61 The A7 connects Galashiels in the Scottish Borders with Hawick, the main town to the north of the route, with Longtown in Cumbria and, further south, the M6 on the northern periphery of Carlisle. Whilst detailed route investigations have not yet been undertaken, conventional road vehicles will be able to use the A7 without restriction, albeit routing strategies for longer and abnormal-load carrying vehicles will require testing if passage is required through smaller towns and hamlets as Hawick and Longtown.

Local Access

R6.2.62 The A7/Teviothead access junction provides direct access to Caerlan Rig to the south and west of Teviothead, albeit alignment constraints and sensitive receptors exist on the most northerly extents of this route, including: Teviotdale church and cemetery; residential properties; mature trees/tree canopy; and Teviotdale village hall. These are likely to pose access issues for abnormal and/or heavy loads. Whilst the existing alignment constraints and sensitive receptors should be avoided, the existing access route further south on the Caerlan Rig, straddled to the east by the Limiecleuch Valley and to the west by the Teviot Valley, is considered feasible subject to a further detailed technical analysis on gradients and loading requirements.

R6.2.63 Based on preliminary desk-based research and on-site observations, a new access location from the A7 may be feasible to the south of Teviothead. This would, however, require consideration of other technical constraints/considerations and require discussion and agreement with Transport Scotland (TS), given the presumption against new accesses onto the trunk road network.

R6.2.64 The existing Caerlan Rig access route is considered the most viable long-term access option for the proposed routes substation (location 080419).

R6.2.65 The A7/Falnash access junction has recently facilitated works undertaken by Scottish Power at the northerly extents of the Teviot Valley. This location, with an upgraded/reinforced bridge over the River Teviot, would pose a feasible option for OHL construction access for route corridor A and route corridor C. Should the currently indicative access routes proposed for the Faw Side Community Windfarm be delivered and constructed in advance of the OHL, and/or detailed designs and structural form confirmed in advance, this may pose a feasible access solution for the substation and part-access solution for the OHL itself.

R6.2.66 A site visit undertaken on 26 August 2019 indicated evidence of lay-down areas for materials to the south of the Falnash/Hislop access road and, further south, evidence of informal tracks/gated access (albeit this peters out southbound).

R6.2.67 Should it not prove possible to make use of the existing Caerlan Rig access route (ridge) between the Limiecleuch Valley and the Teviot Valley, the Teviot river valley (via the A7/Falnash access junction) or the proposed wind farm access road along the Limiecleuch Burn would be possible alternatives for the OHL based on site-observations. Where practicable, best use should be made of existing infrastructure and/or upgrade what is available to an acceptable standard to achieve access requirements.

Further Considerations

R6.2.68 Access for construction purposes to the new OHL will be temporary, largely follow the power line centre line where practicable and will take the form of a rough gravelled surface that can be removed post-construction, or matting, the latter being preferable in terms of reducing surface degradation (indeed, every effort will be made to preserve existing grass cover).

R6.2.69 Access routes need to be free of stumps, timber, holes and any unevenness which would restrict the progress of vehicles along the route during construction. Less evidence of this was found on the Teviot Valley side, compared to the Limiecleuch Hill (based on remote observations of tree coverage) during on-site observations.

R6.2.70 Through the Teviot Valley, there is limited opportunity to take short spurs from an existing track network (which would be an option using the Caerlan Rig route).

R6.2.71 Discussions will take place with Transport Scotland and Scottish Borders Council and baseline traffic speeds, flow and composition are likely to be required on the A7 and, potentially, both the Caerlan Rig and Falnash access routes. Gradients and soil conditions will need further assessment.

R6.2.72 An indication of the potential access options is presented on **Figure 13**. The corresponding photos for Figure 13 are provided below.

Image 6.9: Photo Point A – View of Falnash Burn Road from A7

Image 6.10: Photo Point B – Sensitive Receptors on Caerlan Rig

Image 6.11: Photo Point C1 – View Towards Limiecleuch

Image 6.12: Photo Point C2 – Southern View Along Caerlan Rig

Socio-economics and Tourism

Population and Settlements

R6.2.73 The Scottish Borders includes the eastern part of the Southern Uplands. The region is largely rural, with a population of 115,300 in 2018[4]. It is divided into five areas[5]. Of relevance here is the Teviot and Liddesdale area, within which 86% of the population lives in three settlements of Hawick, Newcastleton and Denholm[6]. The remaining population live in smaller settlements such as Teviothead, Minto and Bonchester Bridge or in isolated farmsteads and hamlets.

R6.2.74 Hawick is situated in the valley of the River Teviot and is the largest town in the Scottish Borders with a population of 13,889 in 2019[7]. It is located approximately. 13km north of the Study Area and outwith the Socio-economic Study Area including buffer zone.

R6.2.75 Whilst the region is not densely populated, the following residential clusters are proximate to the Proposed Development. They all fall within the administrative boundary of Hawick:

- Teviothead (small settlement and civil parish);

[4] ONS Population estimates – total population (2018)
[5] Berwickshire; Cheviot; Eildon; Teviot and Liddesdale; and Tweeddale.
[6] Scottish Borders Area Partnerships (2020). Available at: https://www.scotborders.gov.uk/info/20015/your_council/472/area_partnerships/5
[7] Scottish Borders Teviot & Liddesdale Locality Plan April 2019 Draft. Available at: https://scottishborders.moderngov.co.uk/documents/s35426/Item%20No.%204%20-%20Teviot%20Liddesdale%20Locality%20Plan%20-%20Draft%20002.pdf

- Newmill (Hamlet);
- Howpasley (hamlet);
- Craik (hamlet);
- Linhope (hamlet);
- Ewes (parish);
- Arkleton (hamlet); and
- and Kirkstile (hamlet).

R6.2.76 Much of the surrounding area is covered by sparsely inhabited forest and moorland, with a few isolated farmsteads. Due to the rural nature and low population of these farmsteads, they will not be considered within the socio-economic and tourism assessment.

R6.2.77 It is unlikely that the Proposed Development will have any direct impact on the resident clusters identified, with the exception of Teviothead where access is likely to be taken and where the OHL is likely to connect to the V-Route. Users of the A7, which connects Galashiels in the Scottish Borders with Hawick, may experience visual effects as a result of the Proposed Development (primarily around Teviothead where connection is likely to be made with V-Route).

Employment

R6.2.78 The economic activity rate is a useful measure of the labour market opportunities available in the Scottish Borders. The economic activity rate measures the percentage of the population (16-64yrs), both in employment and unemployed, that represent the labour supply regardless of their labour status.

R6.2.79 In 2018[8], economic activity for the Scottish Borders was 79.1%, above that for both Scotland (77.8%) and Great Britain (78.9%), Economically inactive persons in the region predominantly comprise those considered to be 'long-term sick' (29.3%).

R6.2.80 There were 1,000 workforce jobs across the Newcastleton and Teviot area in 2018[9]. The leading employment sectors were 'Manufacturing' at 30% (300 jobs) and 'Human health and social work activities' at 25% (250 jobs).

Tourism

R6.2.81 Tourism forms a key element of the Scottish Borders economy, with 463 registered tourism business units across the region. Tourism contributed £92.2 million Gross Value Added (GVA) to the Scottish Borders economy in 2017[10], supporting 4,000 jobs[11].

R6.2.82 In 2018, the most recent full year for which figures are available, UK residents made an estimated 391,000 day visits to the Scottish Borders, staying 1.2 million nights (an average length of stay being 3.1 nights), and spending £70 million.

[8] ONS annual population survey October 2018–September 2019
[9] S02001021 Newcastleton and Teviot area
[10] Visit Scotland. Insight department: Scottish borders factsheet (2018). Available at: https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/regional-factsheets/scottish-borders-factsheet-2018.pdf
[11] Regional Sustainable Tourism as defined by the Scottish Government.

Local Tourism Businesses

R6.2.83 A limited number of business located Socio-economic Study Area may experience visual effects as a result of the Proposed Development including:

- Visitor Accommodation:
  - Mosspaul Inn;
  - Phaup Cottage;
  - Colterscleuch House & Cottage;
  - Woodburn Cottage;
  - Hoscote Estate;
  - Teindside Lodge; and
  - Meadshaw Farm Bed and Breakfast.
- Recreational Activities in the Open Countryside:
  - Wolfcleuch Waterfall, Craik Forest, Hawick;
  - Pikethaw Hill;
  - Ellson Fell;
  - Wisp Hill; and
  - Cauldcleuch Head.
- Indoor Tourist Destination:
  - Johnnie Armstrong Gallery.
- Outdoor Tourist Destinations:
  - Craikhope Outdoor Centre.

R6.2.84 Visual effects are primarily anticipated to occur around Teviothead where a connection is likely to be made with V-Route.

Recreation

R6.2.85 There are no designated cycle routes, Core Paths or other Rights of Way within the initial Scoping Study Area. The Socio-economic Study Area does, however, contain a Core Path and a number of other Rights of Way which may be visually affected by the Proposed Development. This includes the following, as shown on **Figure 14**:

- Core Path:
  - Scottish Borders Core Path 196/Cowan Fell to Crail Crosshill.
- Right of Way:
  - B263;
  - BR70;
  - BR71;
  - BR77;
  - BR78;

- BR79;
- DA10; and
- Untitled Right of Way (east of Cauldcleauch Head).

- Permissive Custom Path (a route with a known history of public use[12])

R6.2.86 It is of note that the Borders Historic Route runs along the A7 within the Socio-economic Study Area. The route extends 89 miles from Edinburgh to the Scotland/England border near Gretna Green[13]. As with the A7, users may experience visual effects as a result of the Proposed Development (primarily around Teviothead where connection is likely to be made with V-Route). The portion of the Borders Historic Route close to the Proposed Development is not identified a significant tourist attraction, being part of a long distance route rather than a locally significant tourism asset. The route will therefore not be considered a receptor within the socio-economic assessment.

R6.2.87 It is acknowledged there are a number of listed buildings within the Socio-economic Study Area. Although one of these has a category B designation (Fiddleton Toll Bar Cottage - LB9770), the listed buildings are predominantly category C designations and therefore considered to be representative examples of a period, style or building type.

R6.2.88 The listed buildings are predominantly used for residential purposes. and are not are not considered to be tourism assets that require assessment under this heading. Listed buildings with the Study Area will however be considered as part of the cultural heritage assessment.

Land Use and Forestry

R6.2.89 The land within the Study Area predominantly comprises a mixture of flood plains with river terraces, incised slopes and former lake beds. The land is used for a mixture of forestry and upland grazing, with small individual houses, farms and other dispersed settlement forms being the most notable signs of human activity. These include hamlets and small settlements (Teviothead, Howpasley, Craik, Linhope, Ewes, Arkleton and Kirkstile) which collectively fall within the administrative boundaries of Hawick town. Watercourses are also present in the Study Area with the River Teviot, Hazelhope Burn and Limiecleuch Burn all rising to the southwest of Teviothead.

Agriculture

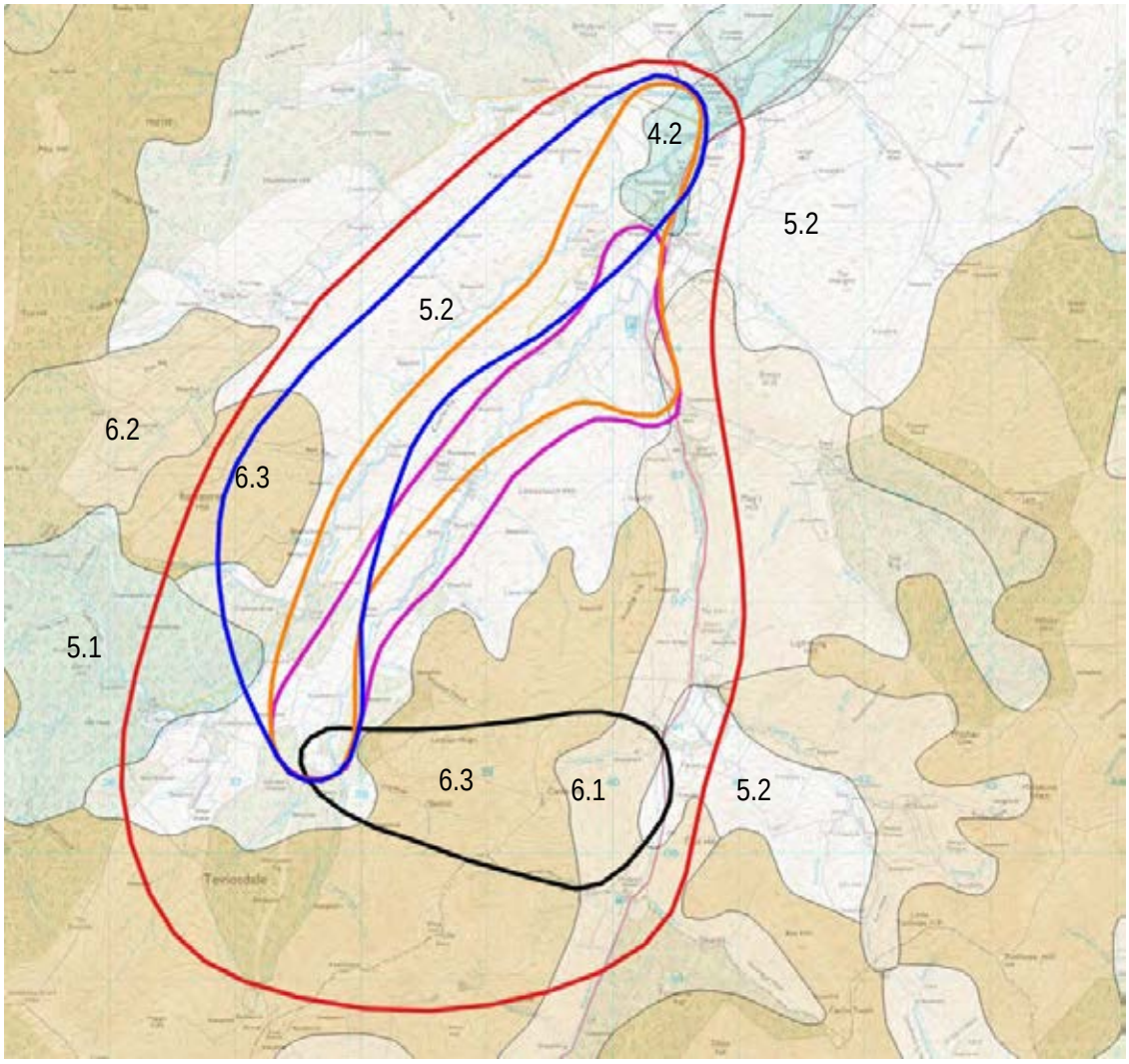
R6.2.90 Scotland has been mapped by the Macauley Institute in terms of its capability for agriculture, with different categories identified dependent on the prevailing soil, climate and relief. The classifications within the Study Area include the following (Figure 6.13):

- The area directly surrounding Teviothead, and then northwards, is Class 4.2, defined as "*Land capable of producing a narrow range of crops, primarily on grassland with short arable breaks of forage crops*";
- To the south of the encompassing Rams Cleuch, Hill Head and Merrylaw the land is Class 5.1 defined as "*Land capable of use as improved grassland. Few problems with pasture establishment and maintenance and potential high yields*."

[12] Scottish Borders Council: Scottish Borders Core Paths - Permissive/Customary paths. Available at: https://www.scotborders.gov.uk/directory/62/scottish_borders_core_paths
[13] Borders Historic Route. Available at: https://www.visitscotland.com/see-do/tours/driving-road-trips/routes/planner/borders-historic-route/

- The majority of the landscape is Class 5.2, defined as being "*Land capable of use as improved grassland. Few problems with pasture establishment but may be difficult to maintain.*";
- To the south towards Lang Burn, there is a small area of Class 6.2 defined as "*Land capable of use as rough grazings with moderate quality plants*";
- The remaining area of land within the Study Area encompassing Comb Hill, Rowantree Hill and Commonbrae Hill, is Class 6.3 defined as "*Land capable of use as rough grazing with low quality plants*";

Image 6.13: Agricultural Capability



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Blue: Route Corridor A *Orange: Route Corridor C*
Purple: Route Corridor B *Black: Route Corridor D*

R6.2.91 The overall quality of the agricultural land is therefore low, with no land identified as Prime Agricultural Land (Classes 1, 2 and 3.1) which would be afforded protection from development in Scottish Planning Policy (SPP). Agriculture, as a land use, has therefore not informed the route appraisal.

Forestry

R6.2.92 Forest and woodland within the Study Area have been identified through use of aerial photography, a site visit and by walking the route options along, with a review of publicly available data from SNH and Scottish Forestry. Forestry is generally divided into three main groupings:

- Conifer Forest:
  - Coniferous woodland;
  - Coniferous plantations; and
  - Coppice and early-stage plantations.
- Ancient and semi-natural woodland sites; and
- Native Woodlands:
  - Broadleaved deciduous woodland; and
  - Native woodlands.

R6.2.93 Forest and woodlands are characteristic components of the landscape particularly to the north and west of the Study Area, at Craik Forest. It is of note that a number of the coniferous plantations have been felled and will be managed on a 30-50 year clearfelling and restocking cycle. There are no ancient and semi-natural woodland sites within the Study Area.

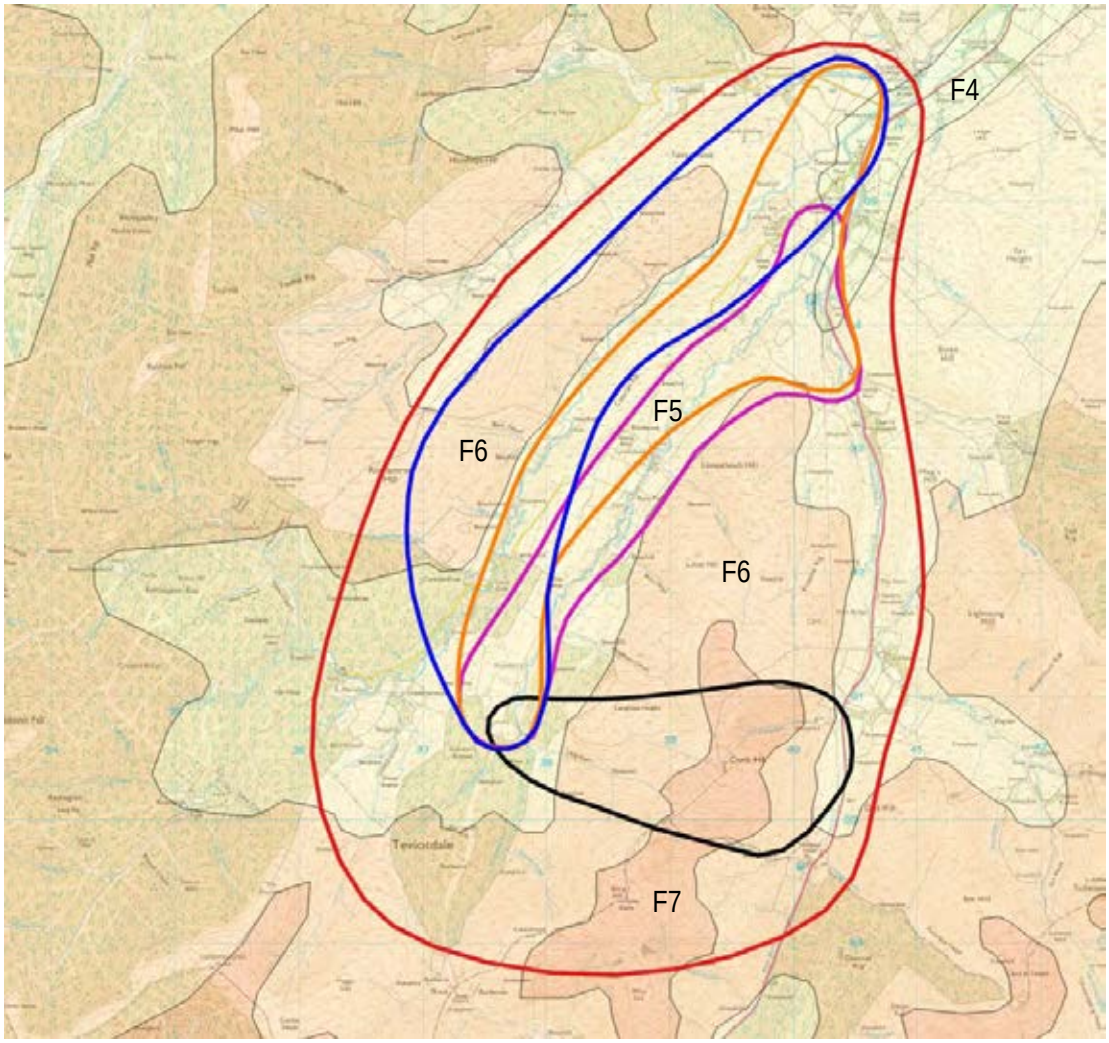
R6.2.94 The northern portion of the Study Area contains an area of native woodland. This area is unlikely to be affected by the Proposed Development as the approved access track for the wind farm, to the north, will not cross into the woodland boundary.

R6.2.95 The national land capability for forestry provides information on the potential for land to grow trees based on several factors including soil, climate and topography (Figure 6.9). Under these classifications:

- Teviothead is Class F4, defined as "*Land with moderate flexibility for the growth and management of tree crops*";
- Most of the Study Area is Class F5 defined as "*Land with limited flexibility for the growth and management of tree crops*";
- Areas extending to Limiecleuch Hill and Tanlaw Naze are Class F6 defined as *"Land with very limited flexibility for the growth and management of tree crops"; and*
- Elevated land on Comb Hill and Limie Hill are F7 *"Land unsuitable for producing tree crops"*

R6.2.96 Forestry plantations within the Study Area are generally on the F5 land with some limited incursion to the F6 areas. As shown in **Figure 6.14**.

Image 6.14: Forestry Capability



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Blue: Route Corridor A *Orange: Route Corridor C*
Purple: Route Corridor B *Black: Route Corridor D*

R6.2.97 Whilst the land is therefore capable of growing tree crops, the route options considered are largely devoid of tree cover other than some limited planting in the area immediately around the Faw Side Wind Farm substation and in the initial sections of route corridors A and B in the vicinity of Commonbrae.

Other Land Use

R6.2.98 Within the Study Area, other forms of land use have been considered by reference to the LDP. The Study Area, being devoid of upper tier settlements, does not contain any land use designations and as such the provisions of Policies PMD 4 Development outwith development boundaries, ED9 Renewable energy Development, and ED10 Protection of prime quality agricultural land and carbon rich soils, will dictate the acceptability of the proposals in a land use planning context.

Ground Conditions

Geology

R6.2.99 The British Geological Society (BGS) GeoIndex Onshore interactive map[14] and Geological Survey of Scotland 1:50,000 geological map series (Hawick sheet 17W[15]) were reviewed for the published information on geology in the Study Area. **Figures 15** to **17** support this section.

R6.2.100 The Study Area is shown to be chiefly underlain by Devensian Glacial Till Diamicton, generally described as till, comprising boulders and stones in a hard to stiff, sandy, silty clay matrix. Superficial deposits along the courses of the River Teviot and Limiecleuch Burn and an area to the west of Teviothead are shown to by underlain by alluvial deposits. These generally comprise silt, sand and gravel. Peat deposits (hill, basin or valley peat), are shown to be present in places across the Study Area as illustrated on **Figure 15**.

R6.2.101 The entire Study Area is shown to be underlain by rocks belonging to the Hawick Group. These rocks comprise of thin to medium bedded greywacke and interbedded, silty mudstone with thin, red mudstone beds in Carghidown Formation and laminated, fossiliferous, carbonaceous, siltstone beds in Ross Formation. Greywackes are calcareous except in the Cairnharrow Formation. Dykes or isolated, unnamed, igneous intrusions are present on the Blackcleuch Rig ridge, which forms the north-western section of the Study Area. A dyke feature is also present to the east of Teviothead. There are no publicly available exploratory borehole logs available.

R6.2.102 Ordovician to Carboniferous bedrock at or near the surface is shown generally along the highest sections of the valley sides and tops of the surrounding hills.

Ground Stability

R6.2.103 The key potential ground stability hazards have been summarised below.

R6.2.104 There is potential for landslide ground stability hazards within the Study Area particularly along the steeper sections of the Limiecleuch Burn and River Teviot valley sides. From review of Google Earth's online imagery dated 10 August 2009, there is geomorphological and visual evidence of landslips and debris channels. These are primarily on slopes oriented to the south east along the Blackcleuch Rig ridge but also, in a more offsite capacity, on the north western oriented slopes of Limie Hill.

R6.2.105 These landslip features are characterised by areas of contrasting greener vegetation and aspects such as scarps, particularly along the Blackcleuch Rig ridge. Collectively, these landslip areas are generally anticipated to be associated with surface water channels and/or springs. Superficial debris slides, notably peat landslips, may also be a hazard feature of this upland area, particularly on steeper slopes.

R6.2.106 A shallow slope instability hazard may also exist where livestock over-grassing and slope erosion has taken place. The upland area is shown to have many sheepfolds/pens throughout.

R6.2.107 The potential for compressible ground stability hazards may exist locally in areas of peat and alluvial deposits.

[14] BGS (2019) GeoIndex Onshore, available at: https://www.bgs.ac.uk/geoindex/, accessed on 09/01/2020
[15] BGS (2019) Geological Survey of Scotland, 1:63,360/1:50,000 geological map series, available at: https://www.bgs.ac.uk/data/maps/maps.cfc?method=viewRecord&mapId=10714 and http://www.largeimages.bgs.ac.uk/iip/mapsportal.html?id=1002324, accessed on 09/01/2020

R6.2.108 With reference to the Stantec Natural and Artificial Cavities Databasem there are no man-made mining cavity records. A review of the BGS non-coal mining plans[16] shows no entries for the Study Area or immediate surrounding area.

R6.2.109 The Coal Authority Interactive Mapping tool[17] indicates that the Study Area does not lie within a Coal Mining Reporting Area.

Hydrology and Hydrogeology

River Teviot

R6.2.110 The River Teviot rises to the south-west of Teviothead in the forests surrounding Ewesdown Fell and Black Burn Head and the catchment area of the watercourse at Teviothead is 23.2km^2, (see **Figure 18**).

R6.2.111 As the River Teviot runs north-east through route corridor A, it flows with a reasonably gentle gradient in a sinuous manner, meandering along a valley floor approximately 100-150m wide; however, the width of the valley floor varies along its length. During the walkover on 26th August 2019, it was observed that the river is dynamic within the floodplain corridor, with evidence of the river shifting its route over time through erosion and deposition. This is a common feature of such watercourses.

R6.2.112 Due to the meandering nature of the river, the width of the flat valley floor is considered to be the functional floodplain, which flood waters would route into during storm events.

R6.2.113 Above the flat valley floor, the banks rise more sharply on both sides, with a raised river terrace on the northern slopes. This rises more gradually than the southern slopes before ramping up to the top of Blackcleugh Rig.

Limiecleuch Burn

R6.2.114 The Limiecleuch Burn flows parallel to the River Teviot in the valley immediately to the south. The burn rises in the hills to the east of the head of the River Teviot, and the catchment area at Teviothead is approximately 10.4km^2.

R6.2.115 The nature of the watercourse, as it flows through the valley, is similar to that of the River Teviot with a meandering channel flowing along a flat valley floor. The valley is generally narrower than the Teviot, and there are fewer areas of raised river terrace as noted above.

R6.2.116 The upstream reach of the Limiecleuch Burn, immediately downstream of the location of the substation, is heavily vegetated on both banks and is particularly narrow with a width of approximately 40-50m. This opens to a width of approximately 100m further downstream; however, the width varies and narrows as it runs below the area of ancient woodland in the valley.

R6.2.117 As with the River Teviot, the flat floor through the Limiecleuch valley is considered to be the functional floodplain, with a dynamic shifting channel meandering through it.

[16] BGS non-coal mining plans, available at http://mapapps2.bgs.ac.uk/mineplans/home.html, accessed on 09 January 2020
[17] Coal Authority Interactive Mapping tool, available at http://mapapps2.bgs.ac.uk/coalauthority/home.html, accessed on 09 January 2020

Hydrological Constraints by Route Corridor

Route Corridor A

R6.2.118 Route corridor A provides a greater space for the location of the OHL, where the proposed towers could potentially be located on the raised river terraces. This would avoid trying to locate towers on the steeper ground higher up the valley sides.

R6.2.119 At the downstream end of the valley the sides narrow, with the raised river terrace not continuing the full length.

R6.2.120 This may present a significant constraint as the valley floor should be avoided. Location of towers within the functional floodplain should be avoided to prevent changes to the hydrodynamics of the floodplain which may result in increased erosion, changes in flooding patterns which could impact further downstream, and also to prevent pollution during construction and operation of the proposed route. Additionally, access to the towers for construction and maintenance may be hindered by flooding if the infrastructure was to be located there.

R6.2.121 The number of potential river crossings along the Teviot Valley route would also be minimised with ideally only two – one at the upstream end, and one at the downstream end at the connection location.

Route Corridor B

R6.2.122 Route corridor B along the Limiecleuch Burn is more constrained to the narrow valley with steeper sides. As above, construction of towers within the functional floodplain should be avoided; however, with steeper valley sides, there is little room to route the OHL without constructing into the steep hillside.

R6.2.123 At the downstream end of the valley, it is also noted that the location of the connection to the existing pylons is within the functional floodplain. Where possible, any new infrastructure should be avoided in this location, however this may not be possible due to operational reasons. Where this is the case, any access tracks should be constructed at the existing ground levels to avoid impacting upon flood flows or floodplain storage.

Route Corridor C

R6.2.124 Route corridor C along the ridge line between the Limiecleuch valley and Teviot valley does not have the same hydrological constraints due to the elevation and distance from the watercourses.

R6.2.125 It should be noted, however, that at the downstream end of the route, where the connection to the existing pylons is to be made, the same constraints as noted above would be relevant and any new infrastructure within the functional floodplain should be avoided where practicable.

R6.2.126 Construction of the OHL and associated access tracks will require a Controlled Activities Regulations (CAR) Licence to deal with the surface water runoff from construction activities. This will involve the design and implementation of sustainable drainage systems (SuDS), or other pollution mitigation measures that may be deemed acceptable by SEPA, to capture and treat the runoff and the development of a Pollution Prevention Plan.

R6.2.127 Any watercourse crossings will require to be designed to convey the 1 in 200 year flows so as not to increase flood risk up or downstream of the crossings.

Noise and Vibration

R6.2.128 The Proposed Development is not considered to be noise sensitive. Any impacts from existing noise and vibration sources on the Proposed Development can therefore be considered to be negligible and not significant.

R6.2.129 Noise and vibration effects due to construction phase works will be of a temporary nature. The impact from the construction phase can also be managed by appropriate mitigation measures such as screening and hoarding, limited working hours and specific work methods. These measures will be set out in the Construction Environmental Management Plan (CEMP). With effective mitigation through the CEMP, the impact from construction on existing noise sensitive receptors is not considered to be significant.

R6.2.130 The effect of operational noise associated with the Proposed Development on existing noise-sensitive receptors is not expected to be significant as the proposed 132kV OHL is not considered a significant source of noise. Operational noise impacts are therefore considered to be negligible and not significant.

Human Health

R6.2.131 The Proposed Development is not anticipated to have a direct impact on human health and amenity, as a result of the low population of the Study Area (comprised of small parishes, hamlets and a small village) and the nature of the scheme.

R6.2.132 In accordance with Regulation 4(2) of the 2017 Town and Country Planning EIA Regulations, however, the environmental interactions chapter of the EIA will consider any likely significant effect on human health and amenity, arising from any potential interactions between likely significant effect arising on the individual 'factors' listed in Regulation 4(3) – (a) population and human health; (b) biodiversity; (c) land, soil, water, air and climate; and (d) material assets, cultural heritage and the landscape.

Climate

R6.2.133 It is acknowledged that the construction phase of the Proposed Development will utilise energy intensive materials (e.g. metals) as well as fossil fuels for construction/plant vehicles. Once complete, however, the Proposed Development will support the UK's transition towards a low carbon economy by enabling the displacement of electricity generated from coal fired capacity, grid mix or a fossil fuel mix.

R6.2.134 The scheme itself is not considered to have a direct impact on climatic factors. However, the placement of the Proposed Development's associated infrastructure on the landscape and wider environment may result in the infrastructure being vulnerable to future climatic factors. Given the meandering nature of the River Teviot within the Study Area and the width of the flat valley floor, this area is considered to be the functional floodplain in which flood waters would route into during storm events. The Proposed Development's infrastructure may therefore be vulnerable to future climatic flood risk events. However, this will be considered within a Flood Risk Assessment (FRA), as well as in the Hydrology and Hydrogeology chapters of the environmental appraisal. In accordance with planning policy, suitable mitigation will be incorporated into the design of the Proposed Development to ensure that there is not a significant risk of flooding, even when allowing for the impact of climate change.

R6.2.135 In accordance with Regulation 4(2) of the 2017 Town and Country Planning EIA Regulations, each discipline discussed within the EIA Report will give consideration to climate factors.

R6.2.136 The Proposed Development is not considered to have any likely significant effects on the climate or be significantly affected by climate change.

R7. Stage 3: Appraisal of Route Corridors and Route Options

R7.1.1 Having defined the range of route options within which the connection could be located, it is necessary to appraise these corridors against the environmental baseline and technical constraints identified. Whilst the route corridors have endeavoured to avoid the mapped strategic constraints, there will inevitably be some conflict with these, and it is part of this stage to identify to what extent this is the case, and to identify on this basis the relative 'best fit' route.

R7.1.2 The appraisal stage therefore reviews the main issues identified in the baseline stage, considering the following:

- Potential route corridor length;
- Biodiversity and environmental designations;
- Landscape and visual including:
  - Landscape quality;
  - Visual amenity; and
  - Residential amenity.
- Cultural heritage;
- Socio-economics, recreation and tourism;
- Land use;
- Flood risk and hydrology;
- Geology and ground conditions; and
- Other issues (traffic and transport, noise, human health, etc.).

R7.1.3 Throughout the appraisal process, those parts of the Holford Rules which are applicable to the different appraisal principles are encompassed within the general review.

Potential Route Corridor Length

R7.1.4 Within the context of the distribution of environmental and technical constraints, it is desirable to keep the length of the OHL as short as practicable. This concurs with Holford Rule 3, which states that *"Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers."* A shorter route corridor will therefore score better than a longer route when being appraised as part of a comparative exercise.

Landscape Quality

R7.1.5 This principle draws on information contained within documented landscape character assessments and landscape designations (at all levels) with this supplemented by site work focussed on the individual route corridors. To understand the landscape and visual constraints that exist across the potential corridors, a review of the routeing corridors has been undertaken that looks at the key landscape and visual issues as defined within the current guidance on this topic and recognised landscape character and visual amenity assessment processes.

R7.1.6 The review will include reference to traditional landscape character assessment processes and will refer to the sensitivity gradient proposed to be used within the LVIA for the proposal, which are tabulated as follows:

Table 7.1: Landscape Receptor Sensitivity Criteria

Category	Landscape Receptor Sensitivity Criteria
Very High	• Nationally designated/valued countryside and landscape features or areas. • An absence of landscape detractors whereby there exists a largely undeveloped landscape; particularly relevant where no existing OHLs are present. • Areas where landform is such that OHLs would be visible or prominent in the landscape or would dominate skylines i.e. exposed areas with wide intervisibility. • Smaller, more intimate scale landscapes where change would be more evident and landscape features are found in greater number and/or are of greater quality. • A wide distribution of characteristic landscape features which are sensitive to loss individually or collectively.
	• Undesignated countryside and landscape features or areas. • Presence of many landscape detractors that already rode the landscape character; particularly relevant where existing OHLs are present, but where there is no risk of the creation of a wirescape. • Areas where landform is such that OHLs would have limited intervisibility and would be able to be assimilated into the landscape context without forming prominent or dominant elements i.e. valley landscapes. • Larger scale landscapes where change would be less evident and where structures of large linear scale would be more acceptable. • Landscapes where features are found in lesser number and/or are of lesser quality. • A limited distribution of characteristic landscape features which are less sensitive to loss individually or collectively.
Very Low	

R7.1.7 Whilst the level of designation and documented protection form a key component of the definition of sensitivity, it is also relevant to consider the particular attributes of OHLs to which a landscape may or may not be sensitive – this as detailed above refers to their susceptibility. For OHLs, this includes their linear nature, and ability to affect a potentially wider area; their visual prominence resulting from their height relative to other landscape or built features; or the fact that they are man-made structures within what might be a largely exposed or undeveloped landscape situation. This approach not only reflects the Holford Rules but also the new Landscape Institute guidance that advocates the adoption of sensitivity criteria based upon both inherent landscape value and also the susceptibility of a receptor to the type of change (development) proposed.

R7.1.8 In utilising a comparative sensitivity for the landscapes subject to routeing as defined above, the review will address the hierarchical approach proposed by the Holford Rules 1 and 2, whereby areas of highest amenity value should be avoided. It further reflects Rules 4 and 5, which discuss the routeing of OHLs relative to ridges, skylines and general topography.

Visual Amenity

R7.1.9 This principle looks at the potential visibility of the OHL from rights of way, highways, local areas of tourist activity or areas of settlement, and considers the change in view that might result from the proposed OHL and how this could affect the general amenity within the Study Area. This review accords with the 'Further Notes' to the Holford Rules, which states that routes should *"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."*

R7.1.10 When considering potential changes to views, 'perceptibility studies' undertaken as part of the Blackcraig and Margree grid connection (jointly by the author of this Routeing Consultation Document) established that the nature of views, i.e. whether the elements were 'backclothed' or 'skylined', has a considerable impact on the extent of change experienced, and at what distance.

The conclusions drawn for a similar type of infrastructure (single-circuit flat formation wood pole line) were as follows:

- 1.5km is the outer limit of 'normal' perceptibility (the distance beyond which the casual observer is likely to be unaware of the presence of an OHL of this type) when the OHL and support structures are fully backclothed;
- 2.5km is the absolute limit of perceptibility when the OHL and support structures are fully backclothed; and
- 6km is the outer limit of visibility when the OHL and support structures are seen fully skylined.

R7.1.11 These distances provide a basis to understand the likely 'perceptibility' of the route. In many cases, although the OHL and support structures are theoretically visible (on the basis of the bareground digital terrain), the perceptibility of these will be appreciably diminished. The visual review undertaken subsequently has been carried out on the basis of assumed visibility; the moderating effects of 'perceptibility' will also be considered. These, in addition to the screening provided by the extensive areas of commercial forest and other woodland, will often serve to appreciably mitigate the presence of an OHL of the size proposed within the landscape.

R7.1.12 As with any material subjected to the elements on a consistent basis, wood pole structures suffer weathering and subsequent colour variations over time. The colour of the poles at the point of construction is a dark brown colour, which fades over time to a more silver-grey, and appreciably lighter, colour. The rate of change of colour will depend heavily on the prevailing weather conditions and to some degree on the type of timber and timber treatment that is used. The perceptibility distances outlined above are considered representative at the point of construction when the poles retain the darker brown colouration.

R7.1.13 Over time, as the poles age and fade in colour, the effectiveness of backclothing is likely to reduce (depending upon the colour of the prevailing backclothing landscape or landscape feature). This is to some measure compensated by a reduction in visibility of skylining when the poles have acquired a paler colour. On balance, it is considered that the wood pole component of the OHL will gradually become more perceptible over the life of the line, although this change in perceptibility is difficult to predict and is subject to variation depending on lighting, backclothing/skylining and many other factors.

Residential Amenity

R7.1.14 SPEN take a precautionary approach to the potential effects upon private residences and in line with the Holford Rules adopt an offset to these which avoids "*routeing close to residential areas as far as possible on grounds of general amenity*", and that in rural areas they *"avoid as far as possible dominating isolated houses, farms or other small-scale settlements".* SPEN adopt a 'trigger for consideration zone' to all private residences, and where possible route as far from individual or groups of properties as possible. These offsets are shown on **Figure 3**.

R7.1.15 The comparative exercise will look at the total number of private residences within the route corridor being appraised. Those corridors with fewer properties will score higher.

Other Environmental Designations

R7.1.16 The range of other key environmental designations will be reviewed for each corridor in terms of the level of conflict with them. Whilst every effort has been made to avoid these key constraints in the selection of route corridors, it is inevitable that on occasion there will be some conflict. The level of conflict, and the level of designation, will form the basis of the appraisal carried out and will determine the acceptability of such conflict.

Land Use and Forestry

R7.1.17 The Holford Rules are specific in stating that OHLs should route alongside areas of woodland/forestry, and that *'Where possible* [routes should] *follow open space and run alongside, not through woodland or commercial forestry, and consider opportunities for skirting edges of copses and woods'*. The Forestry Commission guidelines on routeing through woodlands provides the following guidance where such a route is unavoidable:

- Avoid areas of landscape sensitivity;
- Avoid the line of sight of important views;
- 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 alignment diagonal to the contour as far as possible; and
- Be inflected upwards in hollows and downwards on ridges.

Technical Considerations and Buildability

R7.1.18 The route corridors will be appraised against the technical constraints for the Trident Line design (including a single steel tower where the grid connection joins V-Route), which includes the following aspects:

- Extent of route corridor above 300m aOD (350m in extreme circumstances);
- Extent of route corridor with slopes equal to, or greater than, 15 degrees (22 degrees in extreme circumstances);
- Number of road and watercourse crossings; and
- Proximity and integration with existing and proposed infrastructure.

Route Corridor Appraisal

R7.1.19 With reference to the route corridors illustrated on **Figure 5**, **Table 7.2** below provides an appraisal of the corridors against the appraisal principles defined above. For each corridor a discussion is provided for each of the principles, and following this broad appraisal, a preferred corridor will be identified.

Table 7.2: Route Corridor Appraisal

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
Length of Route	**The length of the route between the substation and the connection point on the V-Route, as measured along the centre of the corridor.**	6.25km	4.3km to 4.9km	4.8km to 6.1km	2.71km	Route Corridor D is the shortest but is largely discounted. The next preferred is Route Corridor B or C.
Biodiversity	**River Tweed SAC/SSSI**	Route A follows the River Teviot valley, and therefore has the potential to create impacts upon the SAC/SSSI where the route crosses the river, or where groundworks are required in close proximity or within the floodplain of the river. Construction within or immediately adjacent to the SAC/SSSI has the potential to create temporary and permanent effects on the qualifying features through disturbance of protected species, particularly otter, and degradation of habitats (including that which the SAC is designated for). There is the potential for excavation, vehicular access or sedimentation due to rain during construction works resulting in silting or disturbance of gravel beds, which has the potential to adversely affect breeding and migrating salmon, eels and lamprey. Construction of embankments to support pylons may affect river flow.	Route B follows the Limiecleuch Burn valley, and therefore has the potential to create impacts upon the SAC/SSSI where the route crosses the burn, or where groundworks are required in close proximity or within the floodplain of the burn. Construction within or immediately adjacent to the SAC/SSSI has the potential to create temporary and permanent effects on the qualifying features through disturbance of protected species, particularly otter, and degradation of habitats (including that which the SAC is designated for). There is the potential for silting of gravel beds to affect breeding salmon and lamprey by excavation, vehicular access or sedimentation due to rain during construction works. Construction of embankments to support pylons may affect river flow.	Route C follows the ridge between the two waterways and therefore has the potential to avoid direct impacts upon the SAC/SSSI by avoiding crossings. There is the potential for disturbance effects on qualifying features at the route's southern extent, where the SAC/SSSI passes within close proximity to the substation.	Route D crosses the Limiecleuch Burn just east of the substation and therefore has the potential to create impacts upon the SAC/SSSI where the route crosses the burn, or where groundworks are required in close proximity or within the floodplain of the burn. Construction within or immediately adjacent to the SAC/SSSI has the potential to create temporary and permanent effects on the qualifying features through disturbance of protected species, particularly otter, and degradation of habitats (including that which the SAC is designated for). There is the potential for silting of gravel beds to affect breeding salmon and lamprey by excavation, vehicular access or sedimentation due to rain during construction works. Construction of embankments to support pylons may affect river flow.	Due to the reduced chance of adverse impacts, Route Corridor C is the preferred option.
	Protected and Notable Species (Ornithology)	The route passes through a block of coniferous woodland at its southern end. An anecdotal record of breeding goshawk was given for this location and spotted flycatcher were recorded there during the site walkover. There is potential for foraging raptors at all times. The river is not considered to be suitable to support regular occurrences of wildfowl, but it is possible that they could move along the valley, particularly during passage. However, it is likely that being set within a valley would reduce the likelihood of collision by waterfowl, which would generally be flying at a higher altitude.	There is potential for foraging raptors. The burn is not considered to be suitable to support regular occurrences of wildfowl, but it is possible that they could move along the valley, particularly during passage. However, it is likely that being set within a valley would reduce the likelihood of collision by waterfowl, which would generally be flying at a higher altitude.	The route passes through a block of coniferous woodland at its southern end. An anecdotal record of breeding goshawk was given for this location and spotted flycatcher were recorded there during the site walkover. There is potential for raptors and wildfowl passing through. Being set along a ridge between two valleys, there is a higher risk of collision from birds passing across the landscape. However, the presence of an existing telegraph line and residential properties to the north may discourage use of this area, particularly by species sensitive to human disturbance.	The remoteness of the route and the presence of heather moorland at higher altitudes increases the risk of certain species being present more frequently, including merlin, hen harrier and grouse species. The route also passes through a large area of coniferous woodland, which may be used by breeding goshawk.	Route Corridor B is the preferred option, although there is no strong preference due to the fact that all routes have some risk of impacts, which will be unknown until detailed survey work has been carried out.
	Protected Species and Notable species (Ecology)	Based upon the results of the desk study, the main terrestrial protected species constraints appear to be otter, reptiles and red squirrel. There is also potential for badger and pine marten to be present given the habitats along the route. The route passes through coniferous woodland, therefore necessitating a direct loss of habitat for red squirrel and possibly pine marten, and across a river channel, therefore likely causing disturbance of otter, albeit temporarily. Rough grassland is present along the entire route, meaning that reptiles are likely present, although	The route crosses a burn, and therefore has the potential to cause adverse impacts on both otter and fish species, including disturbance of otters, changes in flow and damage to the riverbed and floodplain from works/vehicular encroachment. Rough grassland is present along the entire route, meaning that reptiles are likely present, although impacts would be temporary and minor. A small area of ancient woodland is present in the north of the route, and the route passes by some conifer plantation. There is, therefore, the possibility	The route passes along a grazed ridge with existing infrastructure (paved road, telegraph line). There is a small risk of temporary impacts on reptiles. The route also passes through a block of coniferous woodland and through/alongside a small block of deciduous woodland. There is the potential to cause impacts upon red squirrel due to loss of habitat and disturbance. A small area of ancient woodland is present in the north of the route, and the route passes by some conifer plantation. There is, therefore, the possibility of	The route passes through coniferous woodland, therefore necessitating a direct loss of habitat and a risk of disturbance for red squirrel, and across a river channel, therefore likely causing disturbance of otter, albeit temporarily. The route crosses extensive rough pasture and heather moorland and is therefore very likely to cause adverse impacts upon reptiles.	There is no strong preference, although Route Corridor C is likely to cause less significant impacts.

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
		impacts would be temporary and minor. There is also a risk to certain fish species from disturbance/damage to the riverbed and changes in flow from works/vehicular encroachment within the floodplain/-channel, including lamprey and salmon, as noted above.	of disturbance to woodland species, such as red squirrel, badger and pine marten.	disturbance to woodland species, such as red squirrel, badger and pine marten.		
	Priority Habitats (Bog, Unimproved Acid Grassland, Lowland Mixed Deciduous Woodland)	Unimproved acid grassland exists along the length of the route, and the route passes over the River Teviot. The extent of bog habitat is unknown along the route, although it is unlikely to be prevalent given the topography, and if present is likely to be modified.	Unimproved acid grassland exists along the length of the route, and the route passes over the Limiecleuch Burn. The extent of bog habitat is unknown along the route, although it is unlikely to be prevalent given the topography, and if present is likely to be modified. A small area of ancient woodland is present at the northern end of the route, although it should be possible to avoid direct impacts through sensitive micro-routeing.	The route follows the ridge, which during the walkover appeared to support grassland of lower ecological value. A small area of ancient woodland is present at the northern end of the route, although it should be possible to avoid direct impacts through sensitive micro-routeing.	Unimproved acid grassland exists along the length of the route, and the route passes over the Limiecleuch Burn. The extent of bog habitat is unknown along the route but is likely to be present on Limie Hill.	Provided the route can be micro-sited to avoid impacts upon the small area of ancient woodland, route C is likely to cause the fewest impacts on sensitive habitats, due to its avoidance of either watercourse and the prevalence of lower value grassland.
Landscape and Visual	**Residential Amenity**	At the southern end of the corridor, it passes within 100m of a number of residences, particularly those at Commonbrae and Blackcleuch at the southern end of the route. There are also a number of false records in terms of residential amenity, such as the sheep shelters erroneously identified as residential dwellings. The property at Blackcleuch has an easterly aspect, and an open view across the burn. The dwellings at Commonbrae are set within a more enclosed setting, and both sets of dwellings have longer range views obscured by surrounding topography. Further north, the route passes within 100m of the properties which extend southwards from the main Teviothead conurbation, and also the main conurbation itself. The anomaly at Watch Knowe is not a residential dwelling, although those at Falnash are. Those dwellings on the road which runs south from the A7 are generally set within well vegetated settings, with little opportunity for open views across the River Teviot valley. The same is true for those dwellings near the A7, none of which appear to be specifically sited to take advantage of medium to long distance views. All dwellings within the corridor will have the possibility for some views across a route which runs through this area, although it is considered possible that routeing could avoid key views or views which would unacceptably impact residential amenity.	In passing to the east of the dwellings at Commonbrae and Blackcleuch, this corridor does not pass within 100m of residential dwelling until the farmstead at Lymiecleuch is reached. The first anomaly should be disregarded as it is a sheepfold and not a dwelling. Lymiecleuch is an active farmstead, and with a lack of surrounding vegetation, views are available up and down the valley, and also up the adjacent slopes. In being within the active floodplain, it is unlikely the OHL would pass in close proximity to the dwelling house, but as a visual receptor, it needs consideration in detailed routeing. Further north, the route only passes within 100m of a small number of dwellings and these are generally on the periphery of the corridor. The anomaly adjacent to the picnic sign is not a dwelling and therefore not a constraint. Those dwellings in and around Teviothead will require detailed consideration when looking at the connection point onto the V-Route. Some of these properties appear to have views across the existing V-Route and therefore also the potential connection point.	In comparison to corridors A and B, this corridor routes between the properties at Commonbrae and Blackcleuch and the Limiecleuch Burn, with these dwellings being on the very edge of the corridor area. Commonbrae is unlikely to comprise a constraint in this area due to its relative enclosure, but Blackcleuch is orientated towards the corridor in facing broadly east. Moving north, the next dwelling within proximity to the corridor is Lymiecleuch Farm, which is right on the periphery of the corridor. With a lack of surrounding vegetation it is likely that views of an OHL in this corridor would be available, so it would require consideration in the detailed routeing stage. At the northern end of the route almost all of the dwellings in the main part, and southern parts, of Teviothead are within 100m of this corridor. The corridor at the northern end extends east and west to accommodate a wide range of connection options so it is likely an acceptable route in amenity terms could be accommodated with sensitive detailed routeing.	The only dwelling within 100m of this corridor lies to the east of the A7 and is right on the periphery of the corridor. This dwelling (Braehead Cottage) has a view orientated towards the existing V-Route and route corridor (facing west) and therefore would be a key consideration in the detailed routeing process.	Due to the lack of dwellings in proximity Route Corridor D would be the preferred option. However, this is largely discounted for other technical reasons, such as gradient and elevation. Between Route Corridors A-C, there is no strong preference, with all corridors having to address the conglomeration of dwellings at Teviothead.
	Landscape Character	Route corridor A passes through all of the LCTs appraised in detail, with the large majority of the route crossing LCT 93, which is of lower susceptibility. This is unsurprising given the large proportion of	Corridor B follows the line of the Limiecleuch Burn and within one of the distinct valleys which forms part of LCT 93 within the Study Area. In doing so, there is a greater sense of enclosure, which increases susceptibility locally.	Route corridor A passes through all of the LCTs appraised in detail, with the large majority of the route crossing LCT 93, which is of lower susceptibility. This is unsurprising given the large proportion of the Study Area comprised of this LCT.	Corridor D passes only through LCT 93, and across the most exposed and remote parts of it. The presence of a telecommunications mast does provide some human context, however this is on the summit of Comb Hill	Given the extensive-ness of LCT 93 within the Study Area, there is no strong preference of Route Corridors A-C.

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
		the Study Area comprised of this LCT. The route follows the line of the River Teviot and within one of the distinct valleys which forms part of LCT 93 within the Study Area. In doing so, there is a greater sense of enclosure, which increases susceptibility locally. Care will need to be exercised at the extreme northern end of the corridor where the route passes into the higher susceptibility LCT 117, although the V-Route here provides context and precedent for OHL development of a larger scale. Similarly, at the extreme south-western end of the corridor, the more enclosed and transitional landscape between LCTs 93 and 96 will require detailed consideration.	At the northern end, the corridor includes a larger part of the valley landscape, but not a larger part of LCT 117 due to where the boundaries are drawn. Care will be required in this area although the V-Route provides an existing OHL context and character.	Care will need to be exercised at the extreme northern and north-eastern end of the corridor where the route passes into the higher susceptibility LCT 117, although the V-Route here provides context and precedent for OHL development of a larger scale. Compared to corridor A, a larger proportion of the corridor sits within the valley (although not the LCT which doesn't extend this far south), which both provides greater flexibility to detailed routeing, but also a greater level of detailed constraint.	and is perceptually very different from the proposed OHL. Although LCT 93 has a generally lower susceptibility, the remoteness in this location and the exposure increases this. There is no settlement or development within the corridor, although it passes close to isolated development in its extreme eastern parts, where it includes the A7 and the V-Route.	However, due to the enclosure of the river valleys which form part of LCT 93, there is a marginal preference for Route Corridor C.
	Visual Amenity	Key considerations on visual amenity are as follows for Route Corridor A: • The majority of the route passes away from areas of settlement, although in close proximity to isolated dwellings and farmsteads at Commonbrae and Blackcleuch; • In passing along the River Teviot valley, the route could be well backclothed and away from any formal road or walking routes. It would however impact those choosing to walk along this valley which is currently remote and enclosed; • At the northern end of the route, there is a much greater extent of formal access, including minor roads and Core Paths, and also areas of settlement. Any change would however be in the context of the existing V-Route and smaller scale OHLs in this area; and • Trees and vegetation are sparse along the majority of the route, but more notable at the northern end where it could provide effective screening.	Key considerations on visual amenity are as follows for Route Corridor B: • The majority of the route passes away from areas of settlement, although in close proximity to farmsteads at Limiecleuch; • In passing along the valley of the Limiecleuch Burn, the route could be well backclothed and located some distance from the minor road running along Caerlan Rig; • Otherwise the route is located well away from any more significant formal road or walking routes. It would however impact those choosing to walk along this valley which is currently relatively remote and enclosed; • At the northern end of the route, there is a much greater extent of formal access, including minor roads and informal paths, and also areas of settlement. Any change would however be in the context of the existing V-Route and smaller scale OHLs in this area; • Trees and vegetation are sparse along the majority of the route, but much more notable at the northern end where it could provide effective screening for road travellers, walkers and residents; and • Whilst the OS mapping for this area suggests there is a picnic spot alongside the A7 and within this corridor, the location is in fact shut currently.	Key considerations on visual amenity are as follows for Route Corridor C: • The majority of the route passes away from areas of settlement, although between the valleys of the Limiecleuch and River Teviot, over which views would be available. Given the minor road which runs through the centre of this corridor, people are more likely to be walking/driving along this route than perhaps in the valleys either side of Caerlan Rig; • In running along the higher ground between the two valleys, backclothing will be more challenging, although not impossible in longer range views in light of the higher ground to both the east and west. There is an existing small scale OHL which runs along this promontory which provides character references to the baseline; • The route is located away from any more significant formal road or walking routes, although in close proximity to the memorial for Steve Hislop; • To the north of the promontory, the settlement of Teviothead extends onto the higher ground, although is generally surrounded by mature vegetation; • At the northern end of the route, there is a much greater extent of formal access, including minor roads and informal paths, and also areas of settlement. Any change would however be in the context of the existing V-Route and smaller scale OHLs in this area; • Trees and vegetation are sparse along the majority of the route, but much more notable at the northern end where it could provide effective screening for road travellers, walkers and residents; and • Whilst the OS mapping for this area suggests there is a picnic spot alongside the A7 and within this corridor, the location is in fact shut currently.	Key considerations on visual amenity are as follows for Route Corridor D: • The route passes away from areas of settlement and isolated properties, except at the extreme eastern end where the route would terminate adjacent to the A7; and • In passing along the remote Comb Hill there is the potential to impact those choosing to walk along this exposed and rugged area.	All of the routes run through an area limited in formal access, except where corridors would terminate and join the V-Route. The valley areas of Route Corridors A and B would be impacted as remote areas (but with backclothing available), whereas corridor C would be impacted in an area already containing OHL elements, but would be more difficult to backcloth due to the higher elevation. There is therefore no strong preference, but a marginal preference for Route Corridors B and A.

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
Cultural Heritage	**Listed Buildings**	Route corridor A passes closest to the two listed buildings within the Study Area, but they are not within the route corridor. The setting of the listed buildings is an area already impacted by OHL elements and it is not expected that the presence of the proposed OHL in their wider setting would materially affect these assets.	Route corridor B is located c.750m south of the listed buildings at its nearest point. It is not expected that the presence of the proposed OHL in at such a distance would materially affect these assets.	Route corridor C would potentially be visible from Bowanhill, within which the two listed buildings in the Study Area are located. The setting of the listed buildings is an area of settlement already impacted by OHL elements and it is not expected that the presence of the proposed OHL would materially affect these assets.	Route corridor D is located over 4.5km from the listed buildings at its nearest point. It is not expected that the presence of the proposed OHL in at such a distance would materially affect these assets.	There is no strong preference due to the listed buildings in the Study Area being located east of the V-route, in an area already impacted by OHL elements. Each route option therefore has limited potential for effects on listed buildings at Bowanhill.
	Undesignated Archaeology of Regional/ Local Importance (recorded HER)	Route corridor A broadly follows the valley of the River Teviot, while Route Corridor B follows the valley of the Limiecleuch Burn, and Route Corridor C follows the higher ground of Caerlan Rig between the two valleys of the River Teviot and Limiecleuch Burn. For each of these route corridors, the identified undesignated heritage assets largely comprise stock enclosures and discrete areas of settlement or cultivation earthworks and enclosures. Where the route corridors encompass the settlement of Teviothead, the identified assets largely comprise the built form of the settlement. The most notable assets in these route corridors are the settlement and cultivation earthworks in the form of Blackleugh Rig (209210), Caerlan Rig (53010) and Watch Knowe Fort (53011). Physical effects to all these assets could be avoided during detailed route alignment and sensitive micro-routing.			Route corridor D rises west over Comb Hill to the V-Route where no notable assets are identified.	Route Corridor D is preferred as it has the fewest heritage assets of Regional/Local Importance to be avoided during route alignment. The remaining route options would necessitate a degree of consideration of route alignments to avoid assets, but this can be achieved in each instance through sensitive micro-routeing.
Socio-economic and Tourism	**Settlements**	Route corridor A and B would be visible, and potentially prominent, from the settlement of Teviothead where access is likely to be taken and where the OHL from the substation is likely to connect to the V-Route.		Route corridor C would be visible and potentially prominent from long distance views, due to its routing along high ground within the Study Area. It would also be visible from the settlement of Teviothead, where access is likely to be taken and where the OHL is likely to connect to the V-Route.	Route corridor D would be visible from the hamlet of Linhope with potentially long distance views due to the elevated (east-west) nature of the corridor over the high ground between the substation site and the connection point at tower V193 adjacent to the A7 where there is limited vegetation or tree cover. It would also be visible from the settlement of Teviothead, where access is likely to be taken.	Route Corridor C
	Local Businesses	No local businesses will experience direct impacts as a result of any of the routeing options. A number of local businesses may experience visual effects as a result of Route Corridor A: • Colterscleuch House & Cottage (Visitor Accommodation) – Visual effects from the north eastern positioning of the routing corridor along the approach into Teviothead; and • Johnnie Armstrong Gallery (Indoor Tourist Destination) – Visual effects from the north eastern positioning of the routing corridor along the approach into Teviothead. The following local business are considered to be shielded from visual effects of Route Corridor A by Conifer Forest and Native Woodlands however if felled, the following local business may experience visual	No local businesses will experience direct impacts as a result of any of the routeing options. A number of local businesses may experience visual effects as a result of Route Corridor B: • Johnnie Armstrong Gallery (Indoor Tourist Destination) – Visual effects from the north eastern positioning of the routing corridor along the approach into Teviothead. The following local business are considered to be shielded from visual effects of Route Corridor B by Conifer Forest and Native Woodlands however, if felled the following local business may experience visual effects: • Wisp Hill (Recreational Activities in the Open Countryside) – Visual effects from the south eastern positioning of the routing corridor; • Mosspaul Inn (Visitor Accommodation) – Visual effects from the south eastern positioning of the routing corridor; and	No local businesses will experience direct impacts as a result of any of the routeing options. A number of local businesses may experience visual effects as a result of Route Corridor C, particularly as a result of the high ground nature of the routing: • Colterscleuch House & Cottage (Visitor Accommodation) – Visual effects from the north eastern positioning of the routing corridor along the approach into Teviothead; and • Johnnie Armstrong Gallery (Indoor Tourist Destination) – Visual effects from the north eastern positioning of the routing corridor along the approach into Teviothead. The following local business are considered to be partially shielded from visual effects of Route Corridor C by Conifer Forest and Native Woodlands however, if felled the following local business may experience visual effects: • Wisp Hill (Recreational Activities in the Open Countryside): Visual effects from the south	No local businesses will experience direct impacts as a result of any of the routeing options. A number of local businesses may experience visual effects as a result of Route Corridor D, particularly as a result of the high ground nature of the routing: • Wisp Hill (Recreational Activities in the Open Countryside) – Visual effects from the south eastern positioning of the routing corridor; and • Mosspaul Inn (Visitor Accommodation) – Visual effects from the south eastern positioning of the routing corridor. The following local business is considered to be partially shielded from visual effects of Route Corridor D by conifer forest and native woodlands. However, if felled the following local business may experience visual effects: • Ellson Fell (Recreational Activities in the	Route Corridor B

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
		effects: • Wisp Hill (Recreational Activities in the Open Countryside) – Visual effects from the south eastern positioning of the routing corridor; and • Mosspaul Inn (Visitor Accommodation) – Visual effects from the south eastern positioning of the routing corridor.	• Phaup Cottage (Visitor Accommodation) – Visual effects from the mid-section of the routing corridor.	eastern positioning of the routing corridor; • Mosspaul Inn (Visitor Accommodation) – Visual effects from the south eastern positioning of the routing corridor; and • Phaup Cottage (Visitor Accommodation – Visual effects from the mid-section of the routing corridor.	Open Countryside) – Visual effects from the south eastern positioning of the routing corridor.	
	Visual Amenity	Users of the A7, Borders Historic Route and the local businesses above identified may experience changes to visual amenity across all route options. This is likely to be more prominent when traveling south along the A7 from Teviothead, where access is likely to be taken and where the OHL is likely to connect to the V-Route. Views of Route Corridor A and B are likely to be interspersed between exiting vegetation, conifer forest and native woodlands. The routeing will also be positioned within the context of existing pylons and telegraph poles. Route Corridor A and B generally stay lower within the surrounding valleys, compared to Route Corridors C and D, resulting in a reduced potential for skylining.		Users of the A7, (A7) Borders Historic Route and the local businesses above identified may experience changes to visual amenity across all route options. This is likely to be more prominent when travelling south along the A7 from Teviothead, where access is likely to be taken and where the OHL is likely to connect to the V-Route. Route corridor C and D would be positioned on higher ground within the Initial Scoping Area, which may make them particularly visually prominent or result in skylining along ridge lines. Views are also anticipated to be interspersed between existing vegetation, conifer forest and native woodlands. The routeing will also be positioned within the context of existing pylons and telegraph poles. Route Corridor D is unlikely to benefit from screening as it crosses the open hill ground around Comb Hill and drops to the V-Route (tower V193) in the valley below. This route is likely to have the greatest impact on visual amenity.		Route Corridors A or B
	Core Paths and other Rights of Way	Route corridor A may result in visual impacts from the following rights of way, however these are likely to be interspersed due to the lower lying position of the routing: • BR70; • BR71; and • B263.	Route corridor B may result in visual impacts from the following rights of way, however these are likely to be interspersed due to the lower lying position of the routing: • B263; and • BR77.	The high ground position of Route Corridor C may result in long distance views or skylining from the following rights of way: • BR71; • B263; and • BR77. Rights of way BR71 and B263 may be directly impacted by Route Corridor C within the settlement of Teviothead. This is where access is likely to be taken and where the OHL is likely to connect to the V-Route.	No Core Path, Permissive Custom Path or right of way will be directly crossed by Route Corridor D. The high ground position of Route Corridor D may result in long distance views or skylining from the following rights of way: • BR77; and • BR79.	Route Corridor B
Land Use	**Forest and Woodland**	The coniferous woodland grouping to the immediate east of the substation may be affected by wayleave requirements for any OHL. It is, however, of note that this area has been felled or is managed in a 30-50 year clearfelling and restocking programme	The coniferous woodland grouping to the immediate east of the substation may be affected by wayleave requirements for any OHL. It is, however, of note that this area has been felled or is managed in a 30-50 year clearfelling and restocking programme	The coniferous woodland grouping to the immediate east of the substation may be affected by wayleave requirements for any OHL. It is, however, of note that this area has been felled or is managed in a 30-50 year clearfelling and restocking programme	The coniferous woodland grouping to the immediate east of the substation may be affected by wayleave requirements for any OHL. It is, however, of note that this area has been felled or is managed in a 30-50 year clearfelling and restocking programme	Route Corridor A or B
	Access	The northern portion of the route corridor contains an area of native woodland. However, this is unlikely to be affected as the approved access track for the wind farm will not cross into the woodland boundary.			The western portion of the route corridor contains an area of forest plantation. However, this is unlikely to be affected as the approved access track for the wind farm will not cross into the woodland boundary. There may be some requirement to provide a wayleave through the woodland block to allow for access to the OHL.	Route Corridor C is serviced by an existing road along Caerlan Rig, which could provide access for a new OHL within this corridor.
Flood Risk and Hydrology	**Functional Floodplains**	Functional floodplain routeing along valley floor from River Teviot. Connection into the existing network may be located in functional floodplain.	Functional floodplain routing along valley floor from Limiecleuch Burn. Connection into the existing network may be located in functional floodplain.	Connection into the existing network may be located in functional floodplain.		Route Corridor C
	Watercourse Crossings	At least two crossings of the watercourse would be made by the OHL. Access tracks for construction to cross River Teviot in several locations.	Crossing of the watercourse would be made by the OHL. Access tracks for construction to cross Limiecleuch Burn in several locations.	Crossing of Limiecleuch Burn or River Teviot at downstream end of OHL route.		Route Corridor C
	Access Track Drainage	Access tracks intercept natural drainage paths/surface water runoff.	Access tracks intercept natural drainage paths/surface water runoff.	Access tracks intercept natural drainage paths/surface water runoff.	Access tracks intercept natural drainage paths/surface water runoff.	Route Corridor C

Technical Topic	Detailed Consideration	Route Corridor A	Route Corridor B	Route Corridor C	Route Corridor D	Preference
Other Issues (Traffic and Transport, Noise, Human Health, etc.)	**Longer and/or Abnormal Loads**	Teviothead (small village and civil parish) will be affected by abnormal loads passing along the Caerlan Rig road which is abutted by residential uses and the parish church. Users of the A7 particularly around the junction to Teviothead will be impacted due to egress and ingress of vehicles from the junction. The A7/Falnash access junction would be affected by abnormal loads but has recently benefitted from improvement works by Scottish Power at the northerly extents of the Teviot Valley, which include an upgraded/reinforced bridge over the River Teviot, would pose a feasible option for OHL construction access for Route Corridors A and C.	Teviothead (small village and civil parish) will be affected by abnormal loads passing along the Caerlan Rig road which is abutted by residential uses and the parish church. Users of the A7 particularly around the junction to Teviothead will be impacted due to egress and ingress of vehicles.	Teviothead (small village and civil parish) will be affected by abnormal loads passing along the Caerlan Rig road which is abutted by residential uses and the parish church, cemetery and church hall. Users of the A7 particularly around the junction to Teviothead will be impacted due to egress and ingress of vehicles from the junction. The A7/Falnash access junction would be affected by abnormal loads but has recently benefitted from improvement works by Scottish Power at the northerly extents of the Teviot Valley, which include an upgraded/reinforced bridge over the River Teviot, would pose a feasible option for OHL construction access for Route Corridors A and C	Users of the A7 would be affected by abnormal loads using the route to access the route corridor.	Route Corridor A, B or C
	Traffic Related Noise and Vibration	Building structures at Teviothead, in particular the parish church and cemetery as they are immediately adjacent to the public road, may be impacted by noise and vibration from larger vehicles if the Caerlan Rig route is used for access. Other impacted properties include residential properties; mature trees/tree canopy; and Teviotdale village hall along this route. Trees and the bridge over the Falnash Burn may be impacted were access to be taken to the very north of this route corridor to connect to the V-Route. Ongoing checks and maintenance by smaller vehicles will have no effect beyond that of normal usage of the public road.				Route Corridor A or C
	Baseline Traffic Flows and Composition on A7	Road capacity may be affected by the additional activity, including construction traffic and operation and maintenance traffic. In particular the following locations may experience change: Teviothead (small village and civil parish); Users of the A7; Users of the Falnash Burn/A7 Junction			Users of the A7 may be impacted by a new junction onto A7 to facilitate construction.	Route Corridor A, B or C
	Gradients and Soil Conditions	Soil conditions may be affected by the access route for installation of the OHL which will need to be free of stumps, timber, holes and any unevenness which would restrict the progress of vehicles along the OHL route during construction. There is no opportunity to take short spurs from an existing access track through Route Corridor A.	Soil conditions may be affected by the access route for installation of the OHL which will need to be free of stumps, timber, holes and any unevenness which would restrict the progress of vehicles along the route during construction. There is opportunity to take short spurs from the proposed wind farm access road along the Limiecleuch burn in Route Corridor B to minimise the construction of temporary access for the OHL installation.	Soil conditions may be affected by the access route for installation of the OHL which will need to be free of stumps, timber, holes and any unevenness which would restrict the progress of vehicles along the route during construction. There is opportunity to take short spurs from the Caerlan Rig road which will minimise the need for new access tracks. Route corridor C along Caerlan Rig offers the best opportunity to minimise construction of temporary access tracks for the installation of the OHL by taking short spurs from the existing road.	Soil conditions may be affected by the access route for installation of the OHL which will need to be free of stumps, timber, holes and any unevenness which would restrict the progress of vehicles along the route during construction. There are also steep gradients along this route over the summit of Comb Hill and dropping down toward the A7 to the east. There is opportunity to take short spurs from an existing access track to the mast site on Comb Hill which will minimise the need for new access tracks but this would not be possible on the eastern end of the route corridor down to the V-Route (tower V193) adjacent to the A7.	Route Corridor C
Geology and Ground Conditions	**Compressible Ground Hazards in Alluvium or Peat deposits** **Possible Shallow Bedrock** **Landslip Hazards on Steep Slopes**	The following features need consideration: • Peat on Blackcleuch Rig ridge. Alluvial deposits along the River Teviot and in the area to the north and west of Teviothead. Otherwise where present superficial deposits are Glacial Till; • Shallow bedrock indicated across flanks and tops of Blackcleuch Rig ridge and Rowantree Hill. Comprising Greywacke and interbedded silty mudstone with thin red mudstone beds and laminated fossiliferous carbonaceous siltstone beds. Dykes or isolated unnamed igneous intrusions on Blackcleuch Rig ridge; and • Evidence of lobate or elongated earthflows on steeper sections of Blackcleuch Rig ridge.	The following features need consideration: • Alluvial deposits along Limiecleuch Burn, Frostlie Burn and in the area to the north and west of Teviothead. Otherwise where present superficial deposits are Glacial Till; and • Shallow bedrock indicated across flanks of Limiecleuch Hill and Limie Hill. Comprising Greywacke and interbedded silty mudstone with thin red mudstone beds and laminated fossiliferous carbonaceous siltstone beds.	The following features need consideration: • Alluvial deposits along Limiecleuch Burn, Frostlie Burn and the River Teviot. Alluvial deposits in the area to the north and west of Teviothead. Otherwise where present superficial deposits are Glacial Till; and • Shallow bedrock indicated across flanks of Blackcleuch Rig ridge and Limiecleuch Hill. Comprising Greywacke and interbedded silty mudstone with thin red mudstone beds and laminated fossiliferous carbonaceous siltstone beds.	The following features need consideration: • Alluvial deposits along Black Burn. Otherwise where present superficial deposits are Glacial Till; • Shallow bedrock indicated across flanks and top of Comb Hill. Comprising Greywacke and interbedded silty mudstone with thin red mudstone beds and laminated fossiliferous carbonaceous siltstone beds; and • Evidence of possible rotational earthflow slides on southern side of Lang Hope valley.	Route Corridor C

Summary of Route Corridor Appraisal

R7.1.20 The above review of route corridors sets out the detail of each one with reference to the range of principles against which the acceptability of a route corridor is judged. It is clear from this review that whilst many of the corridors can be rated similarly against one or more of the principles, there are some corridors that 'score' better against one or more criteria. The table below summarises the preferred route corridor for each technical and environmental area.

Table 7.3: Route Corridor Preference Summary

Environmental Topic	Preference
Length of Route	Route Corridors B or C
Biodiversity	
River Tweed SAC/SSSI	Route Corridor C
Protected and Notable Species (Ornithology)	Route Corridor B
Protected Species and Notable species (Ecology)	Route Corridor C
Priority Habitats	Route Corridor C
Landscape & Visual	
Residential Amenity	Route Corridors A, B or C
Landscape Character	Route Corridor C
Visual Amenity	Route Corridor A or B
Cultural Heritage	
Listed Buildings	Route Corridors A, B, C or D
Undesignated Archaeology of Regional/ Local Importance (HER)	Route Corridor D
Socio-economic and Tourism	
Settlements	Route Corridor C
Local Businesses	Route Corridor B
Visual Amenity	Route Corridors A or B
Core Paths and Other Rights of Way	Route Corridor B
Land Use	
Forest and Woodland	Route Corridor A or B
Access	Route Corridor C
Flood Risk & Hydrology	
Functional Floodplains	Route Corridor C
Watercourse Crossings	Route Corridor C
Access Track drainage	Route Corridor C
Other Issues (Traffic and Transport, Noise, Human Health, etc.)	
Longer and/or Abnormal Loads	Route Corridor A, B or C
Traffic Related Noise and Vibration	Route Corridor A or C
Baseline Traffic Flows and Composition on A7	Route Corridor A, B or C
Gradients and Soil Conditions	Route Corridor C
Geology and Ground Conditions	Route Corridor C

Consideration and Appraisal of Detailed Routeing Options

R7.1.21 Following the identification of the Preferred Route Corridor, the next stage is to identify how, within Route Corridor C, the Preferred Route itself might be aligned. This does not necessarily require the identification of a single route linking the Faw Side substation to the V-Route, rather it identifies a range of options (such as these exist) that will be appraised for their suitability based upon more detailed constraints as were considered during the identification of the preferred corridor.

R7.1.22 The routeing has followed the sequential process outlined in the Holford Rules and supplementary guidance (included at **Appendix 1**). It is not possible to avoid every individual constraint within the search area, even during the detailed routeing stage, but with careful consideration as to the location and level of the constraint, a Preferred Route through the landscape can been identified. This approach has been the driver in seeking to find the appropriate balance between the technical requirements and potential environmental effects of the route.

R7.1.23 The identification of a number of route options has enabled a balanced view to be taken of which route should be preferred on the basis of the known environmental constraints and the requirements of the Holford Rules and other guidance.

R7.1.24 The combination of the alignment identified, the technical approach adopted and the physical form of the OHLs are considered to offer the best opportunity for SPT to comply with its obligations as the Transmission Licence holder in meeting its Schedule 9 commitments whilst providing the required connection for the proposed wind farm.

R7.1.25 The Holford Rules provide the overarching guidance on routeing OHLs, with perhaps the most pertinent rule being that the OHL should, where possible, follow the most direct line. In terms of further guiding the detailed routeing of the OHL, on the basis of professional opinion the following more detailed issues require consideration:

- Ensure a general fit with, and use of, localised topography where possible;
- Consider at all times the visibility of the route and avoid local high points;
- Ensure the route considers offsets and views from residential properties;
- Ensure route crosses roads and watercourses perpendicular to these features;
- Ensure offsets to existing and proposed electrical infrastructure of 40m;
- Minimum offsets to watercourses; and
- Avoidance, as far as is practicable, other identified environmental constraints.

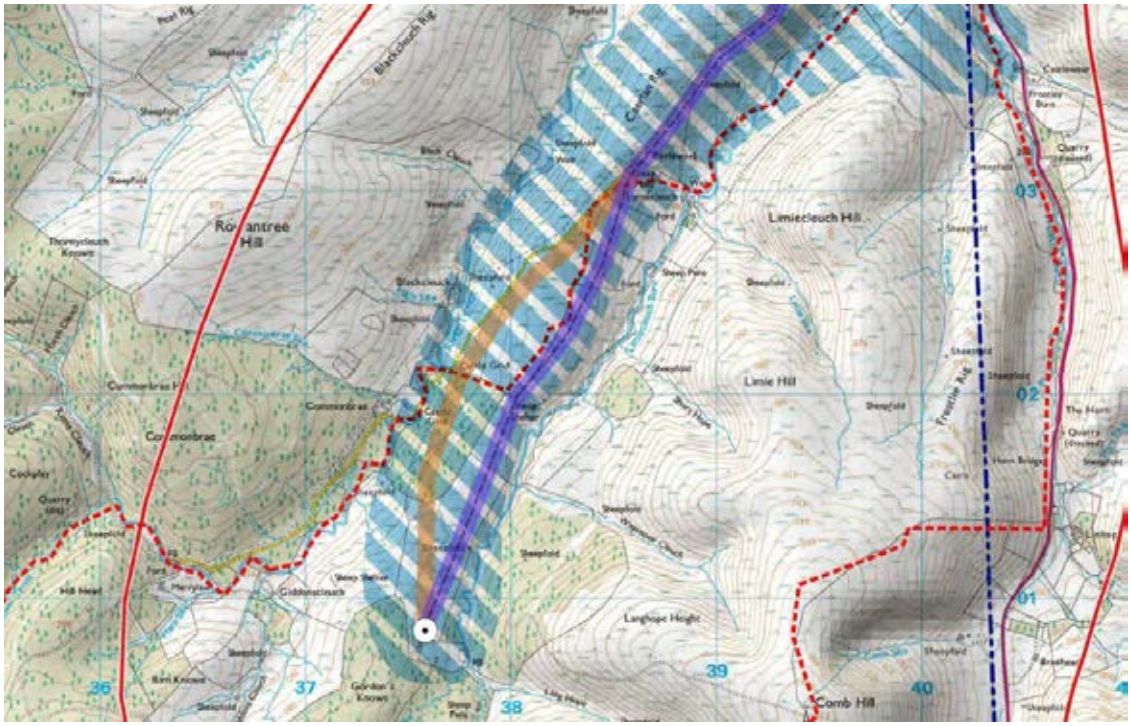
R7.1.26 The consideration of the route options has been informed by the data available from desk study, site survey and professional judgement. Parts of the Study Area have relatively detailed information available from recent EIA studies completed by the individual developers of the proposed wind farms and OHLs, and this information has been obtained and referred to as part of this routeing exercise.

Detailed Routeing Options

R7.1.27 The Preferred Route Corridor (Corridor C) runs in a north/south direction from the substation, and comprises the western side of the Limiecleuch Burn valley, the elevated spur of Caerlan Rig and the eastern side of the River Teviot valley. The principal constraints within this corridor relate to the steep ground on either valley side, the presence of a number of isolated dwellings, clustering of dwellings (at Teviothead at the northern end of the corridor) and the existing low voltage OHL running broadly along the road along Caerlan Rig.

R7.1.28 Running north from the substation there are two main options for the route of the OHL – either following the line of the Limiecleuch Burn (on its western side) or heading on a more northerly direction towards Blackcleuch. These two indicative routes are shown in **Image 7.1** below.

Image 7.1: Southern Section Routeing Options

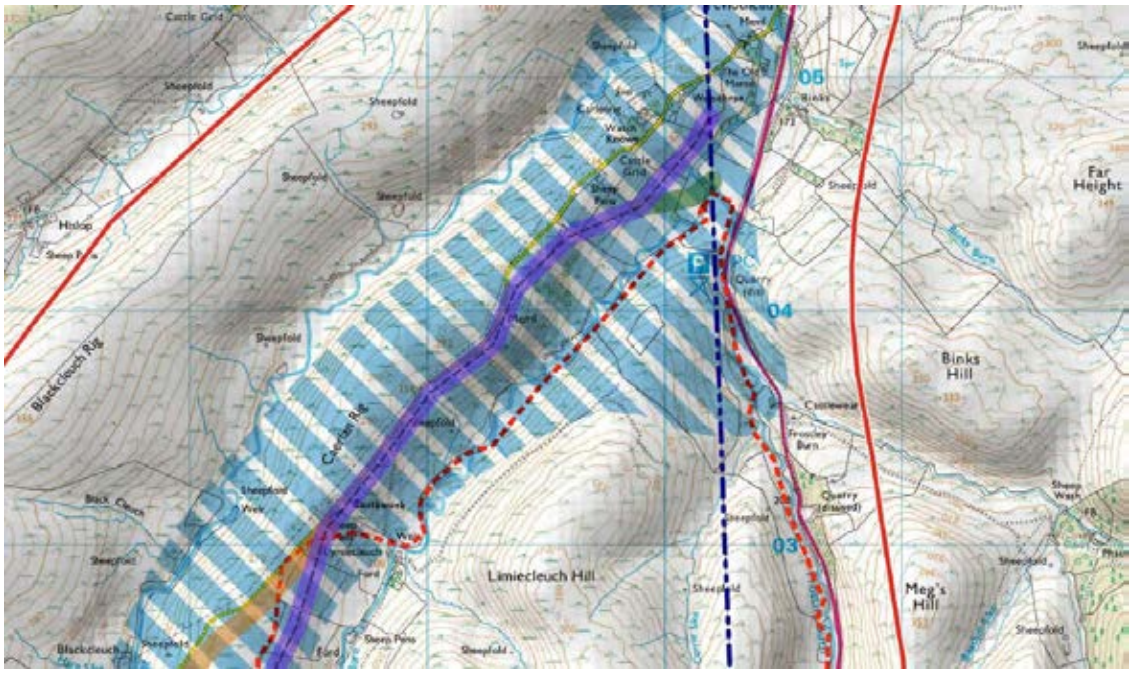


R7.1.29 Either option would be able to accommodate the routeing without significant impingement on identified constraints, but the routeing option towards the Limiecleuch Burn is generally preferred for the following reasons:

- The OHL would be located away from the residences at Commonbrae and Blackcleuch, and also the minor road linking these dwellings to Teviothead;
- The topography allows the OHL to be largely 'hidden', sat as it would be between the higher ground to the west and the lower lying Limiecleuch Burn to the east;
- From a visual perspective, the OHL would be largely backclothed when viewing from the west by the woodland immediately to the east of the Limiecleuch Burn;
- The OHL would avoid the area of forestry to the east of Commonbrae, and the compensatory requirements of its potential loss;
- The route avoids the local highpoint adjacent to the minor road, which sits at c.280m aOD; and
- The distribution of landscape elements, topography, and other road and OHL infrastructure, mean a much more direct route can be followed, requiring fewer deviations.

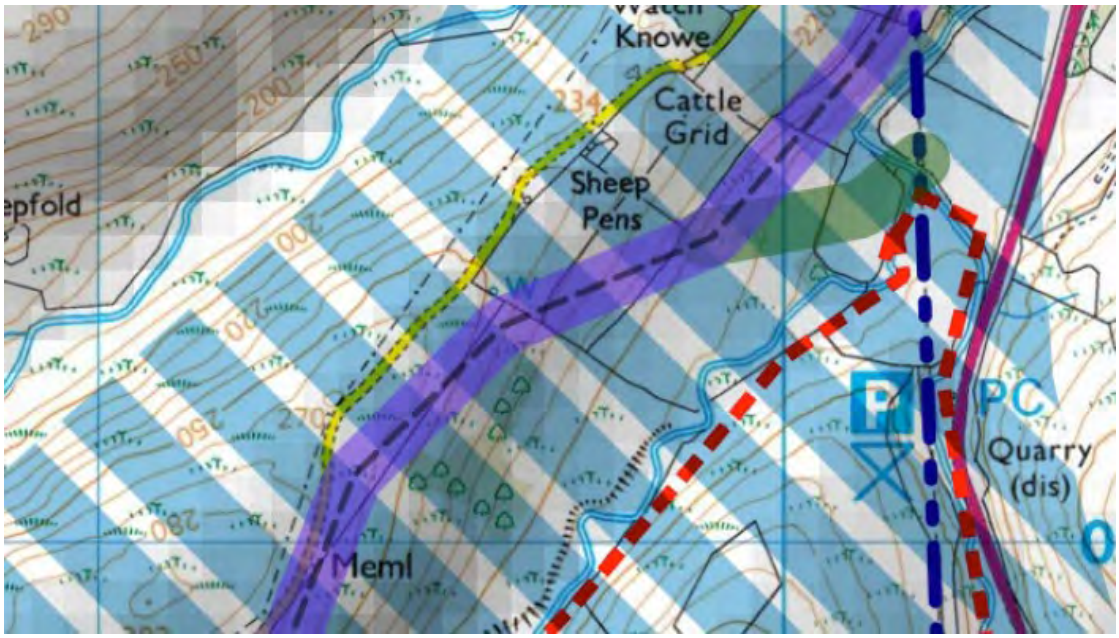
R7.1.30 Along the middle section of the route – as shown on **Image 7.2** below – the route broadly follows the line of the minor road (on its eastern/lower side). The main constraints along this section (as shown on **Figures 6**, **7** and **18**) are the areas of steeply sloping ground between the minor road and the Limiecleuch Burn, the existing small-scale OHL which runs along the road's western/upper side and the presence of the residential dwelling at Lymiecleuch. Further down the slope towards the Limiecleuch Burn, there are also hydrological constraints to consider and avoid. The route selected avoids all of these constraints and does not fall within the trigger zone for residential dwellings.

Image 7.2: The Middle Section of the Preferred Route



R7.1.31 As the OHL approaches Teviothead, the local constraint presented by the Ancient Woodland, and shown on **Image 7.3** below, requires that the OHL 'threads' its way between the woodland and the sheep pens and properties on the southern extent of the village. The slope constraints are not so extensive in this area, so this reduction in elevation can occur without conflict in this respect.

Image 7.3: Localised Woodland Constraint



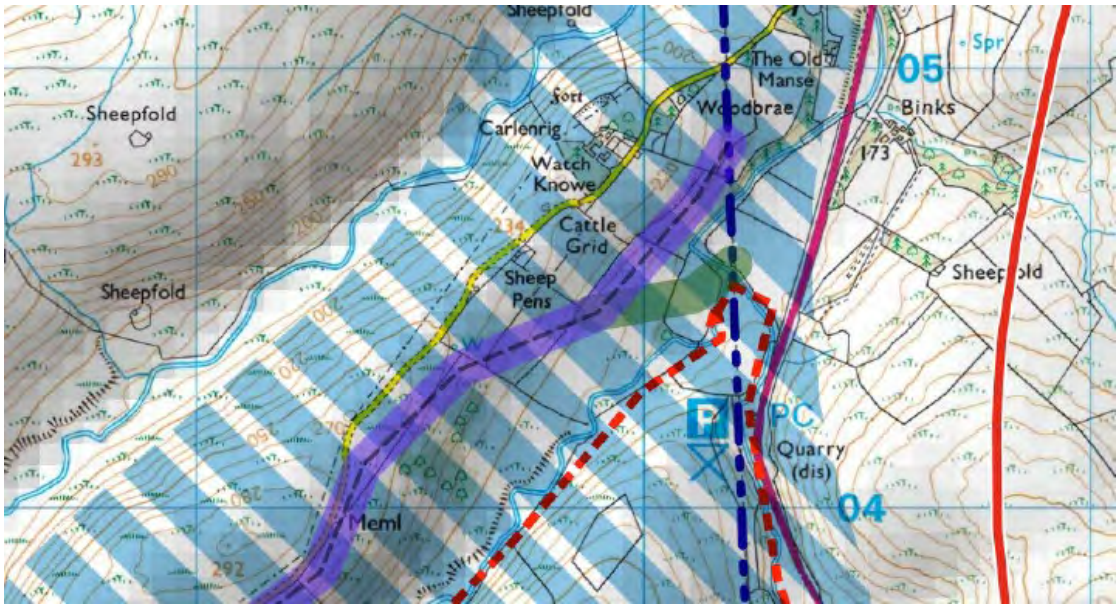
R7.1.32 At the northern of the route, there is only potential for the OHL to route south of the dwellings forming the southern part of Teviothead. Whilst the route corridor provides the potential for a route that travels north of these dwellings, a number of constraints exist which limits this potential:

- The existing OHL running along the northern side of the minor road would need to be crossed, which would require either undergrounding of a section, or a re-routeing of the line in its entirety;

- Beyond the existing OHL the hard slope constraints would present the OHL from descending into the River Teviot valley;
- Even if the OHL were able to route into the River Teviot valley, the hydrological constraints would be significant owing to the functional floodplain surrounding the watercourse; and
- The River Teviot and its surroundings comprise an SAC and a SSSI, meaning ecological constraints would restrict routeing opportunities.

R7.1.33 Despite the above, there are options for the routeing in this area, assuming a route which routes east of the dwellings at Teviothead and which follows the Limiecleuch Burn valley, as shown on **Image 7.4** below. Whilst the Preferred Route remains on the marginally higher ground, and suggests a connection to the V-Route tower on the northern side of the burn, there is an option which seeks to use a shorter route, but which requires a river crossing, and impinges on the functional floodplain surrounding the burn to a greater extent.

Image 7.4: Northern Section Routeing Options



R7.1.34 This option would join the left-hand V-Route tower shown on **Image 7.5** below, whereas the Preferred Route would join the right hand tower, visible beyond the intervening woodland belt.

Image 7.5: Potential V-Route Connection Towers

R7.1.35 Although the Preferred Route as indicated above would be marginally longer than the option shown in green, the avoidance of other constraints – the floodplain and the river primarily – still result in the blue line being preferred. There would also be a marginal preference from a visual perspective, with more limited visual change anticipated for the main road and receptors using this. The Preferred Route, based upon the above consideration of detailed options, is illustrated on **Figure 19**.

R8. Stage 4: Identification and Appraisal of the Preferred Route

R8.1.1 The total length of the Preferred Route shown **Figure 19** is c.5km. This route is to be adopted as the Preferred Route corridor for the purposes of consultation and until such time as this is revised to form the Proposed Route. The Preferred Route has been identified following a systematic process of addressing the range of technical, environmental and economic constraints within the Study Area and in line with the guidance provided by the Holford Rules (and their appendices) and the routeing strategy identified for use on this project.

R8.1.2 In passing through an environment that contains little in the way of urban settlement or population, and in this sense has a predominantly rural character, the Preferred Route, as per any new infrastructure development of around 5km in length, will result in a number of potential residual environmental effects. In following the systematic and hierarchical routeing process adopted, the extent of residual effects has been minimised as far as possible. The principal residual effects of the Preferred Route, as described above, and illustrated on **Figure 19**, are summarised below with reference to the area of the environment potentially affected.

Forestry and Woodland

R8.1.3 Assuming a worst-case routeing within Route Corridor C, there will be limited forestry loss, confined to the area near the wind farm substation. Localised routeing may offer the opportunity to avoid such loss given the extent of recent felling in the area.

Residential Amenity

R8.1.4 The route would pass close to a number of residential properties, with the closest likely to be those at Teviothead, Lymiecleuch, Blackcleuch or Commonbrae. In the context of the overall route, the potential effect on residences is considered to be limited, although close consideration of SPEN's trigger for consideration zone will be required when routeing at the detailed level. Furthermore, proximity to dwellings is not the only factor to consider; even though these properties may be close to the OHL, there may be screening, topography or other factors that result in any effects experienced being of a limited magnitude.

Socio-economic and Tourism

R8.1.5 The Preferred Route is unlikely to have any direct impact on settlements, with the exception of Teviothead – where access is likely to be taken and the OHL is likely to pass. The Preferred Route helps to minimise the extent of impacts by routeing the OHL through an area where electricity infrastructure is already present.

R8.1.6 Users of the A7, which connects Galashiels in the Scottish Borders with Hawick, and the Borders Historic Route may experience visual effects as a result of the Proposed Development (primarily around Teviothead where connection to the V-Route is likely). However, pylons are an existing and established part of the landscape, which may have a bearing on the likely significance of the impact.

R8.1.7 A number of local businesses: (Phaup Cottage (Visitor Accommodation); Teindside Lodge (Visitor Accommodation); Wisp Hill (Recreational Activities in the Open Countryside); and Johnnie Armstrong Gallery (Indoor Tourist Destination) may experience visual effects from the route. This is primarily anticipated to occur around Teviothead, where a connection is likely to be made with V-Route. Visual effects may also be experienced by users of the following rights of way: BR71; B263; BR77. In both instances, pylons are an existing and established part of the landscape, which may have a bearing on the likely significance of the impact.

R8.1.8 The construction of the Proposed Development is likely to give rise to temporary labour market effects. Additional turnover to the construction sector, in the form of capital expenditure, will temporarily support employment on site. This increased turnover and associated employment will give rise to net additional output from those firms involved, resulting in a total net additional Gross Value Added (GVA). This in turn acts as a stimulant for the wider construction sector, whilst inducing multiplier effects throughout the sector. The construction of the Proposed Development may also give rise to visual amenity impacts on tourism activity within the Study Area. These construction stage effects would be experienced as a result of construction the OHL in any of the potential routes.

R8.1.9 The operational period of the Proposed Development is not anticipated to give rise to employment or draw visitors to the sit. However, the importance of the tourism economy to the local area and the potential for visual amenity impacts on a number of local businesses (as noted above) from the Proposed Development is acknowledged.

R8.1.10 There is the potential for the identified potential effects to be significant in the context of the EIA Regulations. As such, an assessment of likely socio-economic and tourism effects from the Proposed Development requires to be included within the EIA.

R8.1.11 In summary the Proposed Development is likely give rise to those effects identified above, namely:

- Temporary construction employment: resulting from increased sector turnover from capital expenditure;
- Effects on the construction sector: resulting from increased output and value added by firms on site and associated multiplier effects; and
- Effects on the tourism and accommodation sector: resulting from direct and potential visual amenity impacts during the construction and operation of the Proposed Development.

Hydrological Issues

R8.1.12 Route corridors A and B would be likely to include construction of the OHL and access track in parallel to, or within, the functional floodplains of the River Teviot and Limiecleuch Burn. Route Corridor C makes it much easier to avoid these due to its elevated location along the ridge line, as is shown by the Preferred Route.

R8.1.13 The connection into the existing network is likely to be located in an area within the functional floodplain. However, for operational reasons, this may not be possible to avoid, and so design and construction will require to be tailored to suit these conditions. Where possible, the floodplain should be avoided, and any construction within it should not change ground levels which could have an impact upon the floodplain dynamics.

R8.1.14 Access tracks for the construction of the OHL will require to be routed through areas which are currently undeveloped, and these tracks may present barriers to existing surface water flow paths, and in some cases create newly routed flow paths. Unlike routes A, B and D, Route Corridor C would make it easier to reduce the extent of new tracks which could impact upon natural flow regimes on the hillsides. The Preferred Route would therefore have less of an impact than other potential options due to its location largely on the top of the ridge line, with a smaller potential contributing catchment area.

R8.1.15 Access track construction would likely require watercourse crossings in both routes A and B, particularly where the river corridors become narrow in their north-eastern ends. Route Corridor C and the Preferred Route could potentially avoid watercourse crossings.

Ecology and Ornithology

R8.1.16 The Preferred Route avoids all known ecological designations located within the Study Area, including the River Tweed SAC and its constituent SSSI, which runs nearby to the south-east and north-west.

R8.1.17 In terms of woodland, the route includes a small amount of Ancient Semi-natural Woodland, although it should be possible to avoid direct impacts upon this through micro-siting of the OHL.

R8.1.18 The Preferred Route passes along the Caerlan Rig, which appears to support grassland habitats of lesser conservation value than those found in the valleys either side. Furthermore, the area is grazed by cattle and is therefore less suitable for reptiles, which will allow minimal disturbance to these species and loss of suitable habitat.

R8.1.19 In terms of commercial woodland, Route Corridor C contains a small amount of coniferous plantation just to the north of the proposed substation, with records of red squirrel and anecdotal evidence of breeding goshawk. Despite a small amount of potential direct habitat loss, in adopting suitable mitigation measures, or routeing as per the Preferred Route, it should be possible to avoid undue harm to squirrel, badger or pine marten populations.

Landscape and Visual

R8.1.20 Route Corridor C runs broadly between the valleys of the River Teviot and Limiecleuch Burn, and in so doing passes for the most part across a higher spur of ground named locally as Caerlan Rig. This spur is of a much lower elevation than those ridges/hills to the east (Comb Hill and Limie Hill) and the west (Blackcleuch Rig) and therefore in longer distance views skylining would be more limited than would otherwise be the case. There will be some local skylining when viewed at closer proximity but when balanced with the avoidance of conflict with other landscape and visual aspects, this is considered to be acceptable.

R8.1.21 Given the remoteness/rurality of the valley landscapes, it is unsurprising that the minor access road to Commonbrae and Blackcleuch (and other isolated dwellings) runs along this spur, as do the small-scale overhead distribution lines (which broadly follow the road corridor). Despite this infrastructure, there are no dwellings along the majority of the route corridor, with those at the southern periphery of Teviothead, at the northern end of the spur, being the only ones consistent with it.

R8.1.22 As with all the route corridors, there is the need at the northern end of Route Corridor C to move from the more remote and upland landscape, into the more settled and pastoral one in and around Teviothead. The distribution of dwellings in Teviothead means that there is the potential to route without impacting significantly on private residences. Indeed, there is likely to be scope to route the OHL well away from most residences. Detailed routeing will address this detail as part of the subsequent routeing stages.

Cultural Heritage and Archaeology

R8.1.23 In terms of high value cultural heritage assets, Route Corridor C does not contain the two listed buildings identified within the Study Area at Bowanhill. In any event, these listed buildings are located east of the V-Route, in an area already impacted by OHL elements. Route Corridor C therefore has limited potential for effects on the setting of the listed buildings at Bowanhill.

R8.1.24 Route Corridor C incorporates a number of identified undesignated heritage assets, largely comprising stock enclosures and discrete areas of settlement or cultivation earthworks and enclosures, as well as the historic built form of the settlement of Teviothead. It also includes notable

assets in the form of Blackleugh Rig (209210), Caerlan Rig (53010) and Watch Knowe Fort (53011). Physical effects to all these assets could be avoided during detailed route alignment and sensitive micro-routeing.

Geology and Ground Conditions

R8.1.25 Route Corridor D and the western edge of Route Corridor A comprise areas of peat. Alluvial deposits are found within Route Corridors A, B and C, mainly confined to river courses and the valley floor around Teviothead. Superficial deposits, chiefly comprising glacial till, are found within all route corridors. Alluvium and peat are considered to be a compressible ground hazard and potential constraint to OHL foundations.

R8.1.26 Shallow bedrock is indicated across the flanks and tops of the hills and ridges of all the potential route corridors. The greater proportion of shallow bedrock is indicated in Route Corridors A, B and D. The solid geology generally comprises thin to medium bedded greywacke throughout all route corridors. Shallow bedrock is a possible constraint to foundation construction of the wooden support poles.

R8.1.27 Evidence of landslip features (possible lobate or elongated earthflows) are shown on steeper slopes within Route Corridors A and D. These ground stability features constrain where the support poles could be placed.

R8.1.28 Route Corridor C generally contains fewer steeper slopes and consequently the lowest likelihood of landslide ground stability hazards. Generally, the superficial geological deposits are more favourable in Route Corridor C and the indicated area of shallow bedrock is the lowest of the four corridors.

R9. Next Steps

R9.1 Stage 5: Consultation and Refinement

R9.1.1 For developments of this nature, it is considered best practice to undertake consultation on the Preferred Route prior to identification of the Proposed Route upon which the environmental appraisal will be carried out. Whilst this Routeing Consultation Document takes account of all known environmental constraints in identifying a Preferred Route, more locally available information, or that provided by statutory consultees, can be invaluable in finalising the route detail.

R9.1.2 This document forms the main method by which consultation occurs at the early stages of the project, and in order to capture the widest range of possible consultations, this document will be issued to all those consultees listed in Section R10. In addition, public exhibitions (virtual where a physical event can't be undertaken) will be held during this stage so that the local population can discuss the project with members of the project team.

R9.2 Stage 6: Identification of Proposed Route

R9.2.1 At the conclusion of the consultation process, a Proposed Route will be selected by SPEN after consideration of:

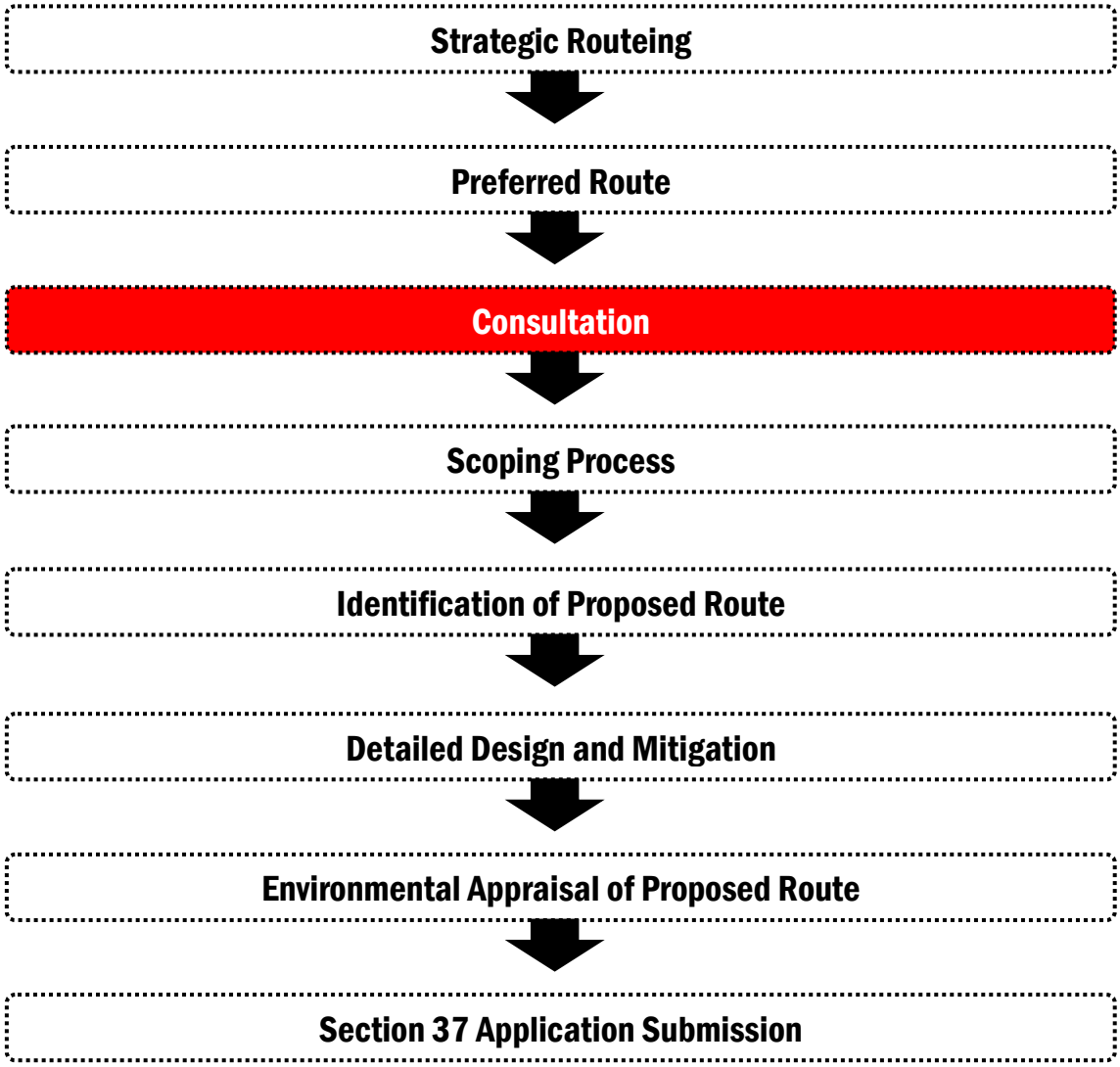
- All the comments and responses made by statutory and other interested parties during the consultation process;
- The appraisal of options considered; and
- Having regard to all other matters SPEN consider relevant.

R9.2.2 If screened as an EIA development, SPEN will issue a Scoping Request to the Scottish Ministers under Regulation 7 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000, as amended 2008, for a Scoping Opinion on the information to be included within the EIA Report. The Scoping Request will set out the proposed structure and content of the EIA Report and identify the potential effects on the environment of the Proposed Route.

R9.2.3 Either following the receipt of a Scoping Opinion from the Ministers (if required), or as part of the wider environmental appraisal process, further detailed studies will be undertaken to define the Proposed Route, which will be taken forward for the preparation of the Section 37 application and (if required) the EIA. The EIA Report or Environmental Report, which presents the findings of the environmental appraisal, would provide a detailed visual and environmental appraisal of the Proposed Route and will include all appropriate mitigation measures. Computer aided techniques will be used to assist the evaluation of the visual effects of the Proposed Route.

R9.2.4 The EIA Report or Environmental Report will report on all the likely environmental effects (and their significance if EIA) arising from the construction and operation of the proposed OHLs. The ES will incorporate relevant information from this document and the consultation process. Following further detailed environmental and technical assessment, it may identify local deviations from the Proposed Routes in order to mitigate local effects.

R9.2.5 The flow diagram below illustrates this process of route identification and assessment, and identifies the stage reached to date.


Strategic Routeing
Preferred Route
Consultation
Scoping Process
Identification of Proposed Route
Detailed Design and Mitigation
Environmental Appraisal of Proposed Route
Section 37 Application Submission

R10. Consultees and Contact Information

R10.1.1 The following table identifies the consultees who have been/will be included in this consultation process. This list seeks to provide a wide range of consultees and stakeholders with the opportunity to understand the proposals and the reason for them. SPEN actively seeks comment from all stakeholders to inform this project.

Table 10.1: Consultees Included in this Consultation Process

Consultee Name
Tier 1: Statutory Consultees (provided with paper copies of all documentation)
Dumfries and Galloway Council
Borders Council
Historic Scotland
Scottish Natural Heritage
SEPA
Tier 2: Non Statutory (provided with leaflet and CD copy of documentation)
Association of Salmon Fishery Boards
Scottish Forestry
Marine Scotland
Ministry of Defence
Royal Society for the Protection of Birds
Scottish Government Library
Scottish Water
Scottish Wildlife Trust
The Coal Authority
West of Scotland Archaeology Service
Tier 3: Other Consultees (leaflet only)
Architecture and Design Scotland
British Horse Society
British Trust for Ornithology Scotland
BT
Civil Aviation Authority
Defence Infrastructure Organisation
DEFRA
Scottish Badgers
Game & Wildlife Conservation Trust
Garden History Association
General Teaching Council (GTC)
Health and Safety Executive
Independent Power Networks
John Muir Trust
Mountaineering Council of Scotland

Consultee Name
National Air Traffic Services
National Farmers Union
National Grid (Prev Transco)
National Trust for Scotland
Network Rail
Nuclear Safety Directorate (HSE)
OfCom
RAF
Ramblers Association (Scotland)
Scottish Squirrels – Teviot and Borthwick
Rivers and Fisheries Trusts for Scotland
Royal Commission on Ancient & Historic Monuments
Scottish Badgers
Scottish Outdoor Access Network (SOAN)
Scottish Rights of Way and Access Society (ScotWays)
Shell UK Ltd
Sustrans Scotland
The Crown Estate
The Woodland Trust
Transport Scotland
Visit Scotland

R10.1.2 In undertaking this consultation, those organisations identified within Tier 1 will be provided with copies of this Routeing Consultation Document, whilst those in Tier 2 and below will be able to access the document from the SPEN consultation website shown below.

R10.2 Who to Contact?

R10.2.1 If you would like to comment on any aspect of this scheme, please contact:

Faw Side Wind Farm - Overhead Line Connection
Land and Planning,
SP Energy Networks,
55 Fullarton Drive,
Glasgow,
G32 8FA

R10.2.2 Or alternatively, please email us at:

fawsideohl@spenergynetworks.co.uk

R10.2.3 SPEN would seek comment and responses on the 'Preferred Route' described within this Routeing Consultation Document by 31 October 2020. These should be made to the addresses provided above, or at the Consultation Events detailed below.

R10.2.4 Copies of this document are also available to download at:

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

R10.2.5 Due to the Covid-19 Pandemic prevalent in the first quarter of 2020, there will be a 'Virtual Public Exhibition' explaining the process of defining the 'Preferred Route'. There will be the ability comment on the Preferred Route at this exhibition, which is available on the following website link between the 14th September and 5pm on 31st October 2020:

https://kuula.co/share/7HNvG/collection/7Ph54?fs=1&vr=1&sd=1&initload=0&thumbs=1&chromeless=1&logo=1

R11. Appendix 1: The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines with NGC 1992 and SHETL 2003 Notes Rules

R11.1 The Holford Rules

Rule 1

R11.1.1 **Avoid altogether, if possible, the major areas of highest amenity value, 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 the effect of remaining on this route must be considered in terms of the effect of a new route avoiding the area; and

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 (NPPG), Circulars and Planning Advice Notes and the spatial extent of areas identified.

R11.1.2 Examples of areas of highest amenity value which should be considered are

- Special Area of Conservation (NPPG 14);
- 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);
- Schedule of Ancient Monuments (NPPG 5);
- Listed Buildings (NPPG 18);
- Conservation Areas (NPPG 18);
- World Heritage Sites (a non-statutory designation) (NPPG 18); and
- Historic Gardens and Designed Landscapes (a non-statutory designation) (NPPG 18).

Rule 2

R11.1.3 **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) Effects on the setting of historic buildings and other cultural heritage features should be minimised; and

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

R11.1.4 **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

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

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

Rule 4

R11.1.5 **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.**

R11.1.6 Where it does not, cross directly, preferably between belts of trees.

Rule 5

R11.1.7 **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 Rules 4 and 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); and

d) Protect existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.

Rule 6

R11.1.8 **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'.**

Note on Rule 6

a) In all locations minimise confusing appearance; and

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 effects on properties and features between lines.

Rule 7

R11.1.9 **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 effects on the amenity of existing development and on proposals for new development; and

c) When siting substations take account of the effects 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

R11.1.10 The assumption made in Rule 7 is that the highest voltage line is overhead.

Supplementary Notes

a) Residential Areas

R11.1.11 Avoid routeing close to residential areas as far as possible on grounds of general amenity.

b) Designations of Regional and Local Importance

R11.1.12 Where possible choose routes which cause the least disturbance to Areas of Great Landscape Value and other similar designations of Regional or Local Importance.

c) Alternative Lattice Steel Tower Designs

R11.1.13 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 titled Overhead Transmission Line Tower Study 2004].

R11.2 Further Notes on Clarification to the Holford Rules

Line Routeing and People

R11.2.1 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 houses, farms or other small-scale settlements; and

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.

R11.3 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 effects on existing land use and rights of way;

d) Alternative designs of substations may also be considered, eg ‘enclosed’, rather than ‘open’, where additional cost can be justified;

e) Consider the relationship of towers and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints; and

f) When siting substations take account of the effects of line connections that will need to be made.

R11.4 Appendix A to the Holford Rules: 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

Interpretation of The Holford Rules 1 and 2

Introduction

R11.4.1 Rules 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.

R11.4.2 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.

Designations

R11.4.3 Since 1949, a framework of statutory measures has been developed to safeguard areas of high landscape value and nature conservation interest.

R11.4.4 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.

Amenity

R11.4.5 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.

R11.4.6 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, of 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.

Hierarchy of Amenity Value

R11.4.7 Rules 1 and 2 imply a hierarchy of amenity value from highest to high.

R11.4.8 Schedule 9 to the Act gives no indication of hierarchy of value and there is no suggestion of a hierarchy of value in either NPPG 5: 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.

Major and Smaller Areas

R11.4.9 Rules 1 and 2 imply consideration of the spatial extent of the area of amenity in the application of Rules 1 and 2.

Conclusion

R11.4.10 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.

The setting of a Scheduled Ancient Monument or a Listed Building

R11.4.11 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 of Listed Buildings.

R11.4.12 None of these documents define setting.

R11.5 Appendix B to the Holford Rules: 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

R11.5.1 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:

- 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 (NPGG 18); and
- Historic Gardens and Designed Landscapes (NPPG 18).

Other Smaller Areas of High Amenity Value

R11.5.2 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; and
- Country Parks.

R11.5.3 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.

Flora and Fauna

R11.5.4 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 Reserve.

Area of Historic, Archaeological or Architectural Value

R11.5.5 Certain designations covering more limited areas are of relevance to the protection of views and the settings of towns, villages, buildings of historic, archaeological or architectural value. These designations include features which may be of exceptional interest. Of particular importance in this connection are:

- Schedule of Ancient Monuments;
- Listed Buildings, especially Grade A and Grade B;
- Conservation Areas; and
- Gardens and Designed Landscapes included in the Inventory of Gardens and Designed Landscapes of Scotland.

Green Belts

R11.5.6 Generally the purposes of Green Belts are not directly concerned with the quality of the landscape.

R12. Appendix 2 – The Forestry Commission guidance on routeing transmission lines

R12.1.1 Route transmission lines to follow open space and to run alongside, not through, woodland.

R12.1.2 Where there is no alternative route; a power line through the forest should:

- Avoid areas of landscape sensitivity;
- Avoid the line of sight of important views;
- 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 alignment diagonal to the contour as far as possible;
- Be inflected upwards in hollows and downwards on ridges.

R12.1.3 In the design of the transmission line corridor, the transmission line within forests 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. The aim should be a corridor of varying character and width, swinging from one side of the line to the other, taking care to avoid irregular but symmetrical spaces. Exit points should be gently asymmetrical bell-mouths. Felling areas should be planned to link with and across the power line corridor and create greater irregularity.

R13. Figures Supporting this Document

R13.1.1 The following figures are provided in support of this Routeing Consultation Report.

Figure 1: Key Elements of the Grid Connection

Figure 2: Form of the Proposed Overhead Line

Figure 3: Routeing Study Area

Figure 4: Environmental Designations

Figure 5: Route Corridors Options

Figure 6: Height and Gradient Constraints (Hard) and Route Corridors

Figure 7: Elevation and Gradient Constraints (Soft) & Route Corridors

Figure 8: Landscape Character Types & Route Corridors

Figure 9: Environmental Designations & Route Corridor A

Figure 10: Environmental Designations & Route Corridor B

Figure 11: Environmental Designations & Route Corridor C

Figure 12: Environmental Designations & Route Corridor D

Figure 13: Transport Links & Route Corridors

Figure 14: Socio-Economic & Tourism Receptors & Route Corridors

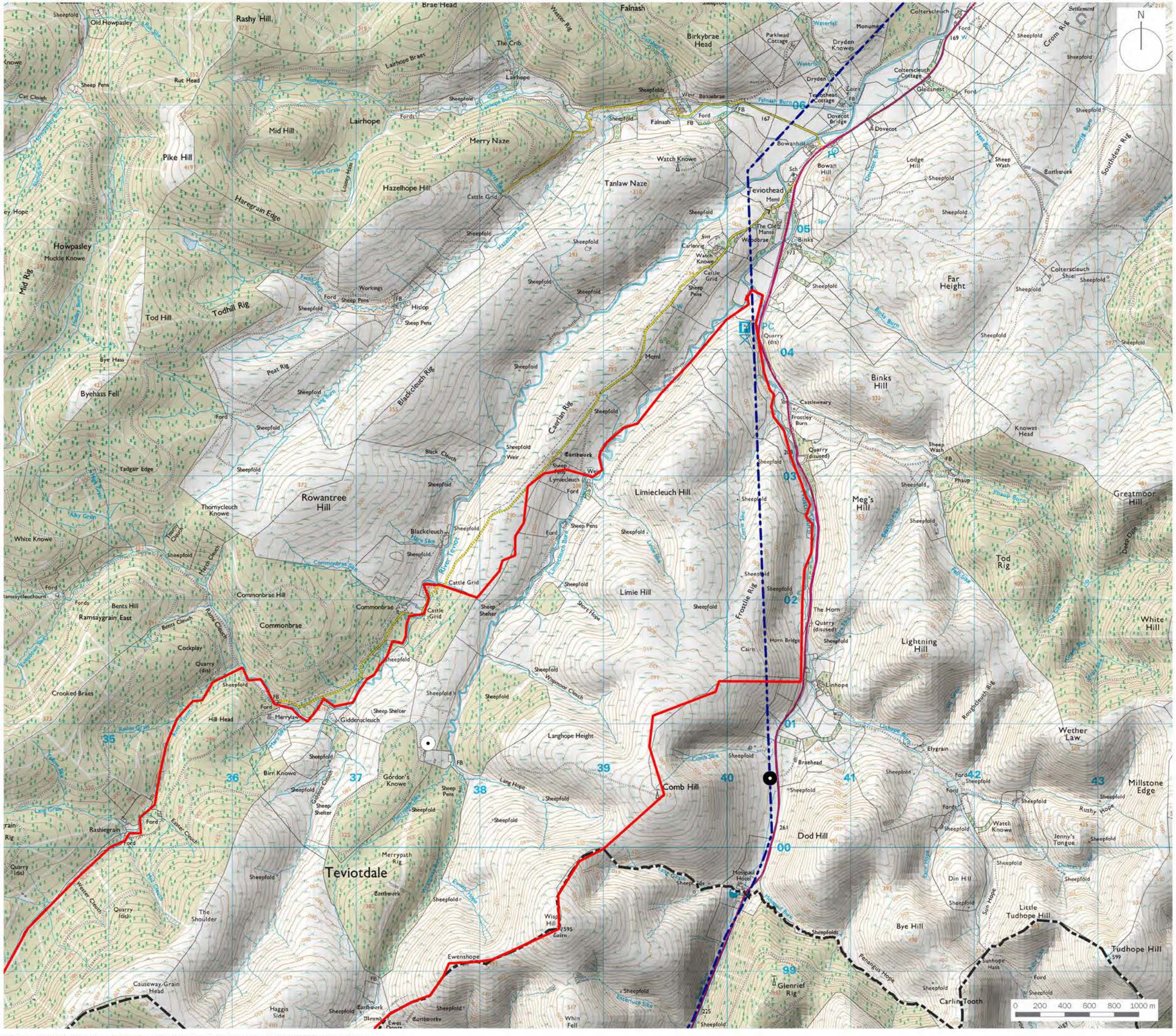
Figure 15: Superficial Geology & Route Corridors

Figure 16: Potential Lobate or Elongated Earthflow Hazards & Route Corridors

Figure 17: Solid Geology & Route Corridors

Figure 18: Hydrology Constraints & Route Corridors

Figure 19: The Preferred Route



▭ Faw Side Wind Farm Site Boundary

▭ Local Authority Boundaries

⊙ Indicative Faw Side Substation Location

-·- V Route Overhead Line (Existing)

● Tower V193

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 1: Key Elements of the Grid Connection

date	**08 JULY 2020**	drawn by	**CJM**
drawing number	**edp5122_d024a**	checked	**CJM**
scale	**1:30,000 @ A3**	QA	**JTF**

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Trident single pole, vertical insulators

Trident single pole, ‘trident’ insulators

Trident ‘H’ pole turning pole

Trident ‘H’ pole straight-line pole

Trident single and ‘H’ poles in moorland setting

Trident ‘H’ turning pole in moorland setting

Trident single and ‘H’ poles passing through forestry

Trident single poles in lowland setting with lattice towers

Trident single poles in lowland setting, with wind farm

Trident single and ‘H’ poles passing through forestry & moorland

client
SPEN

project title
Proposed 132kV Overhead Line Between Loch Urr and Kendoon

drawing title
Figure 2: Form of the Proposed Overhead Line

date	**08 JULY 2020**	drawn by	**GY**
drawing number	**edp5122_d027**	checked	**CJM**
scale	**Not to scale**	QA	**JTF**

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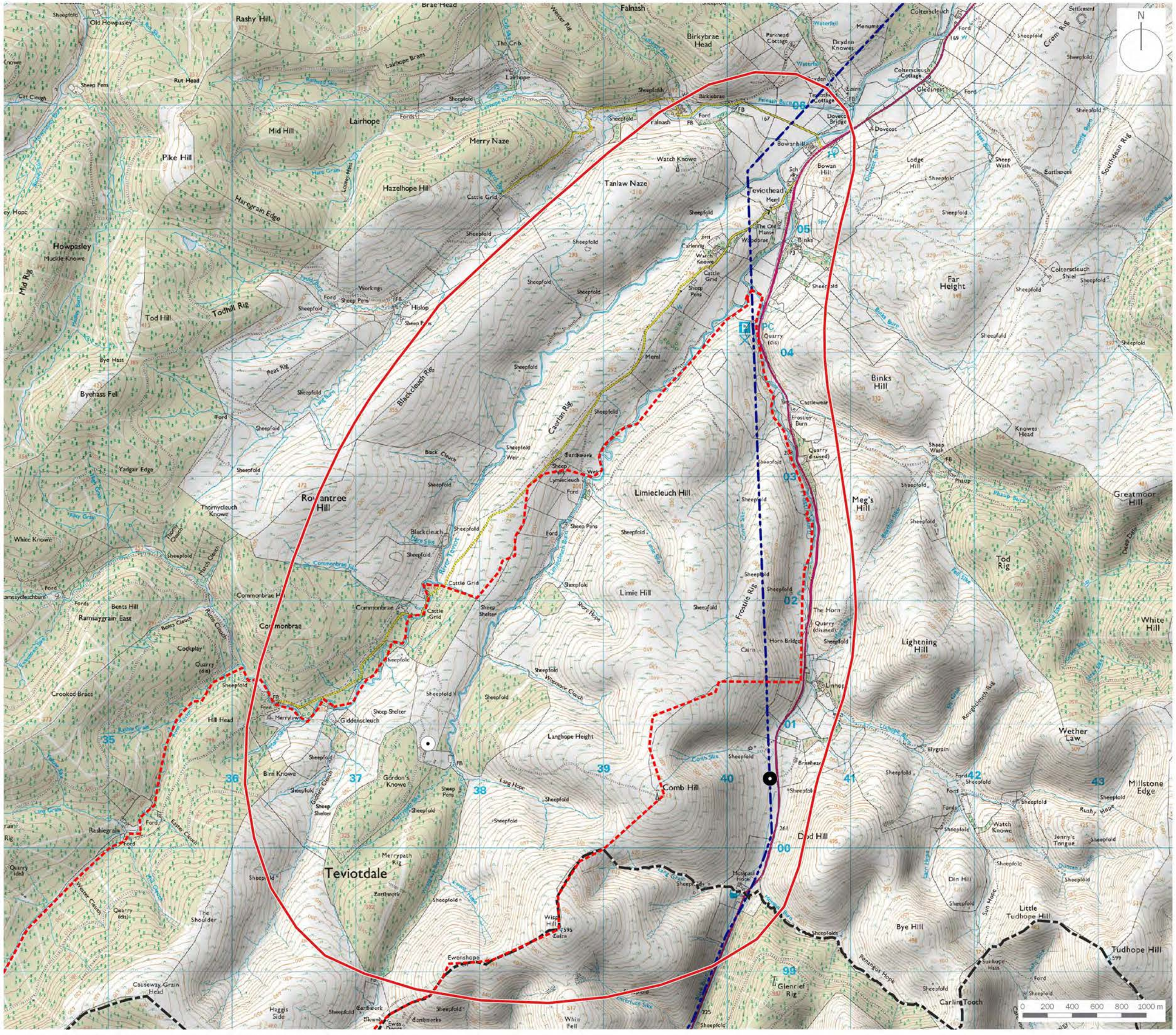

client

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project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 3: Routeing Study Area

date	08 JULY 2020	drawn by	CJM
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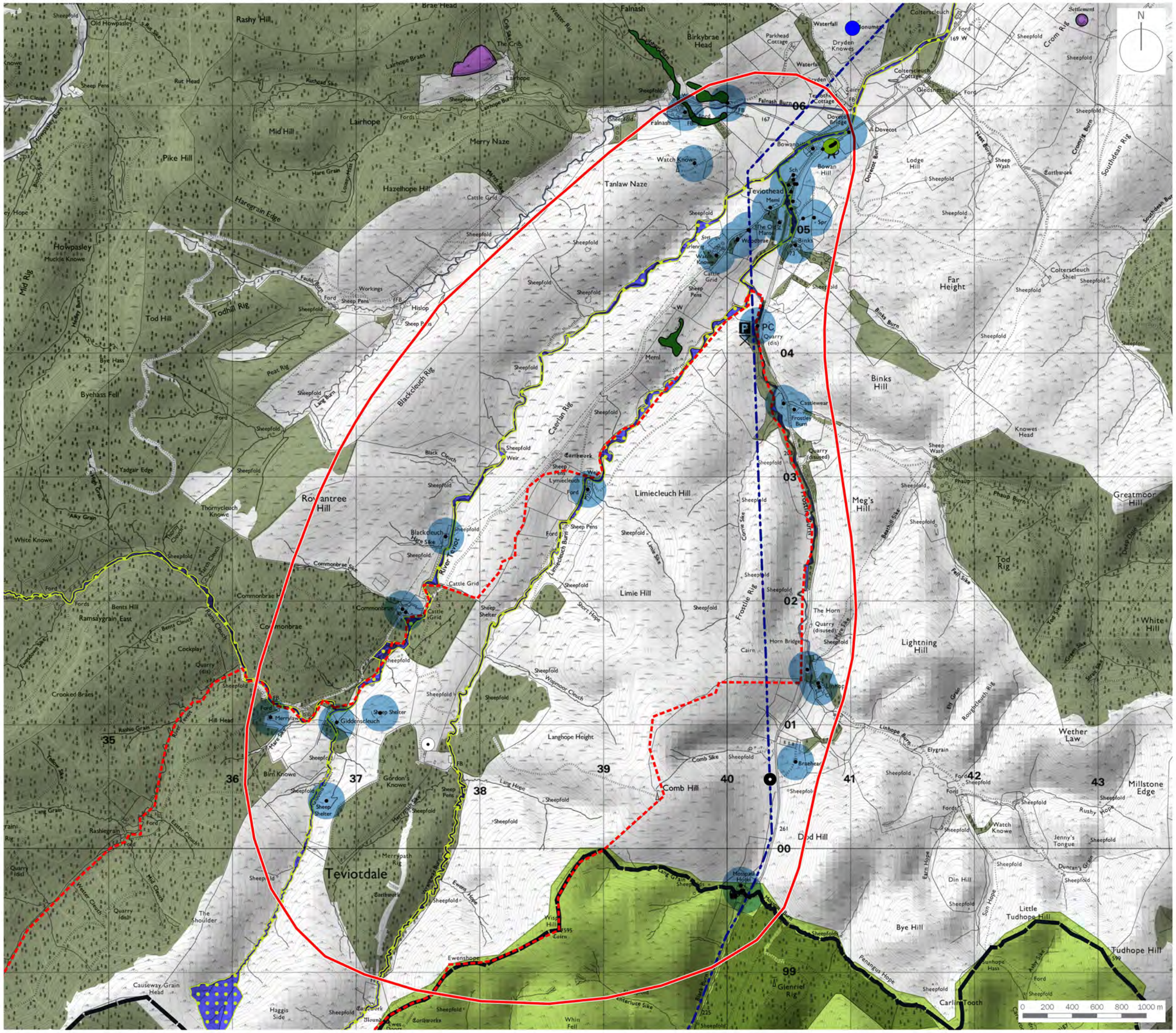

▭	Routeing Study Area
⬚	Faw Side Wind Farm Site Boundary
⊙	Indicative Faw Side Substation Location
-·-·	V Route Overhead Line (Existing)
●	Tower V193

Ecology Designations

▨	Sites of Special Scientific Interest (SSSI)
🟦	Special Areas of Conservation (SAC)
🟩	Ancient Woodland

Heritage Designations

●	Category C Listed Buildings
●	Category B Listed Buildings
🟪	Scheduled Monument

Landscape Designations

🟩	Langholm Hills RSA
🟩	National Forestry Inventory
🟦	150m Zone for Further Consideration

client
SPEN

project title
Faw Side Wind Farm Grid Connection and Substation

drawing title
Figure 4: Environmental Designations

date	08 JULY 2020	drawn by	CJM
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scale	1:30,000 @ A3	QA	JTF

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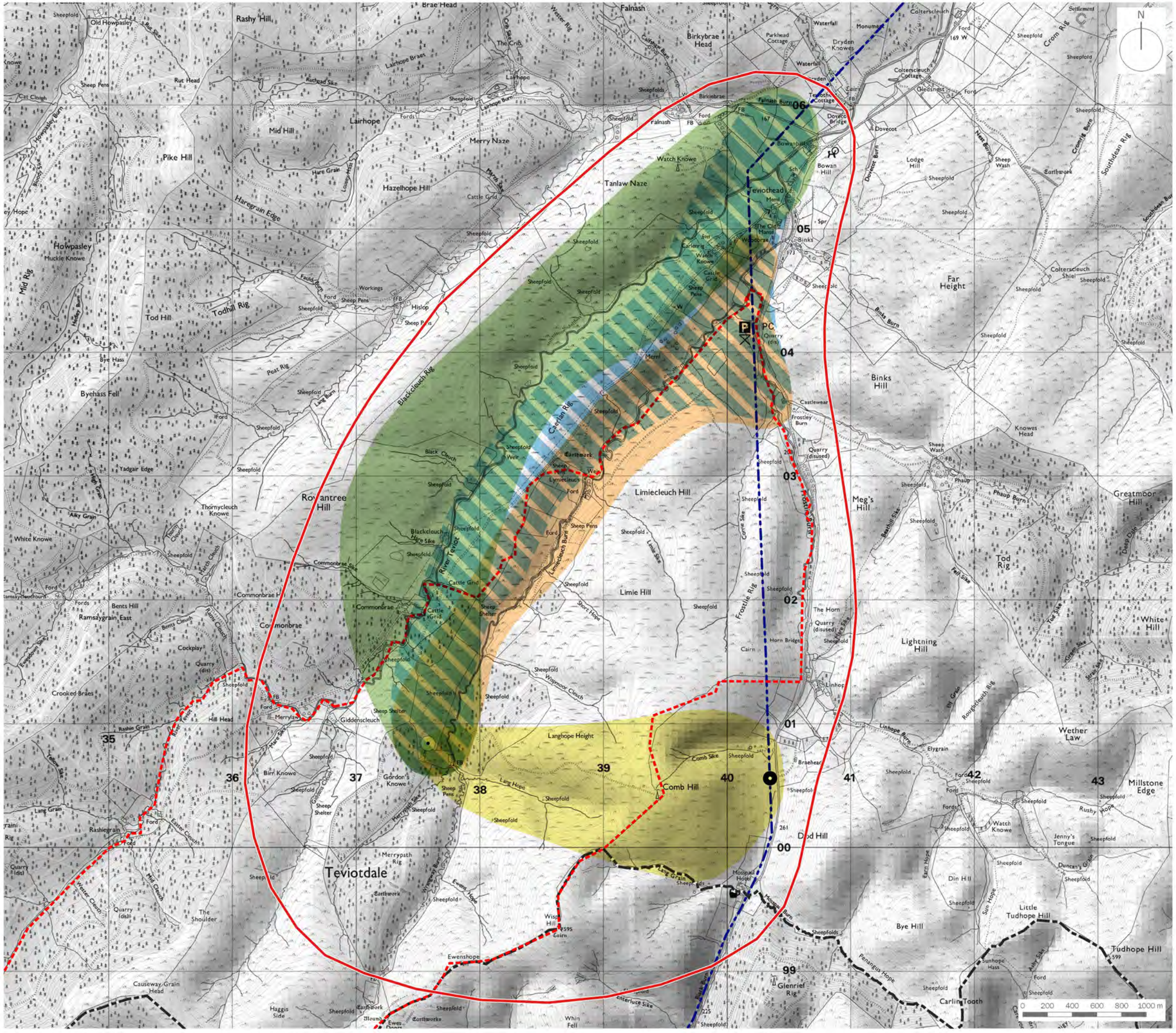

Routeing Study Area

Faw Side Wind Farm Site Boundary

Local Authority Boundaries

Indicative Faw Side Substation Location

V Route Overhead Line (Existing)

Tower V193

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 5: Route Corridor Options

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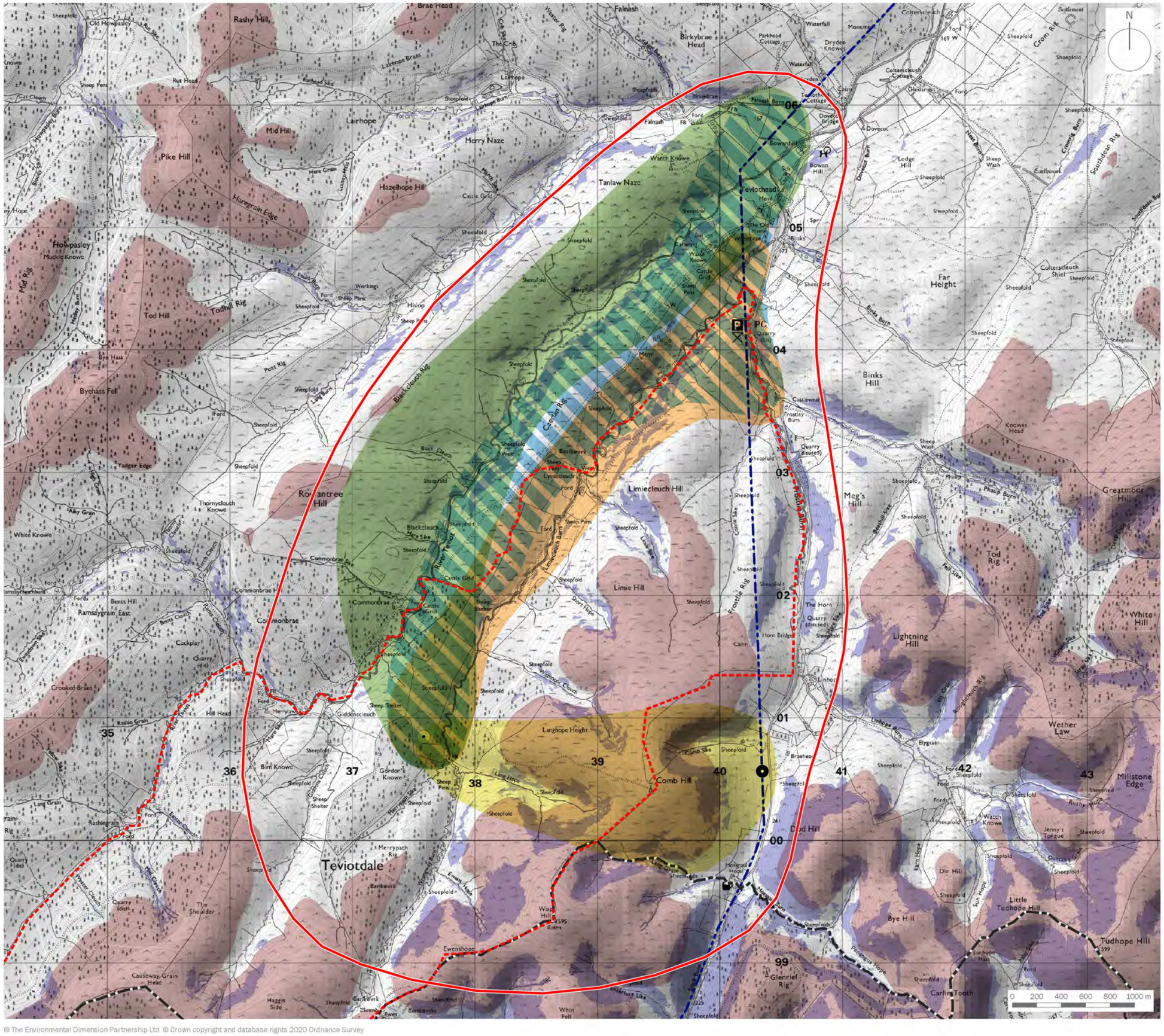

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project title

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drawing title

Figure 6: Elevation and Gradient Constraints (Hard) and Route Corridors

date	04 AUGUST 2020	drawn by	CJM
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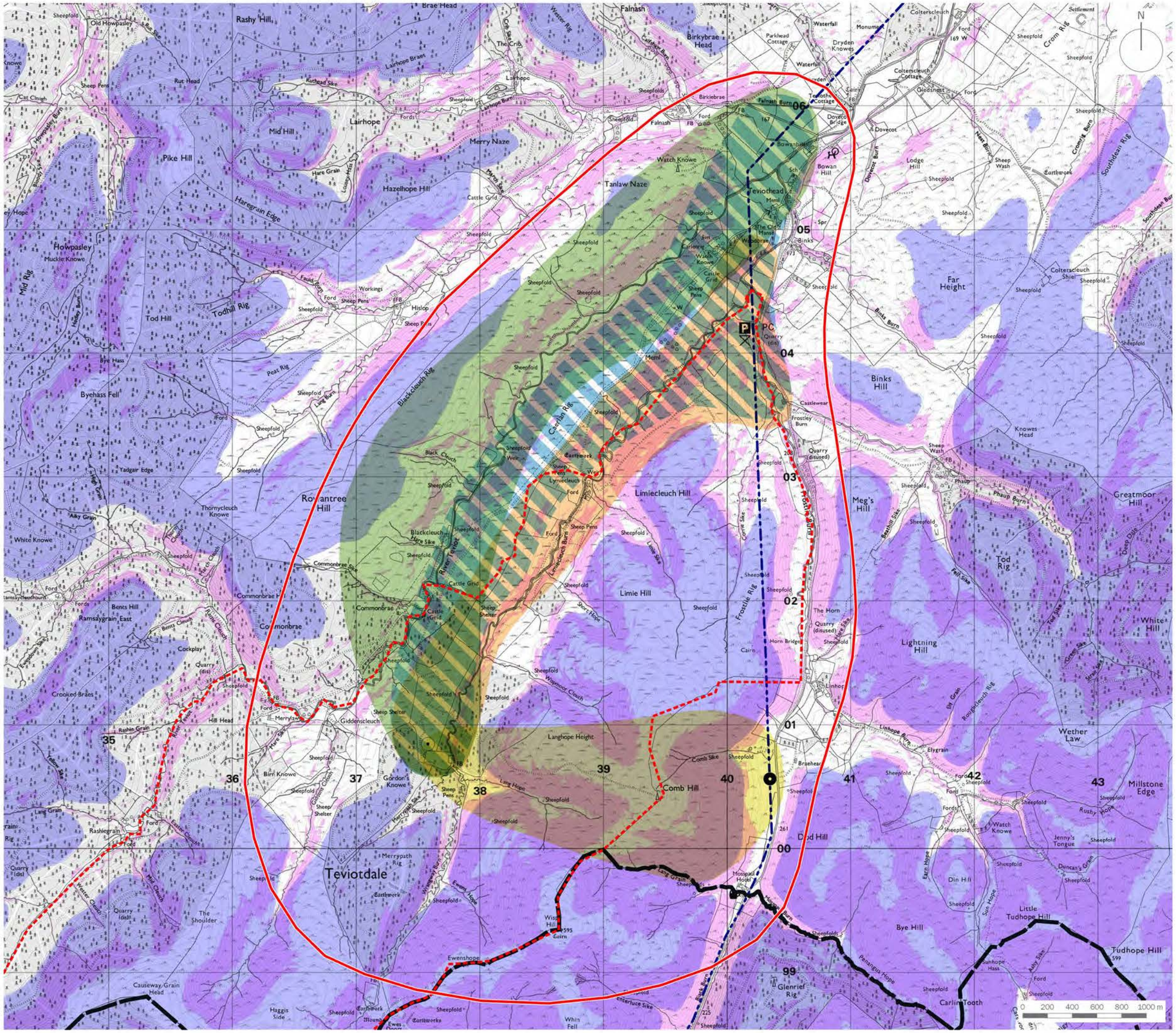

client

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project title

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drawing title

Figure 7: Elevation and Gradient Constraints (Soft) and Route Corridors

date	04 AUGUST 2020	drawn by	CJM
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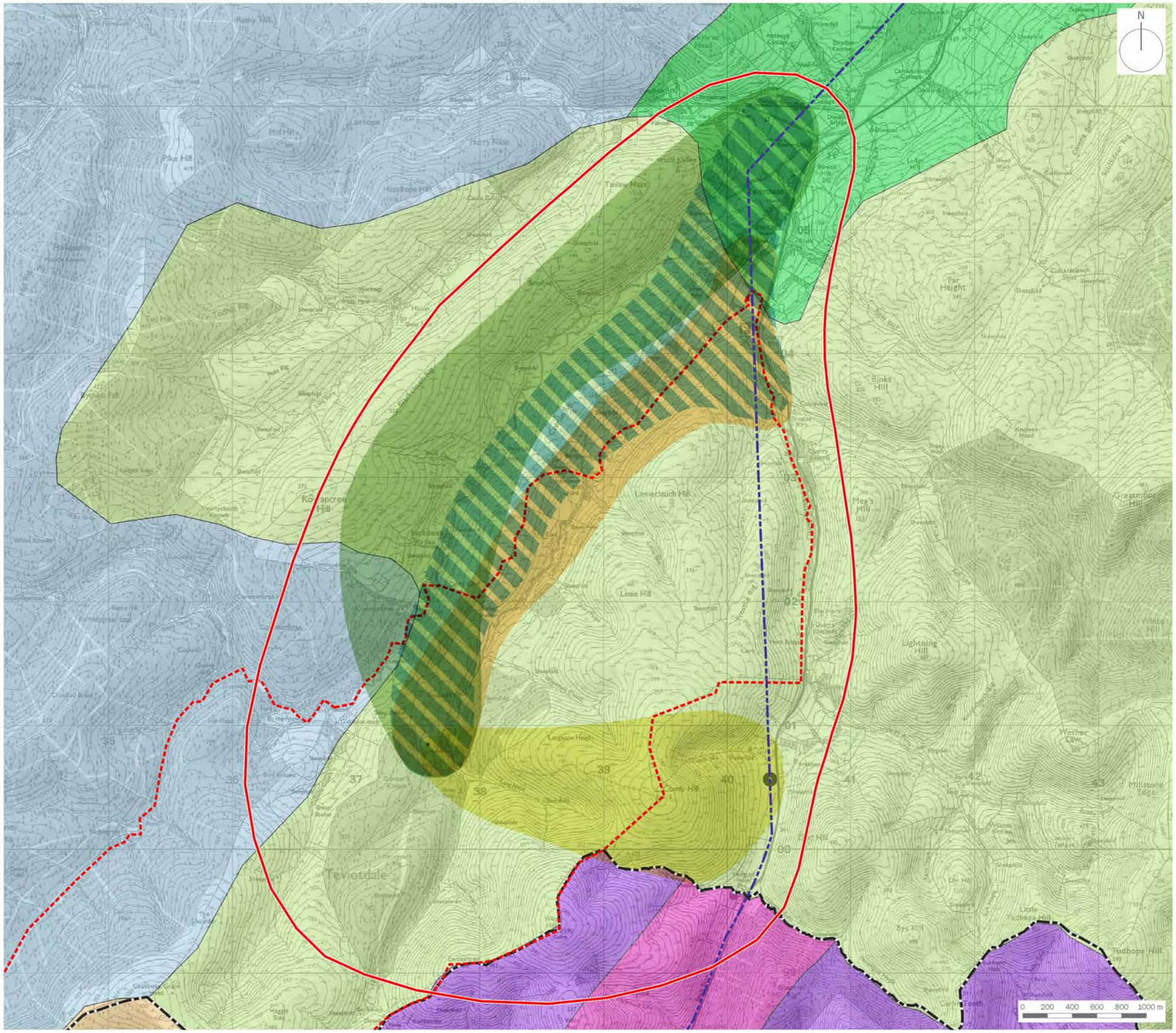

Routeing Study Area

Faw Side Wind Farm Site Boundary

Local Authority Boundaries

V Route Overhead Line (Existing)

Tower V193

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

Landscape Character Areas

LCT117 Pastoral Upland Fringe Valley

LCT177 Southern Uplands - D&G

LCT96 Southern Uplands with Forest - Borders

LCT93 Southern Uplands with Scattered Forest - Borders

LCT166 Upland Glens - D&G

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 8: Landscape Character Types and Route Corridors

date	**08 JULY 2020**	drawn by	**MH**
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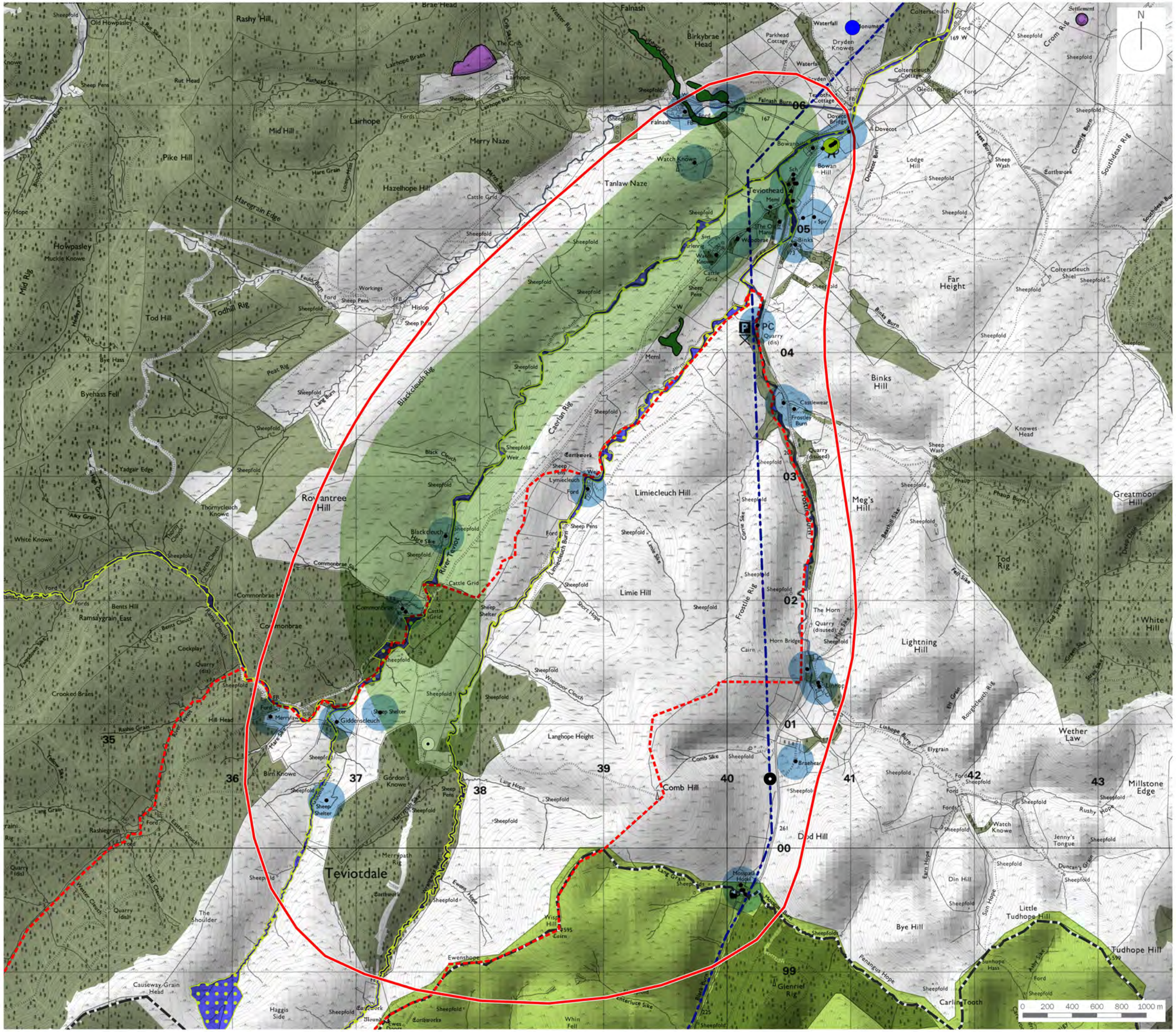

Routeing Study Area

Faw Side Site Boundary

Indicative Faw Side Substation Location

V Route Overhead Line (Existing)

Tower V193

Ecology Designations

Sites of Special Scientific Interest (SSSI)

Special Areas of Conservation (SAC)

Ancient Woodland

Heritage Designations

Category C Listed Buildings

Category B Listed Buildings

Scheduled Monument

Landscape

Langholm Hills RSA

National Forestry Inventory

Residential Dwellings

150m Zone for Further Consideration

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 9: Environmental Designations & Route Corridor A

date	**08 JULY 2020**	drawn by	**CJM**
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Routeing Study Area

Faw Side Site Boundary

Indicative Faw Side Substation Location

V Route Overhead Line (Existing)

Tower V193

Ecology Designations

Sites of Special Scientific Interest (SSSI)

Special Areas of Conservation (SAC)

Ancient Woodland

Heritage Designations

Category C Listed Buildings

Category B Listed Buildings

Scheduled Monument

Landscape Designations

Langholm Hills RSA

National Forestry Inventory

Residential Dwellings

150 Zone for Further Consideration

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 10: Environmental Designations & Route Corridor B

date	**08 JULY 2020**	drawn by	**CJM**
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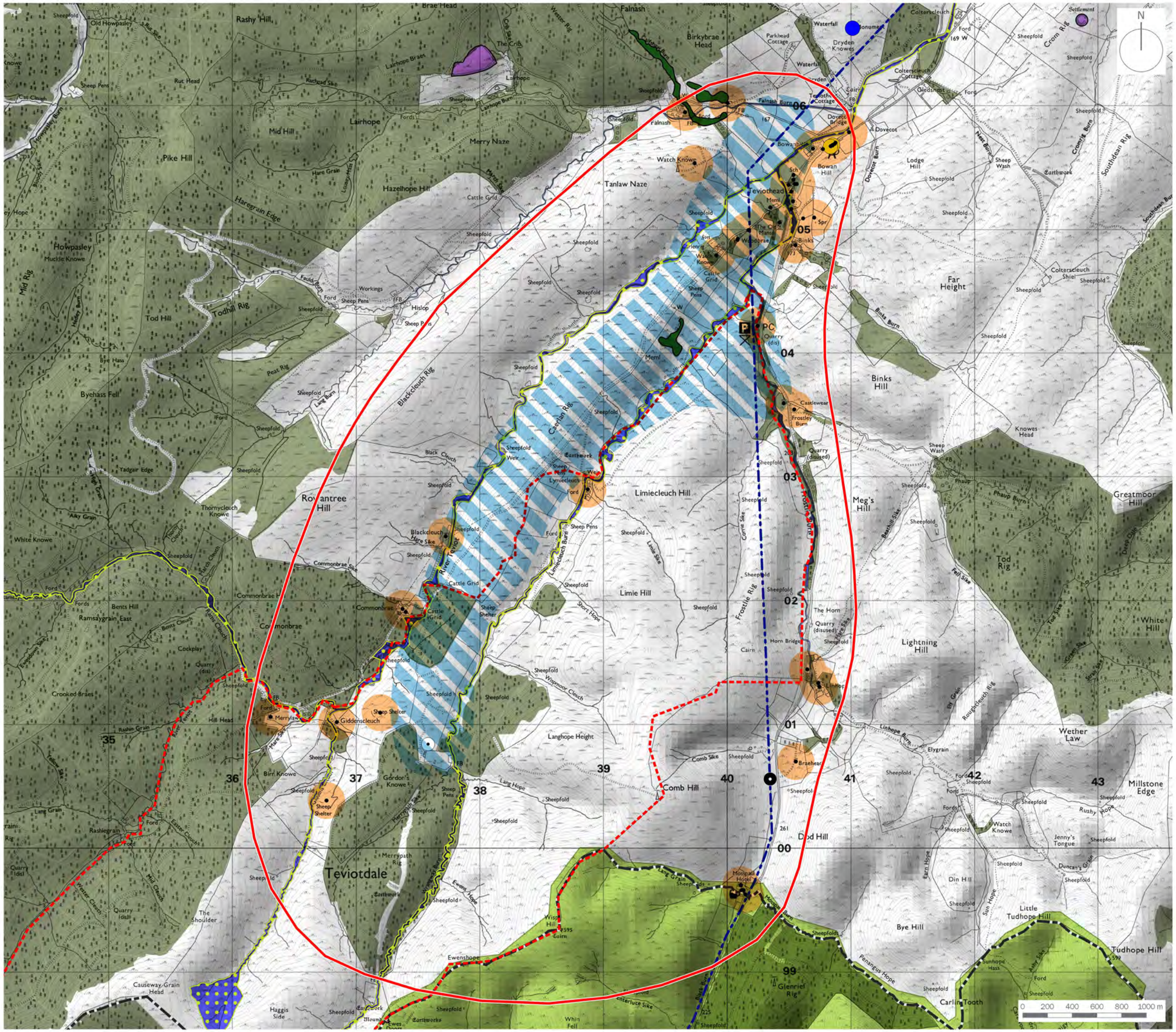

▭ Routeing Study Area

⬚ Faw Side Wind Farm Site Boundary

⊙ Indicative Faw Side Substation Location

-·-· V Route Overhead Line (Existing)

● Tower V193

Ecology Designations

▨ Sites of Special Scientific Interest (SSSI)

🟦 Special Areas of Conservation (SAC)

🟩 Ancient Woodland

Heritage Designations

● Category C Listed Buildings

● Category B Listed Buildings

🟪 Scheduled Monument

Landscape Designations

🟩 Langholm Hills RSA

🟩 National Forestry Inventory

• Residential Dwellings

🟧 150m Zone for Further Consideration

client
SPEN

project title
Faw Side Wind Farm Grid Connection and Substation

drawing title
Figure 11: Environmental Designations & Route Corridor C

date	08 JULY 2020	drawn by	CJM
drawing number	edp5122_d014a	checked	CJM
scale	1:30,000 @ A3	QA	JTF

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Routeing Study Area

Faw Side Wind Farm Site Boundary

Indicative Faw Side Substation Location

V Route Overhead Line (Existing)

Tower V193

Ecology Designations

Sites of Special Scientific Interest (SSSI)

Special Areas of Conservation (SAC)

Ancient Woodland

Heritage Designations

Category C Listed Buildings

Category B Listed Buildings

Scheduled Monument

Landscape

Langholm Hills RSA

National Forestry Inventory

Residential Dwellings

150m Zone for Further Consideration

client

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project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 12: Environmental Designations & Route Corridor D

date	**08 JULY 2020**	drawn by	**CJM**
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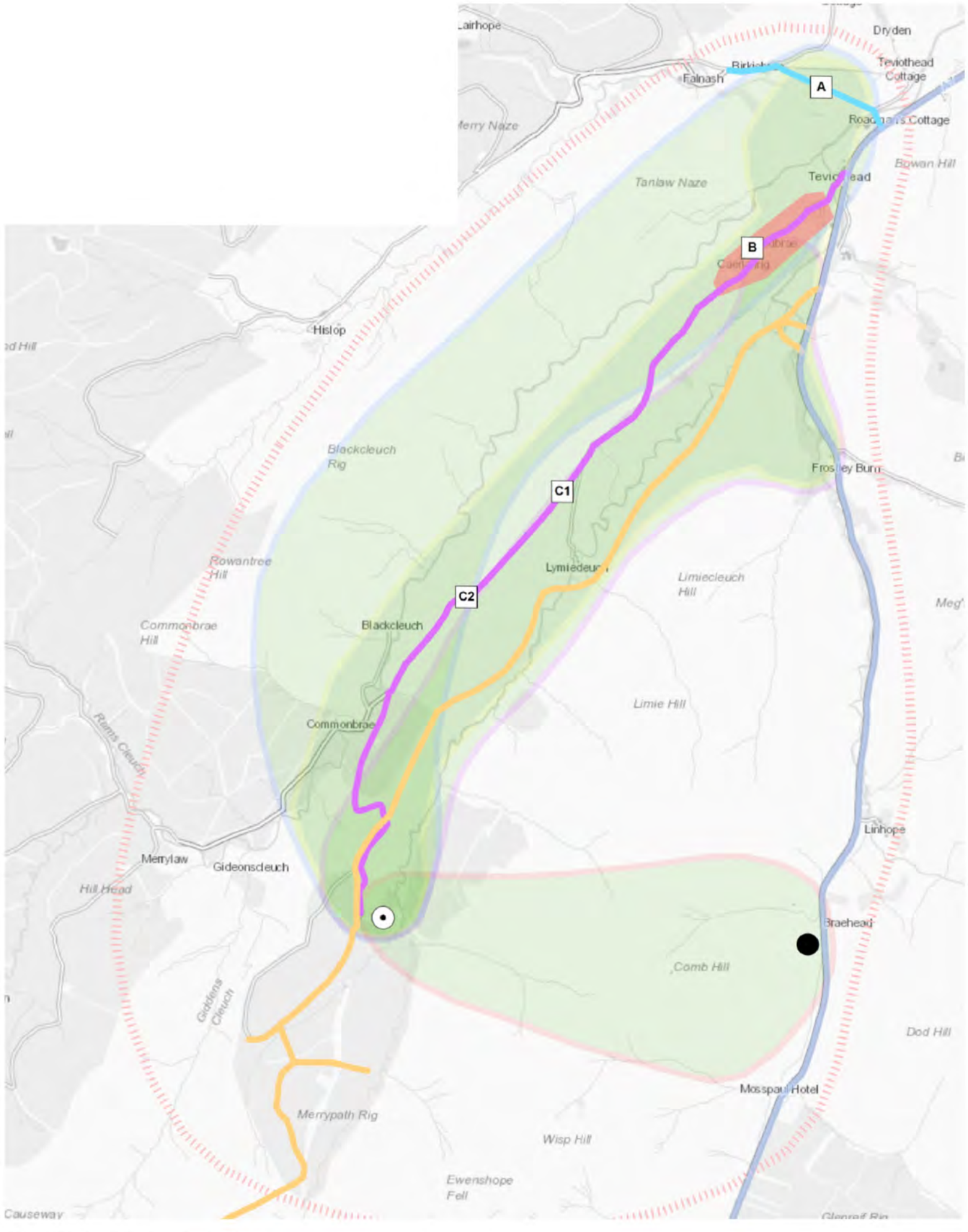

N

- Route Corridor A
- Route Corridor B
- Route Corridor C
- Route Corridor D
- Sensitive Receptors
- A — Photo Point
- Tower V193
- Substation Location 080419
- A7 Trunk Road
- Proposed Windfarm Access Tracks & Junctions
- Fallnash Burn Road
- Caerlan Rig Road
- Routeing Study Area

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Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 13: Transport Links & Route Corridors

date	**04 AUGUST 2020**	drawn by	**MH**
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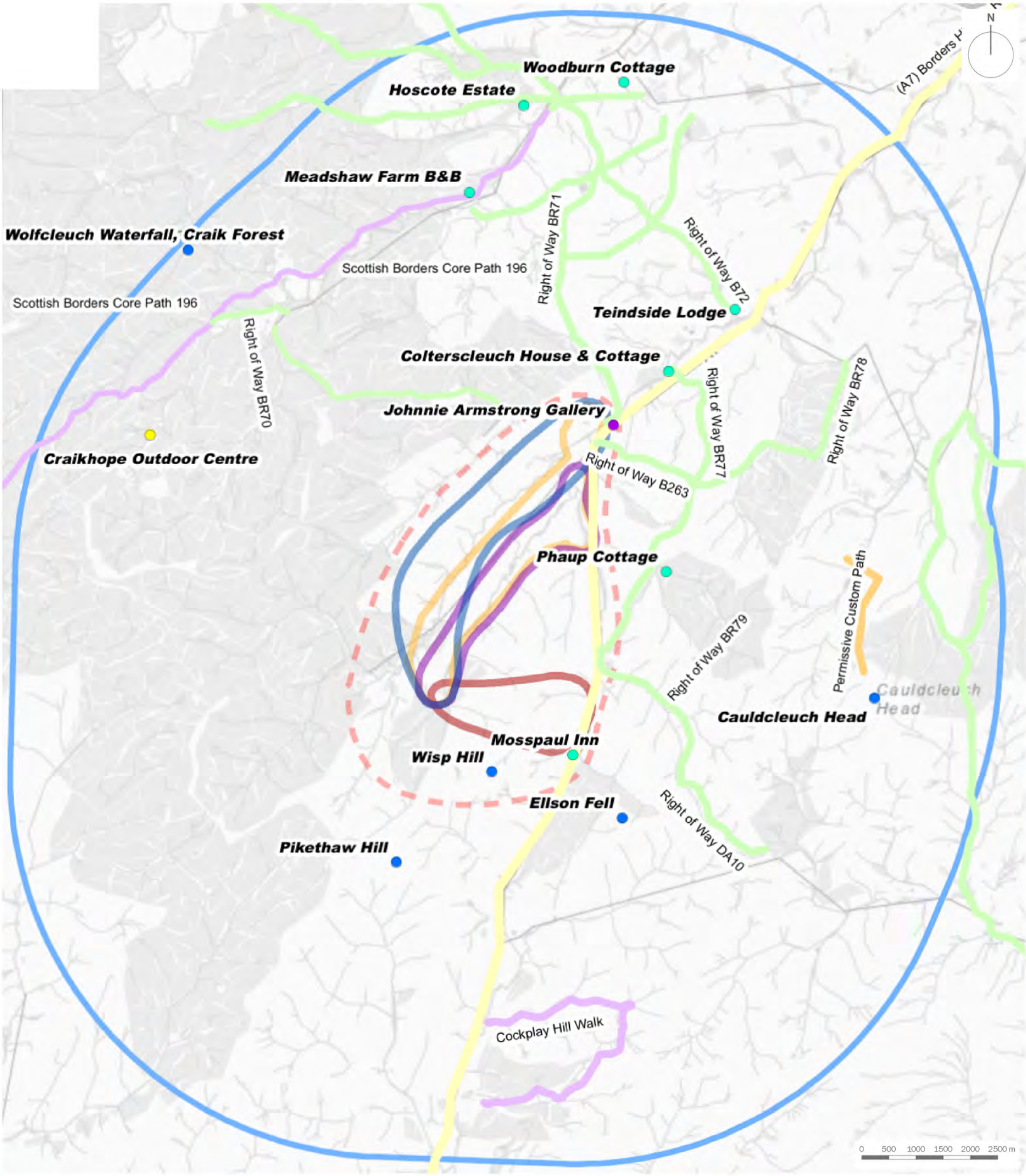

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date	04 AUGUST 2020
drawing number	edp5122_d021b
scale	Refer to scale bar @ A3
drawn by	MH
checked	CJM
QA	JTF

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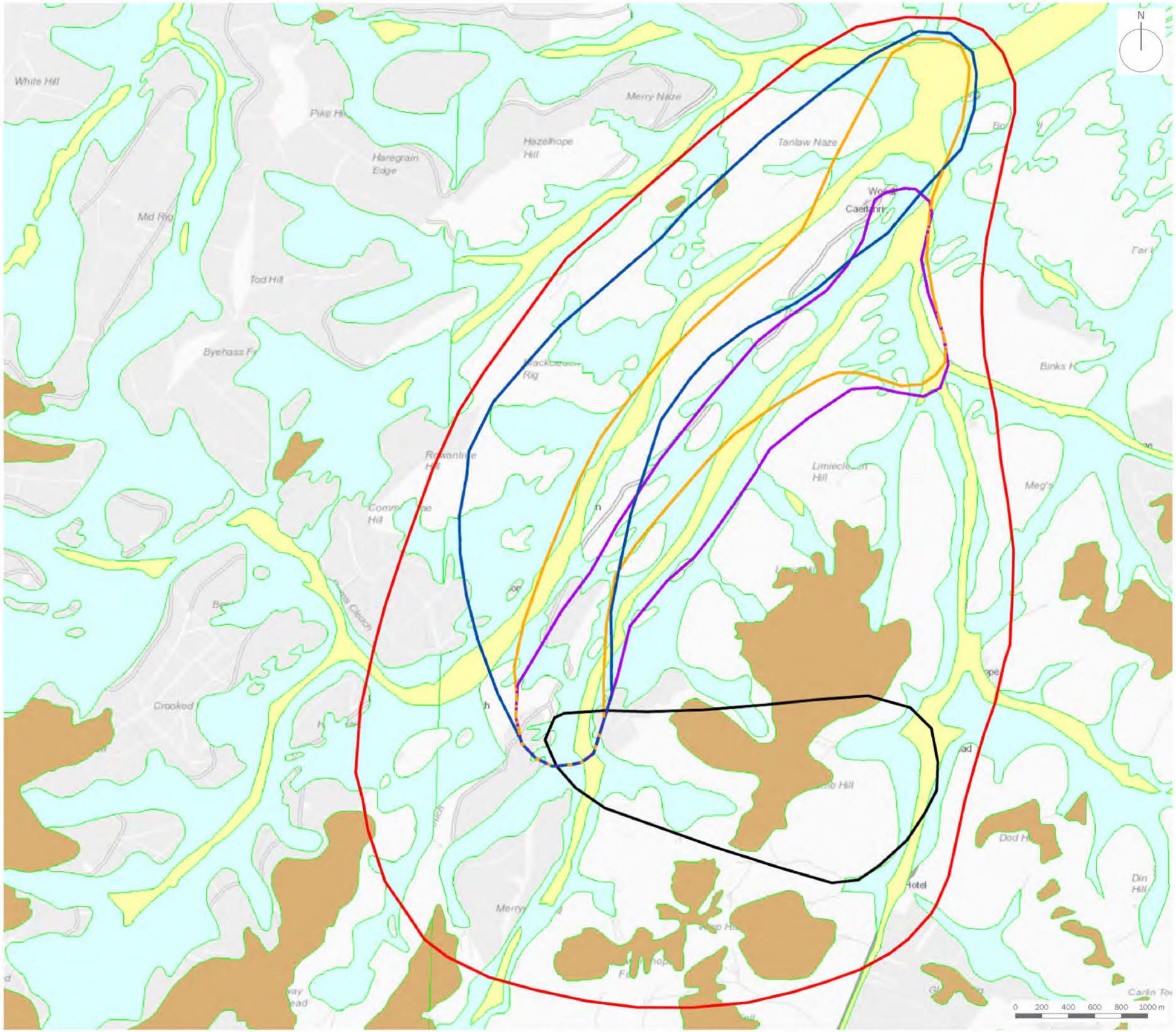
project title
Faw Side Wind Farm Grid Connection and Substation

drawing title
Figure 14: Socio-economic & Tourism Receptors



Routeing Study Area

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

Superficial Geology

Alluvium - Silt, Sand and Gravel

Till, Devensian - Diamicton

Peat - Peat

No Record

client

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project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 15: Superficial Geology & Route Corridors

date	**04 AUGUST 2020**	drawn by	**MH**
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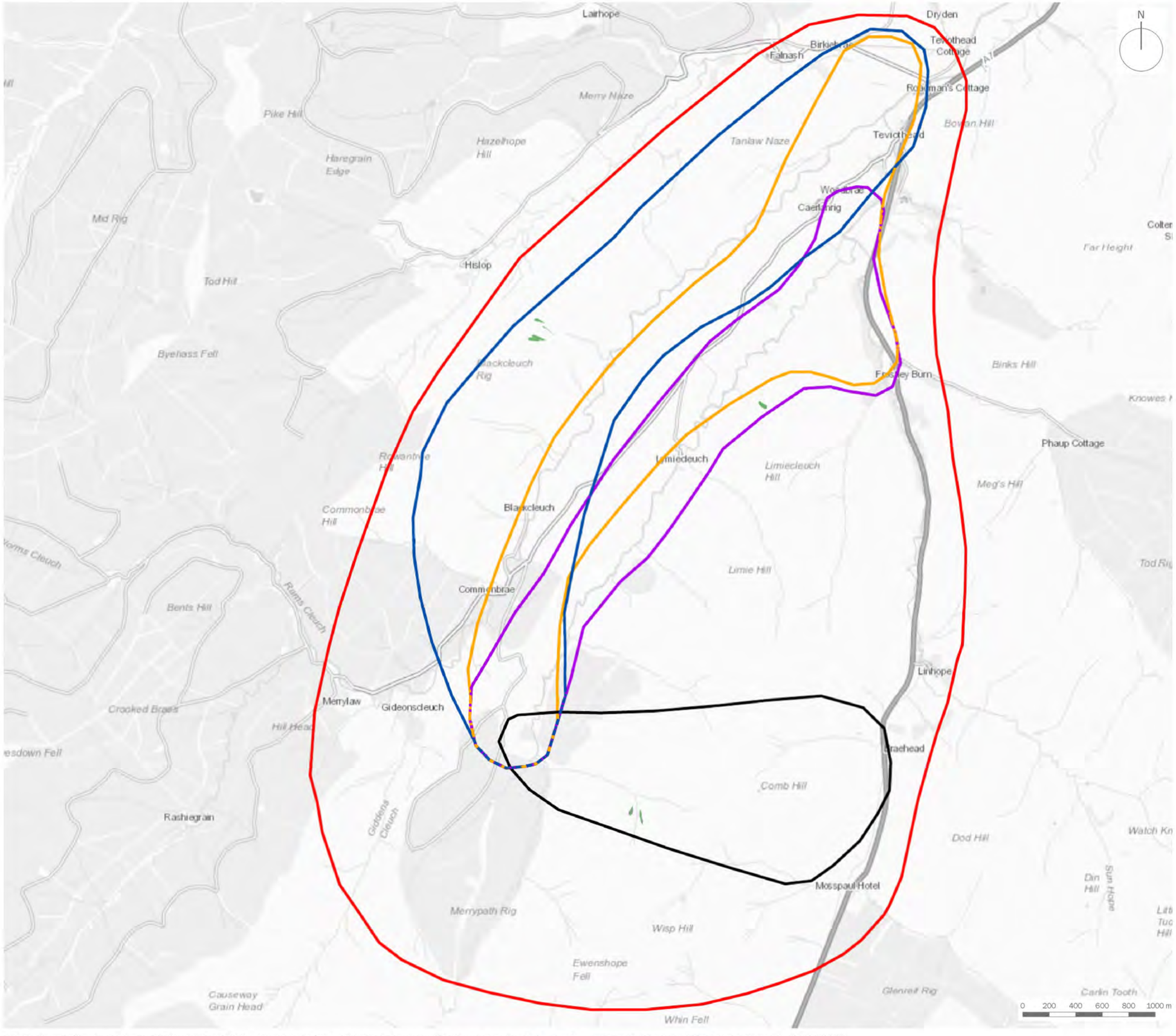

Routeing Study Area

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

Potential Lobate/Elongated Earthflow Hazard

client

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project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 16: Potential Lobate or Elongated Earthflow Hazards & Route Corridors

date	**04 AUGUST 2020**	drawn by	**MH**
drawing number	**edp5122_d017b**	checked	**CJM**
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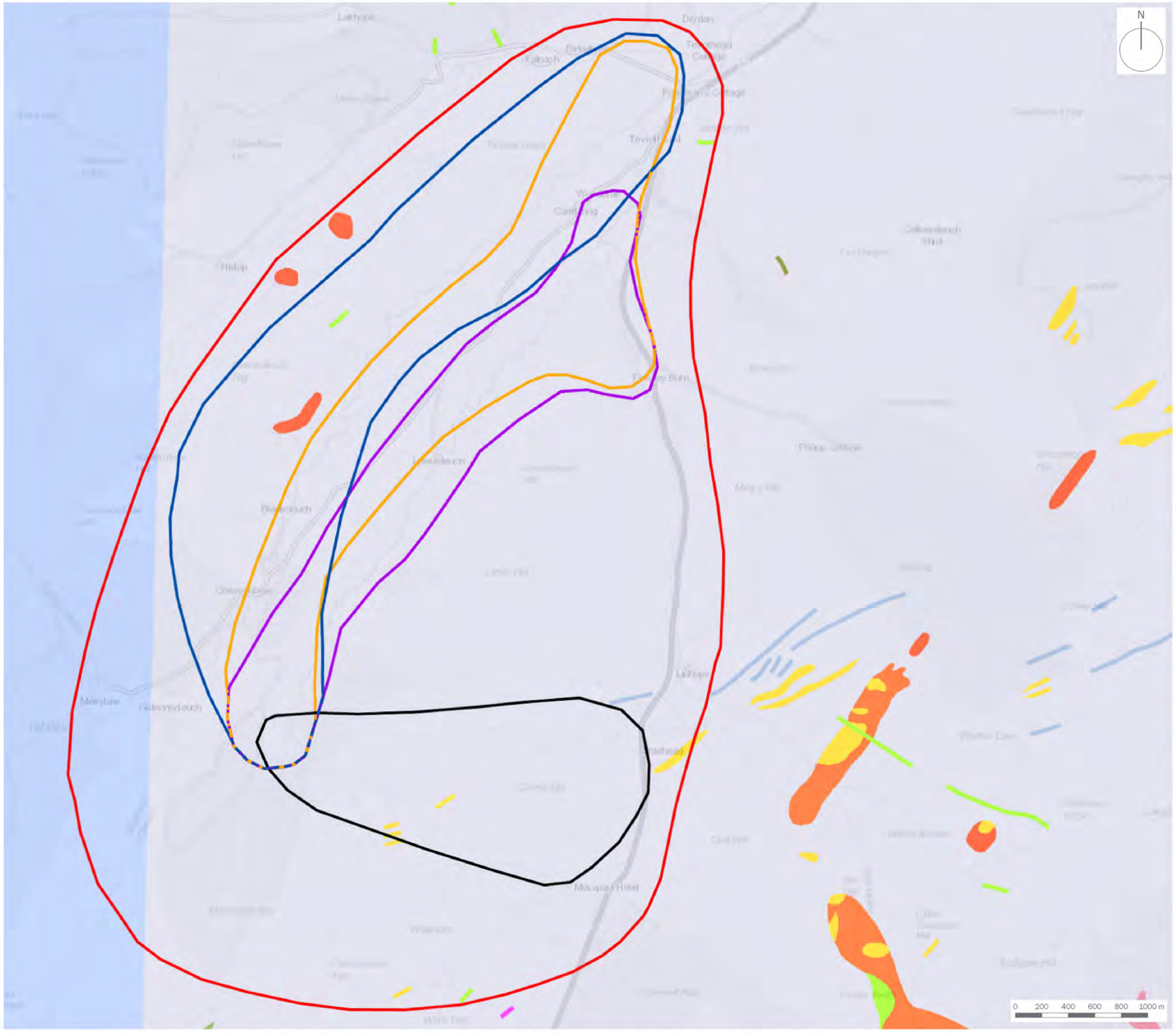

Routeing Study Area

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

Solid Geology

Southern Scotland Dinantian Plugs and Vents Suite - Agglomerate

Carghidown Formation - Metasandstone and Metamudstone

Hawick Group - Wacke

Ross Group - Metasandstone and Metamudstone

Ricarton Group - Mudstone

Southern Scotland Dinantian Plugs and Vents Suite - Trachyte

Southern Scotland Dinantian Plugs and Vents Suite - Phonolite

Carewoodrig Vent - Agglomerate

Carewoodrig Vent - Phonolite

Statheden Group and Iverclyde Group Sandstone and Argilaceous Rocks Interbedded

Southern Scotland and Dinantian Plugs and Vent Suits - Microgabbro Plagioclase-microphyric

Mull Dyke-swarm - Microgabbro

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project title

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drawing title

Figure 17: Solid Geology & Route Corridors

date	**04 AUGUST 2020**	drawn by	**MH**
drawing number	**edp5122_d018b**	checked	**CJM**
scale	**Refer to scale bar @ A3**	QA	**JTF**

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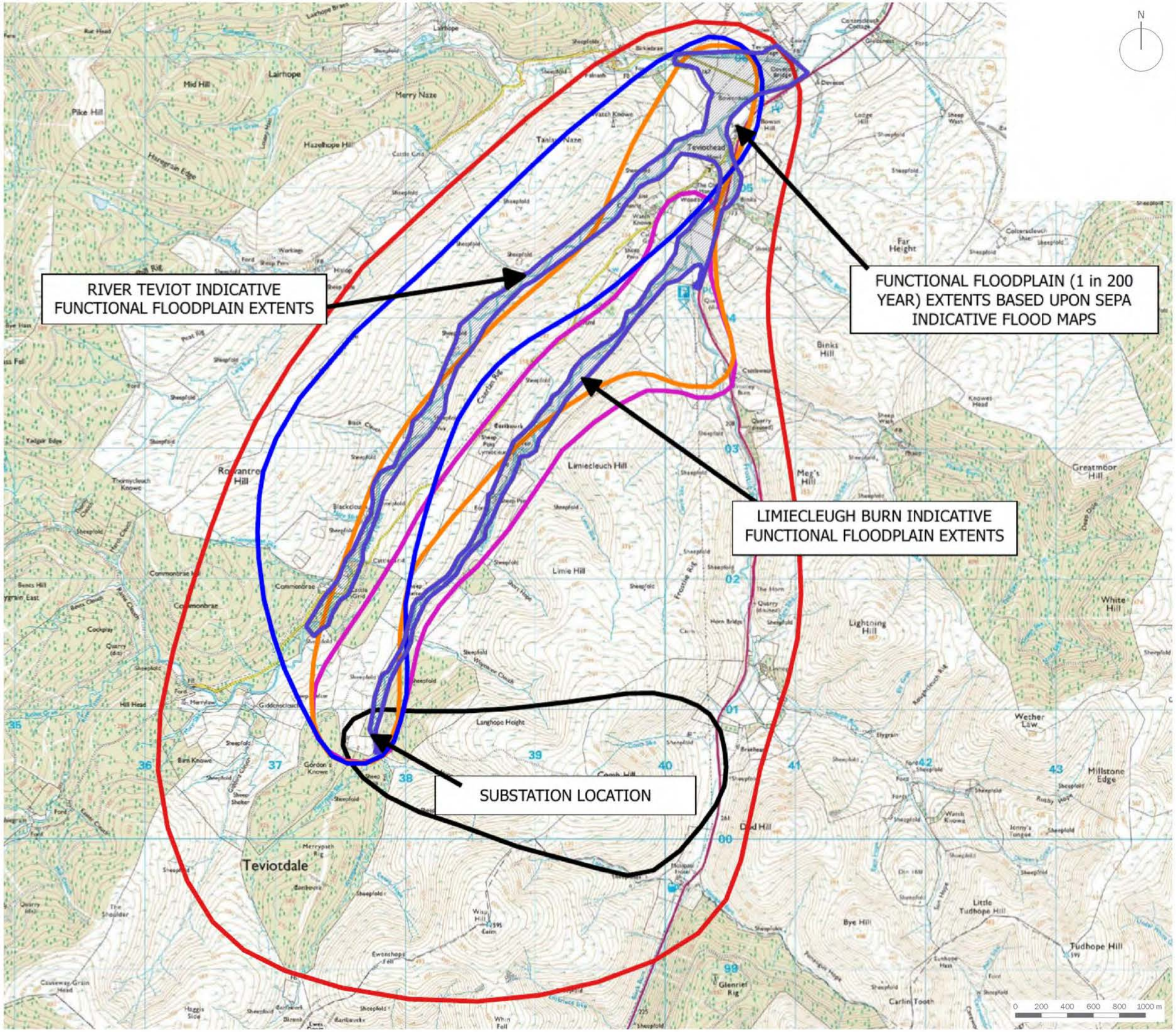

Routeing Study Area

Route Corridor A

Route Corridor B

Route Corridor C

Route Corridor D

Floodplain Extents Indicative 1 in 200 Year

client

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project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 18: Hydrology Constraints & Route Corridors

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drawing number	edp5122_d020b	checked	CJM
scale	Refer to scale bar @ A3	QA	JTF

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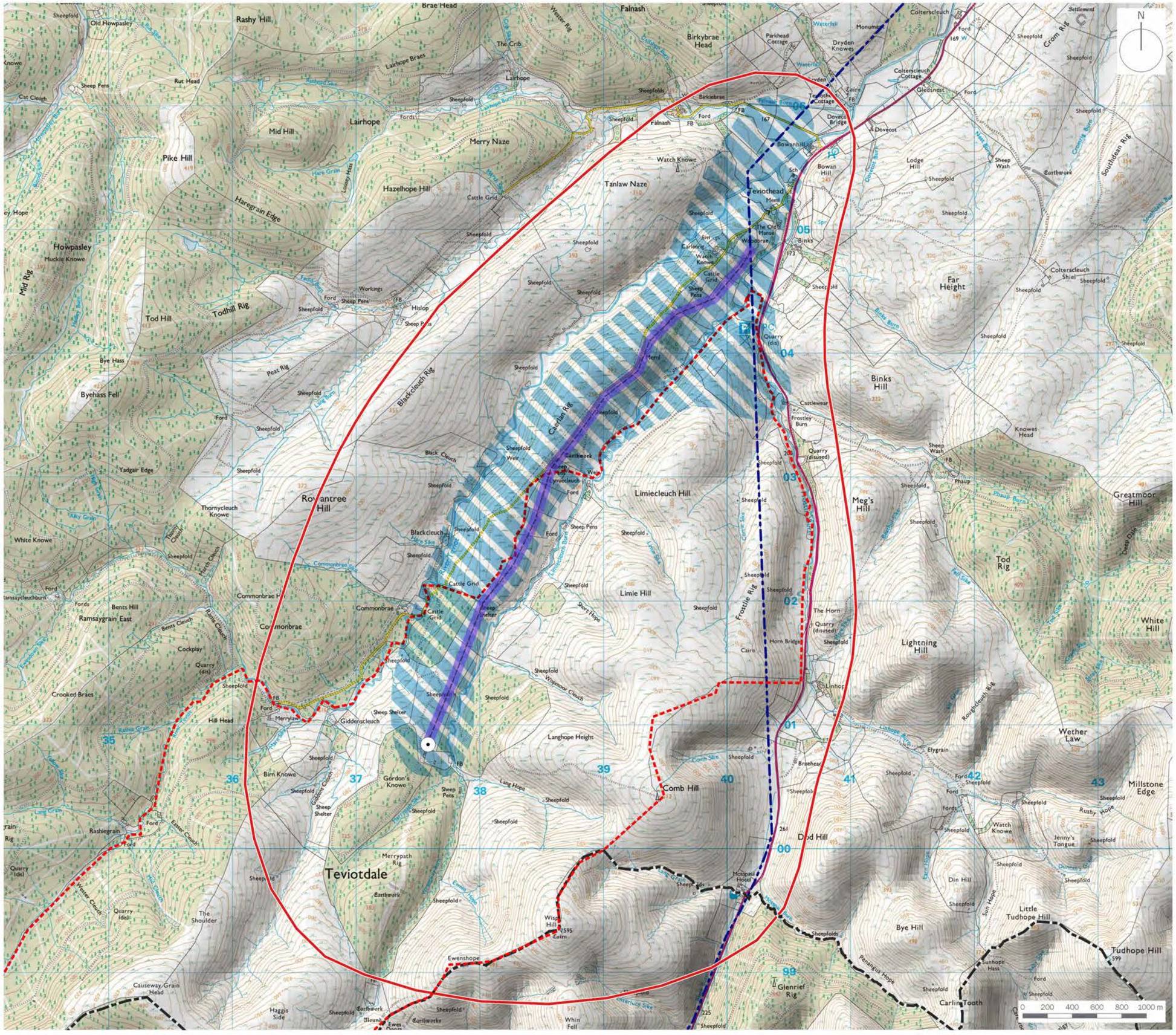

Routeing Study Area

Faw Side Wind Farm Site Boundary

Local Authority Boundaries

V Route Overhead Line (Existing)

Indicative Faw Side Substation Location

The Preferred Route

The Preferred Route Corridor

client

SPEN

project title

Faw Side Wind Farm Grid Connection and Substation

drawing title

Figure 19: The Preferred Route

date	**08 JULY 2020**	drawn by	**CJM**
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scale	**1:30,000 @ A3**	QA	**JTF**

the environmental dimension partnership

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Drawing Reference: edp5122_d036